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PROGRAM ABSTRACT BOOK

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2025 World Congress on Health Economics

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Saturday

9:00 AM –5:00 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Hibiscus

Open Source Approaches to Economic Evaluation in Low- and Middle-Income Country Contexts

9:00 AM –5:00 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Magnolia

Looking Beyond the Patient: Evaluating the Broader Costs and Impacts of Infectious Disease Interventions

9:00 AM –5:00 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Frangipani

Priorities in Immunization Economics: Reaching Zero-Dose Children and Missed Communities; Sustainability, Prioritization and Optimization. Day 1

9:00 AM –12:30 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Bougainville

Accelerating and Sustaining the Journey Towards Universal Health Coverage (UHC) Through Peer-to-Peer Learning Approach

9:00 AM –5:00 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Orchid

Improving Financial Protection in Health: Strengthening the Evidence to Policy Pipeline

10:00 AM –12:00 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Lotus

Recalibrating Post-Pandemic Fiscal Health: Fiscal Policy, Health Financing, and Sustainable Recovery in Asia and the Pacific

11:00 AM –1:00 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Jasmine

Assessing Health Utilities of Temporary Health States in Children — Navigating Global Challenges

12:00 PM –5:00 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Nusantara 1

Early-Career Researcher Pre-Congress Session

DISCUSSANT: **John Ele-Ojo Ataguba**, University of Manitoba; **Manuela De Allegri**, University of Heidelberg; **Sally Stearns**, The University of North Carolina; **Nhung Nghiem**, "John Curtin School of Medical Research, Australian National University"; **Stirling Bryan**, University of British Columbia

Revising Benefit Package for Nepal's National Health Insurance: Challenges and Considerations

PRESENTER: **Suvekshya Tiwari**

Background: Health benefit package revision is a crucial component of ensuring equitable and cost-effective healthcare coverage, particularly in low- and middle-income countries (LMICs) like Nepal. The Health Insurance Board (HIB) of Nepal introduced its initial benefit package in 2017 using an input-based approach and a fee-for-service (FFS) payment model. A partial revision in 2021 updated the rates for 104 medical, surgical, and radiological services, along with 69 medicines. However, the system still faces major inefficiencies, prompting a full-scale revision initiated in May 2023.

Objectives: The study assesses challenges in revising Nepal's health insurance benefit package and guide the development of standardized, cost-effective and sustainable health services.

Data and methods: This study employs a mixed-methods approach, combining micro-costing analysis, claims data evaluation and stakeholder consultations to assess inefficiencies in Nepal's health insurance benefit package. Quantitative analysis will examine cost variations, utilization trends and financial sustainability while qualitative insights from policymakers, providers, and patients will identify challenges and improvement areas. Results The ongoing revision integrates an input-based and analytical approach, with service rates determined through a micro-costing methodology. The total cost for each surgical package now includes anesthesia, laboratory, radiology, physiotherapy, procedure, medicine, and consumable charges. Medicine pricing follows a market assessment, applying a 15% reduction to the mean maximum retail price (MRP), as recommended by the Department of Drug Administration (DDA). Additionally, a tiered benefit structure is under consideration, classifying healthcare facilities into five levels (primary care centers to super-specialized hospitals) and implementing a 10% co-payment for selected services. Despite these improvements, several challenges persist. The absence of standardized service rates leads to significant price variations across hospitals, with the cost of an Albumin test ranging from NPR 400 to NPR 1,200 in Kathmandu, highlighting inefficiencies in cost regulation. Resource constraints, both financial and human, have limited the ability to ensure comprehensive coverage of essential treatments and medicines. Additionally, the fee-for-service payment model, adopted without prior piloting, has resulted in inefficiencies and excessive reliance on provider-determined rates, making the system less cost-effective.

Conclusions: To overcome these challenges, several strategies have been proposed. Conducting regular assessments of the healthcare landscape will help monitor emerging medical technologies and cost trends, ensuring that the benefit package remains relevant. In-depth analysis of claims data, utilization patterns, and cost trends will enable the exploration of alternative payment models such as Diagnosis-Related Groups (DRG), capitation, or pay-for-performance (P4P). Implementing a tiered benefit structure will optimize resource allocation by differentiating coverage levels based on healthcare facility types. Additionally, performing cost-benefit analyses before incorporating new treatments will enhance financial sustainability. Establishing a continuous feedback loop involving service providers and insurers will further support ongoing improvements in the benefit package. This study highlights the need for a transparent, data-driven approach to benefit package revision to ensure cost-effectiveness, improve access to essential healthcare services, and enhance financial sustainability. The proposed reforms aim to strengthen Nepal's health insurance framework and contribute to achieving universal health coverage (UHC).

Health Facilities Financial Resilience amidst COVID-19: Insights from out-of-Pocket Payments Revenue Declines in Gabon

PRESENTER: **Olouyomi Scherif Adegnika**, CERMEL

Background: The recent COVID-19 pandemic strain on health systems all over the world was unprecedented, and low- and middle-income countries like Gabon faced unique challenges. With the aim of controlling the pandemic and safeguarding public health, the Gabonese government implemented a range of interventions which also resulted in significant socio-economic challenges. In Gabon, small health facilities from the public sector partially depend on patients' out-of-pocket payment for funding source. During the pandemic, restrictive measures, including recommendations to avoid health facility visits unless necessary, likely disrupted healthcare utilization and revenue streams. However, evidence on the extent and implications of these disruptions is scarce, particularly in smaller, resource-constrained facilities.

Objective: This study examines the impact of COVID-19 restrictions on healthcare utilization and associated revenue from out-of-pocket payments at the Isaac Dispensary in Lambaréné, Gabon. It aims to provide evidence for strengthening healthcare financing and building

resilience against future shocks.

Data and methods: A retrospective analysis using registry data from the Isaac Dispensary spanning 2019–2022 was conducted. A linear regression model was employed, with weekly visit numbers as the dependent variable, and weekly time period, average temperature, and average patient age as independent variables. The analysis compared healthcare utilization and relative revenue trends before, during, and after COVID-19 restrictions. Key events, including the 1st of April 2020 onset of the pandemic in Lambarene, and subsequent policy changes, were incorporated to assess temporal effects.

Results: The analysis revealed a significant drop in weekly visits and out-of-pocket revenue during the lockdown period compared to the pre-pandemic baseline. At the pandemic's onset, the dispensary experienced an average weekly decline of 23 visits, corresponding to a revenue reduction of 291,103 XAF, approximatively USD 579.00 . Notably, the drop was recovered by the subsequent increase in visits over the 25 weeks of observation as restrictions eased, suggesting partial resilience. Sensitivity analyses highlighted anticipatory effects, with declines in visits and revenue (33 visits weekly) starting mid-March 2020, coinciding with Gabon's first confirmed COVID-19 case in the capital city Libreville.

Conclusions: This study underscores the vulnerability of small health facilities in Gabon that rely heavily on out-of-pocket payments from patients for their revenue. The findings suggest significant financial strain on the Isaac Dispensary during the pandemic, highlighting the urgent need for diversified and sustainable healthcare financing mechanisms. Policies should prioritize strengthening the resilience of small health facilities to ensure continuous service delivery during future crises, mitigate disruptions, and maintain access to quality healthcare for vulnerable populations in Gabon and similar contexts.

Assessing the Value of Digital Health Technology Investments on the Management and Outcomes of Non-Communicable Diseases (NCDs) in Sub-Saharan Africa: Evidence from Service Delivery Indicators (SDIs)

PRESENTER: **Sharon Stella Musonza**

Background: In the face of emerging complex health challenges, digital health technologies have proven to be a game-changer on how we respond and approach public health. According to Arafa et al (2023), health technologies are rapidly evolving and transforming healthcare delivery. Efficient implementation of these technologies has potential to significantly improve accessibility and flexibility, even in Low- and Middle-Income Countries (LMICs) (Senbekov et all, 2020). However, little is known on the exact value of health technologies adoption in LMICs. In the face of dwindling external funding, 'choking debt' and limited fiscal space in LMICs who have already struggling health systems, now is the time to start thinking about optimal spending. Africa missed out on many gains because of lagging in adoption of technology, particularly in healthcare.

Aim: To carry out a 'Health Technology Assessment' that identifies the digital health technologies that gives the best value to support LIMCs-based policy making in priority setting in the management of NCDs.

Data sources: World Bank Service Delivery Indicators (SDIs) – already have access: World Health Organisation (WHO), observatory Demographic and Health Surveys (DHS), World Development Indicators (WDI)

Methods: 1. Assessing the Level of Digital Health Technology Adoption a. Literature review b. And trends in SDIs - commentaries 2. Analyse the impact of digital health technologies investment on NCDs outcomes (using Fixed Effects or Randoms methods) a. Quantify the effect of digital health technologies on NCDs outcomes eg reduced readmissions, improved treatment adherence and mortality rates b. Assess the differential impacts across socio economic groups, facilities settings/location and across countries 3. Evaluate the Cost effectiveness of digital health technology investments {using the Extended Cost-effective Analysis model and or/ propensity score matching (PSM)} a. Conduct an economic evaluation to estimate QALYs gained and DALYs averted resulting through digital health interventions for NCDs eg using ECEA, health technology assessment, health economic modelling to estimate the benefit cost ratios and net monetary benefits

Results: • Documenting the level of adoption of digital health technologies and assessing it versus global levels and international recommendations – read trends on factors influencing adopting certain technologies in a negative way or positive way • Paint the picture of the exact impact of digital health technologies on NCDs outcomes and general health system outcomes in terms of money invested over deaths rates, patient management and treatment compliance turnover • Quantify the real value of technology investment to readable format eg DALYs averted and QALYs gained and see what technologies matter the most in NCDs response.

Conclusion: This study adds insights into the role of health investments in technology in improving the management and outcomes of NCDs in LMICs. It measures the exact value and aids in prioritising needs in LMICs that have competing needs with limited fiscal space for health. It offers practical insights for policymakers to optimize health expenditure at a time they are forced to scale up digital health technologies in healthcare by complex health issues the most significant one being the COVID 19 pandemic.

Ripples in the Pond: The Impact of Parental Health Shocks on Children's Wellbeing

PRESENTER: **Maiken Skovrider Skovrider Aaskoven**, University of Southern Denmark

BACKGROUND: The onset of a major illness can have devastating effects, impacting not only the individual but also causing ripples through the entire household, particularly affecting children. If a parental health shock reduces investments in children, it may have profound implications for children's health and wellbeing, leading to poor outcomes later in life. Several theories propose returns on investments in children, but only few studies have so far assessed the intergenerational transmission of a health shock on the next generation's wellbeing.

OBJECTIVES: This study contributes to the literature by providing robust causal evidence of the effects of a parental health shock on children's wellbeing. Wellbeing is measured on a spectrum of severity, ranging from subjective wellbeing (SWB) to the use of medication and inpatient admissions for mental disorders. The study also identifies family-related characteristics that modify or accentuate the impact of

parental health shocks, and systematically investigates different trajectories of the health shock.

DATA AND METHODS: Children aged 6-16 living in Denmark (2015-2021) are linked to information on their (grand-) parents using nationwide Danish registers containing comprehensive information on health and social characteristics. To overcome the endogeneity of health, the first diagnosis of an acute and severe health shock, cancer, is used. To measure varying degrees of severity, wellbeing is measured on a spectrum. Child SWB is measured using data from the yearly national pupil wellbeing survey. Also school absence. Mild mental distress is measured as use of psychologists or talking therapy in the primary sector, moderate mental distress is measured as the use of anxiety or antidepression medication, while severe mental distress is measured as out- and inpatient health care services in the secondary sector for mental disorders. We employ a staggered difference-in-difference design to account for the endogeneity of a parental health shock, and adjust for various factors, e.g., the child's age and parents' socioeconomic position. We distinguish between fatal and non-fatal health shocks. We perform several robustness checks, e.g., considering non-lifestyle cancers.

RESULTS: Initial findings suggest that parental health shocks negatively impact the wellbeing of the next generation. Children affected by these shocks exhibit higher rates of school absences and mild mental distress, often requiring support such as talk therapy or psychological counselling. These effects are considerably more pronounced when the parental health shock is fatal. Interestingly, however, school wellbeing, use of psychotropic medications, and severe mental distress do not appear to be significantly impacted by parental health shocks.

CONCLUSIONS: The preliminary findings underscore the intergenerational impact of parental health shocks on children's wellbeing. While the effects generally manifest as increased school absences and mild mental distress rather than severe issues, these impacts are nonetheless significant, especially when the health shock is fatal. These results have important policy implications, emphasizing the need to improve children's access to psychotherapies and mental health care following traumatic household events. Recognising and addressing these broader familial impacts is essential in mitigating the long-term effects of health shocks on children's lives.

Exploring the Dynamic Effects of Income Inequality on Health Outcomes: A Longitudinal Empirical Analysis in the Australian Context

PRESENTER: **Han Cheng**

Background: Income inequality has emerged as a pressing socioeconomic issue with profound implications for population mental health. Australia presents a compelling case study, having experienced rising income inequality (Gini coefficient from 0.27 to 0.32, 1982-2018) alongside growing mental health concerns, with one in five adults experiencing mental disorders annually. The last major Australian investigation was conducted over a decade ago, creating a significant literature gap.

Objective: This research aims to examine the causal impact of income inequality on mental health outcomes in Australia using advanced methodological approaches. We seek to establish the causal effects of income inequality on mental health, analyze how different dimensions of inequality differentially affect mental health outcomes, and determine whether these effects vary across gender groups. The proposed dual methodological framework allows for the use of both traditional econometric methods and state-of-the-art machine learning techniques while ensuring that estimators remain unbiased and normally distributed asymptotically.

Methodology: We utilize longitudinal data from 22 waves (2001-2023) of the Household, Income and Labour Dynamics in Australia (HILDA) survey, comprising 433,102 observations from 24,857 unique individuals. Our dual framework combines individual fixed effects regression with double machine learning (Double ML) techniques using Random Forest and LASSO methods. Mental health is measured using the SF-36 mental health scale, with inequality calculated at local community level.

Results: Traditional fixed effects models show limited evidence for aggregate inequality effects, with only relative deprivation demonstrating significant negative associations (-12,889.49, $p<0.01$). In contrast, Double ML methods uncover significant effects previously undetected. The Theil index shows strong negative effects across both methods (-4.49 and -4.04, $p<0.01$), while Atkinson indices reveal that inequalities affecting lower-income groups have the strongest negative mental health implications. Gender-stratified analyses demonstrate that women show stronger responses to multiple inequality dimensions.

Conclusion: This study provides evidence that the inequality-mental health relationship is substantially more complex than previously understood, with traditional methods potentially underestimating these relationships. Our findings suggest that effective policy interventions require precision in measurement and targeting, with different inequality dimensions calling for different policy responses.

Causal Inference with Time-to-Event Outcomes: A Debiased Machine Learning Framework for Treatment Parameters

PRESENTER: **Meimei Chen**

Background: Causal inference is crucial in health econometrics for assessing the effectiveness and impact of health interventions. Traditionally, Randomised Controlled Trials are used to identify causal impact. However, advancements in data collection technologies, such as wearable devices and electronic health records, have significantly increased access to complex observational data, presenting new opportunities and challenges for health outcome evaluation. Concurrently, machine learning (ML) has gained recognition for its ability to handle and analyse large, complex datasets. This has led to the development of methods integrating ML with causal inference, including the notable approach of double machine learning (DML).

Objective: This research aims to adapt the DML framework for use with survival data, which are critical in health economics research for understanding survival and duration until events. The proposed method in this research allows for the use of a broad array of state-of-the-art ML methods while ensuring that the estimator remains unbiased and normally distributed asymptotically, which allows for the derivation of valid confidence intervals.

Methodology: This research develops a new framework for causal analysis with right-censored time-to-event data based on DML. In addition to the three fundamental assumptions of Rubin's potential outcome framework (i.e., exchangeability, consistency, and positivity), we assume that censoring is independent of the treatment assignment mechanisms, given all covariates. To remove bias introduced by ML methods, we provide a Neyman orthogonal score function for the parameters of interest, nuisance parameters, and censoring indicator. The Neyman orthogonality ensures that the estimator, which identifies our parameters of interest, is locally insensitive to the values of nuisance parameters. We also prove that estimators given in our research achieve a root-N rate of convergence and are approximately normally distributed.

Results: We used both simulated and real-world datasets to evaluate the accuracy and stability of our method. First, we showed that various state-of-the-art ML models, including random forests, gradient boosting machines, and neural networks, can be integrated into our method to estimate the nuisance parameters without compromising the consistency of our parameters of interest. Second, we compared the performance of our method with several conventional statistical methods on simulated datasets. We showed that as the number of nuisance parameters increases, our method remains stable. Third, we applied our method to a real-world dataset from the Linked Births and Infant Deaths Database (LBIDD). We compared our method to alternatives based on absolute bias, mean squared error, and standard deviation. Our method exhibited relatively smaller bias and lower variance.

Conclusion: Our research successfully extended the causal inference framework DML to incorporate time-to-event outcomes, showing robust performance on both simulated and real-world datasets. This method offers a powerful tool for health economists, enabling more accurate causal inference in studies involving survival data.

12:30 PM –2:30 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Lotus

Data Driven Decision Making for Universal Health Coverage: Leveraging Health Insurance Claims Data

1:30 PM –5:00 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Karangasem

Tackling NCDs and Obesity: The Role of Food Systems and Diets in Asia

1:30 PM –5:00 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Jasmine

EQ-5D in the Indo-Pacific Region

1:30 PM –5:00 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Singaraja

An Introduction to Coincidence Analysis/ Configurational Comparative Analysis to Explore Causal Pathways

1:30 PM –5:00 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Surabaya

The Role of Social Health Insurance in Financing Healthcare in LMICs

3:00 PM –5:00 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Bougainville

Investing in the Foundations of Human Capital: Unpacking Indonesia's Success in Improving Child Nutrition

3:00 PM –5:00 PM SATURDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Lotus

Tobacco Taxation Frameworks to Optimize National Health Financing

Sunday

8:30 AM –12:00 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Dahlia

Building Capacity for Conducting Systematic Reviews of Economic Evaluation

8:30 AM –12:00 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Jasmine

Complex and Fragmented Financing Inhibits Innovation to Improve PHC Performance in LMICs: Evidence and Strategies for Reform

8:30 AM –4:30 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Orchid

Lessons from Indonesia’s Strides Towards Universal Health Coverage over the Last Decade

8:30 AM –4:30 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Frangipani

Priorities in Immunization Economics: Reaching Zero-Dose Children and Missed Communities; Sustainability, Prioritization and Optimization. Day 2

8:30 AM –12:00 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Singaraja

The Role of Digital Public Infrastructure in Strengthening Public Financial Management: Applications to Service Delivery Across Africa and Asia

8:30 AM –12:00 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Bougainville

Beyond Cost-Utility Analysis: Should we Consider Other Value Elements?

8:30 AM –12:00 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Karangasem

Strategic Purchasing for Universal Health Coverage: Policy Enablers vs Deterrents

8:30 AM –12:00 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Hibiscus

Navigating Cost Sharing in Healthcare: Building Sustainable Financial Models

10:00 AM –12:00 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Lotus

Evaluation and Implementation of Artificial Intelligence Within Learning Health Systems

10:00 AM –12:00 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Bandung

The Value of Vaccines Beyond Healthcare Savings – A Case Study on the Macroeconomic Impact of Dengue and why Vaccine HTA Should Reflect the Broad Value of Vaccines

10:00 AM –12:00 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Magnolia

Strengthening Capacity in Health Economics Through Global Health Research Programmes: Lessons and Opportunities

1:00 PM –4:30 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Surabaya

Women in Economics: Barriers and Strategies from Entry to Leadership

1:00 PM –4:30 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Jasmine

Health System Comparisons: Collaborative Efforts to Harness National Data for Global Insights

1:00 PM –4:30 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Singaraja

How can Countries Overcome Bottlenecks to Primary Health Care (PHC) Provider Fund Flows and Provider Autonomy in LMICs? – Experiences from Members of the Joint Learning Network for Universal Health Coverage (JLN)

1:00 PM –4:30 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Bandung

Building Capacity for Economic Research on Tobacco Regulation in Low- and Middle-Income Countries

1:00 PM –4:30 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Hibiscus

Long-Term Care: Addressing Challenges and Shaping the Future of Care Systems

1:00 PM –4:30 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Karangasem

Health Policy by Design: Introducing HTA Tools and Thinking

1:00 PM –4:30 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Magnolia

Capacity Building and Experience Sharing on Designing Strategic Purchasing Programs in Low- and Middle-Income Countries: Towards Universal Health Coverage

1:00 PM –4:30 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Bougainville

Improving the Financing of Medical Supply Chains in Low- and Middle-Income Countries

2:30 PM –4:30 PM SUNDAY [Pre-Congress And Sponsored Sessions]

Bali International Convention Centre – Lotus

Bridging Theory and Practice: Launch of Health Financing in Low and Middle Income Countries: the Path to Universal Health Coverage – A New Resource for the Health Economics Community

6:00 PM –7:40 PM SUNDAY [Special Sessions]

Bali International Convention Centre – Mangupura Hall

Opening Plenary: Using Economic Policy Instruments to Improve Health: Challenges and Opportunities

MODERATOR: **John Cawley**, Cornell University

SPEAKER: **Kara Hanson**, London School of Hygiene & Tropical Medicine (LSHTM); **His Excellency Budi Gunadi Sadikin**, Minstry of Health, Indonesia; **Hasbullah Thabrany**, ThinkWell, LLC/USAID Health Financing Activity; **Anne Marie Thow**, University of Sydney

7:40 PM –9:00 PM SUNDAY [Social Events]

Bali International Convention Centre – BICC Foyers

Opening Reception

Monday

8:30 AM –10:00 AM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Hibiscus

Equity Considerations in Economic Evaluations

MODERATOR: **Saudamini Dabak**, Health Intervention and Technology Assessment Program (HITAP)

Ind-1107 Distributional Cost-Effectiveness Analysis: A Case Study of Dialysis in Thailand

PRESENTER: **Chittawan Poonsiri**

Introduction and Objectives End-stage renal disease (ESRD) presents a substantial economic burden on affected patients, their families, and healthcare systems, particularly when considering its inclusion in the benefit packages. Cost-effectiveness analysis (CEA) is commonly used to assess whether a treatment provides good value for money, as it evaluates the economic viability of treatments such as peritoneal dialysis (PD) and hemodialysis (HD). Previous CEA studies in Thailand indicated that neither PD nor HD were considered cost-effective. However, PD was deemed a relatively more economically efficient option than HD as an initial treatment, leading the Thai government to include PD in the benefit package. Traditional CEA, however, has some limitations. It focuses exclusively on cost and health outcomes, without accounting for health inequity, one of the critical issues in many countries. Distributional Cost-Effectiveness Analysis (DCEA) addresses this gap by integrating equity considerations, enabling evaluations that consider not only total health benefits but also their distribution across different population groups. The objective of this study is to apply DCEA to the case of renal dialysis in Thailand, examining the health and equity impacts of including PD and HD in the national health insurance scheme. **Methods** To conduct DCEA model, we divided our study into two phases. Phase 1 focused on estimating the baseline health distribution across Thai population and calculating an equity index, an essential step for incorporating equity metrics into the model. During this phase, two stakeholder meetings were conducted. In the first meeting, we introduced DCEA concepts to a diverse group of stakeholders, including policymakers, healthcare professionals, researchers, and patient representatives, providing them with foundational knowledge of the approach. The second meeting presented preliminary results from the baseline health distribution and health inequality aversion survey, allowing stakeholders to engage with and provide feedback on these findings. In Phase 2, we applied data and insights from Phase 1 to build the DCEA model. The first step was drafting “staircase of inequality,” which mapped disparities in health outcomes among ESRD patients, highlighting specific inequities within this patient population. Parameters from Phase 1, including baseline health distribution data and the derived equity index, were then integrated into a modified CEA framework for ESRD treatments. This model facilitated a comparative assessment of PD and HD based on both total health outcomes and reductions in health inequity. Using a social welfare index, we evaluated the trade-offs between maximizing total health benefits and minimizing health disparities, providing a comprehensive view of the interventions’ social and economic impacts. **Potential Impact** The findings of this study will provide crucial insights for policymakers in Thailand on how equity-focused economic evaluations could shape healthcare policy. By presenting a comprehensive analysis of both the health and equity impacts of dialysis treatments, this study serves as a potential model for integrating equity considerations into economic modeling. Additionally, the result from health inequality aversion survey can be used as a reference for future DCEA studies in Thailand

Ind-1729 Differential Health-Economic Outcomes of Anti-Amyloid Treatment for Alzheimer's Disease between Ethnoracial Groups in the United States

PRESENTER: **Adam Atherly**, Virginia Commonwealth University

AUTHORS: Eline M. van den Broek-Altenburg, Eric Ross

OBJECTIVES: There is concern that standard cost-effectiveness analyses can obscure important differences in outcomes across demographic groups. In this paper, we evaluate the effect of novel anti-amyloid treatments for Alzheimer’s disease (AD) on health-economic outcomes among ethnoracial groups in the United States.

METHODS: We used a previously validated mathematical model of Alzheimer’s disease treatment to project health and economic outcomes under usual care vs. with donanemab (an exemplar anti-amyloid antibody) for three ethnoracial groups: Hispanic, non-Hispanic Black, and non-Hispanic White. Key model inputs included the efficacy of donanemab (32% reduction in disease progression); price of donanemab ($26,500/year); relative medical care costs for Hispanic, Black, and White individuals (1.10, 1.22, 1.00); and likelihood of timely diagnosis for individuals with AD in the three ethnoracial groups (44%, 37%, and 61%). Outcomes include healthcare sector costs (in 2020 USD), quality-adjusted life-years (QALYs), and incremental cost-effectiveness ratios (ICERs) at a lifetime horizon.

RESULTS: We project that a universal rollout of donanemab to eligible patients would result in a gain of 1.71 QALYs/100,000 patients with AD and increase healthcare sector cost by $389,000, yielding an ICER of $228,000/QALY. Relative to their share of the population with AD,

Hispanic individuals accrue 5% more QALY gains than expected, Black individuals 35% less, and White individuals 6% more. Sensitivity analysis with all groups assigned an equalized 61% likelihood of timely diagnosis alters the direction of these inequalities: Hispanic individuals accrue 24% more QALY gains than expected, Black individuals 5% more, and White individuals 5% less.

CONCLUSION: Based on current ethnoracial disparities in AD care, the benefits and costs of anti-amyloid treatment are likely to be unevenly distributed between ethnoracial groups, with Black individuals receiving a markedly lower share of the benefits. Efforts to improve timely diagnosis rates for Black patients would facilitate a more equitable distribution of benefits.

Ind-1990 Estimating the Distributional Impact of Improving Access to Snake Antivenom in Urban and Rural Lao PDR: An Extended Cost-Effectiveness Analysis

PRESENTER: **Chanthawat Patikorn**
AUTHORS: Jeong-Yeon Cho, Khamlub Senbounsou, Suthira Taychakhoonavudh, Thanapol Khuharatanachai, Nathorn Chaiyakunapruk, Mayfong Mayxay

Background: Lao PDR is affected by snakebite envenoming. Snakebite victims, especially in rural areas, primarily seek traditional healers to avoid the inadequate supply of antivenoms at hospitals and the financial burden of high out-of-pocket (OOP) expenditures, potentially posing health inequities between rural and urban Lao PDR.

Methods: An extended cost-effectiveness analysis (ECEA) was performed to evaluate the distributional impact of improving access to antivenom in urban and rural Lao PDR by comparing the “current access” with “full access” in which all victims received antivenom at conventional hospitals. Outcome estimates included disease burden (Disability-adjusted life years [DALYs], Case fatality rate [CFR], and mortality) and economic burden (% household OOP expenditures per monthly household income).

Results: In current access, rural areas compared to urban areas had higher deaths (+2.79 mortality rate per 100,000 population), and DALYs lost (+70.11 DALYs lost per 100,000 population), but lower household economic burden (-25% OOP expenditure per monthly household income). In the full access, rural areas compared to urban areas had higher deaths (+1.27 mortality rate per 100,000 population), DALYs lost (+32.14 DALYs lost per 100,000 population), and household economic burden (+39% OOP expenditure per monthly household income).

Conclusions and implications for policy and practice: Inequities existed in Lao PDR as rural areas had a higher disease burden than urban areas. Improving access to antivenom improved the gaps in disease burden but worsened the gaps in household economic burden. Strategies focusing on ensuring equitable access and providing financial assistance are needed.

Ind-2558 Cost Consequence Analysis in the Real World: Making Difficult Decisions in Remote Australia

PRESENTER: **Jackie Roseleur**
AUTHORS: Narelle Campbell, Chris Hince, Chris Rissel, Kylie Stothers, Jonathan Karnon

Background Aboriginal and Torres Strait Islanders account for 3.8% of Australia's population, increasing from 1.9% in major cities to 32% in remote and very remote areas. These populations often travel long distances to access services in urban centres. Disability and rehabilitation services in remote Australia are limited by geographic isolation and scarce allied health professionals. A student-assisted service model, co-designed with community leaders, was piloted and expanded in a very remote location (Nhulunbuy, Northern Territory – population 3,267, distance to nearest major hospital 1,025km). Over 12 months, three rounds of four students each delivered eight-week services, supervised by an interprofessional team and local Aboriginal (Yolŋu) cultural consultants, with grant and university support. ## Aim The first aim of this study is to describe the costs and activities of a student-assisted service model and to model the costs of providing the same level of services via alternative service models (resident clinician and fly-in-fly-out). The second aim is to consider the broader effects of the student-assisted service, including improved cultural safety in service delivery and increased likelihood of students practicing in remote communities when qualified. Headroom analysis will be used to estimate the service’s maximum cost to be considered cost-effective. ## Methods Costs for the delivery of the same level of care provided by the student-assisted model were estimated for each service delivery model from a health system perspective. Quantitative and qualitative data were analysed to inform the broader effects of the student-assisted models in remote Australia. The headroom analysis considers stakeholder expectations regarding the program's benefits and overall value for money, while also identifying the types of evidence and effect sizes of the consequences of the student-assisted model that would be required to demonstrate value for money, including a more culturally responsive health service, community appreciation of the services, improvements in the quality of life associated with increased access to allied health services and increases in the future allied health workforce with a desire to work in remote communities. ## Key results Fifty clients participated in the student-assisted service model. Approximately half were female and 96% were Aboriginal and/or Torres Strait Islander. The total cost of the student-assisted service model was $118,141, with a cost per client of $2,363. For the resident clinician and the fly-in-fly-out models of care, the total cost of the service was $45,743 and $75,123, respectively, with a corresponding cost per client of $915 and $1,502, respectively. Key stakeholders from NT Health will be identified for input on headroom analysis. An information session will determine whether the available evidence to inform expected effects on clients, cultural safety and workforce justify the additional costs. ## Conclusions and implications This cost-consequence analysis underscores the need to balance financial costs against non-monetary benefits, including culturally responsive care and long-term workforce development in remote communities. Incorporating these multifaceted factors into decision-making frameworks is crucial for evaluating value in remote and Indigenous health contexts, enabling policymakers to assess whether broader positive impacts on health equity and access for Aboriginal and Torres Strait Islanders justify the additional costs.

Ind-1900 Cost-Effectiveness and Budget Impact Analysis of an Evidence Based Co-Designed Model of Cardiac Rehabilitation for Patients in Rural and Remote Areas

PRESENTER: **Norma Bulamu**, Flinders University
AUTHORS: Billingsley Kaambwa, Alline Beleigoli, Lemlem Gebremichael, Robyn Clark

Aim To assess the cost-effectiveness and budget impact of implementing a model of cardiac rehabilitation (CR) for patients in rural/remote areas which included a choice of face to face, telephone, web based, or primary care-based modes of delivery, the Country Health Attack Program (CHAP), compared to usual care (non-CHAP). ## **Methods** This was a prospective cohort study including all patients referred to CR in South Australia. Patients in CHAP were matched to non-CHAP by age, sex and Australian Refined Diagnosis-Related Groups (AR-DRG) in a 1:1 ratio. We evaluated 12-month attendance and completion of CR as the primary measure of effectiveness. Effectiveness data was obtained from a linked dataset of hospital admissions, CR referral and attendance. Costs were calculated based on the AR-DRG and length of stay. The analysis was conducted from a health system perspective with incremental cost-effectiveness ratios per CR attendance and completion calculated. A budget impact analysis estimated the financial benefit of implementing CHAP over five years for all individuals who attend CR in South Australia (30% of individuals eligible for CR). ## **Results** There were 1913 patients each in CHAP and non-CHAP. CR attendance through CHAP was more costly but more effective (costs: $6,205 vs $5,855; attendance: 24.1% vs 23.8%) and in terms of completions CHAP was superior: it was cheaper and more effective (costs: $6,542 vs $8,689; completions: 77.1% vs 57.5%). Subsequently, for both models of care it cost less per CR completion (CHAP =$8,494/completion, non-CHAP= $15,129/completion) than per attendance (CHAP=$25,668/attendance, non-CHAP=$24,551/attendance). The CHAP model had over 50% chance of being cost-effective in improving CR completion and attendance. Uptake of the CHAP model would result in a cost reduction ranging from $2,110,501 at 20% uptake to $10,010,777 if all patients referred attended and completed CR. ## **Conclusions** The CHAP model of care, which involved a combination of face-to-face, telephone and web-based delivery for CR provides a less costly and more effective alternative for completion of CR. Adapting the CHAP model results in significant savings to the health care system, however, they can only be realised if all individuals attending CR complete the program.

Ind-953 Understanding Chronic Kidney Disease in Western Australia: Cost, Prevalence and Equity

PRESENTER: **Suzanne Robinson**
AUTHORS: Delia Hendrie, Richard Varhol, Kanika Mehta, Elizabeth Thomas, James Boyd, Kevin Chai, Aron Chakera, Crystal Lee, Sean Randall

Background: Chronic kidney disease is a major public health issue, with substantial costs and impacts on healthcare systems worldwide. In Australia, CKD often progresses silently, contributing to increased morbidity until patients reach end-stage kidney disease where the economic burden dramatically increases. CKD disproportionately effects more vulnerable populations, particularly those in lower socioeconomic groups and remote areas where healthcare access is limited.

Aim: This study aimed to elucidate the prevalence and cost of CKD in Western Australia, examining disparities over time associated with socioeconomic status and remoteness, to inform targeted public health interventions and healthcare resource allocation.

Methods: This study utilised the CKD.WA dataset, consisting of linked public and private pathology data from all major pathology providers in WA, along with hospital and emergency admissions and death registrations. Individuals were included within the dataset if they had a recorded creatinine pathology test from any provider. This large dataset provided detailed unit-record level information for over 2.5 million individuals from Western Australia.

Individuals were identified with CKD based on two eGFRs values >90 days apart, or 2 uACR values >90 days apart. Individuals were classified by remoteness and socioeconomic status based on their recorded postcode. Costs components included hospital, emergency, dialysis, outpatient, medication, general practice and pathology costs. Medication, general practice and pathology costs were derived from a separate general practice database consisting of clinical records for 600,000 individuals.

Results: The study analysed data from 2.501,188 individuals aged ≥18 years, from between 2010 to 2020. Overall CKD prevalence increased from 2010 (3.5%) to 2020 (5.6%). CKD prevalence grew at a faster rate in both regional and remote areas as compared to major cities, with prevalence rate 13% higher in remote areas, and 25% higher in regional areas as compared with major cities. CKD prevalence was highly associated with greater socioeconomic disadvantage, with those in the most deprived quintiles having nearly three times CKD prevalence as compared to those in the least deprived. Average yearly costs attributable to CKD were $3,367 for Stage 1, $4,114 for Stage 2, $3,607 for Stage 3a, $6,572 for Stage 3b, $11,456 for Stage 4 and $62,558 for Stage 5. Non-dialysis hospital costs were the biggest contributor, followed by dialysis costs. The estimated total cost of CKD to Australia was $8.3 billion for 2019.

Conclusion: The study highlights significant growth and inequities in CKD across Western Australia. While CKD costs per individual are highest in later stages, the greater number of early-stage CKD cases means the majority of the cost burden is located among early-stage cases. Findings underscore the need for targeting health policies and interventions addressing the unique challenges faced by disadvantaged populations and those living in regional and remote areas.

Ind-367 Costs Associated with the Management of Wilms Tumor in Tanzania, A Narrow Societal Perspective.

PRESENTER: **Amosi Kilipamwambu**
AUTHORS: Rashid Mruma, Frida Ngalesoni, Lulu Chirande, Christopher Chambo
ABSTRACT

Background: Non-communicable diseases (NCDs) are a major global health concern, particularly impacting Low- and Middle-Income Countries (LMICs). Childhood cancer, notably Wilms tumour (WT), presents significant challenges in LMICs like Tanzania due to disparities

in healthcare access and resources. However, in Tanzania, managing WT is hindered by a lack of understanding of its financial implications. This study aims to address this gap by analysing the costs of WT management in major specialized hospitals in Tanzania to facilitate better resource allocation and cost-effective strategies.

Objective: To determine Costs associated with the management of Wilms Tumor at Muhimbili National Hospital (MNH) and Ocean Road Cancer Institute (ORCI) in Tanzania.

Methods: We utilized a cross-sectional costing study for Wilms tumor (WT) management, employing micro-costing with top-down and bottom-up approaches. A 'narrow' societal perspective approach, for the financial year 2021/22 was used to identify, quantify, and value resources used for WT Care after verification at the costing unit, with exit interviews with 52 caregivers, Data analysis was done through Excel and SPSS version 20 for both provider and patient perspective.

Results. From the patient perspective, 51 caregivers were female, averaging 32±5 years old, with 34.6% self-employed, 40.4% having primary education, and 78.8% uninsured. The annual unit cost for managing Wilms' tumor (WT) was 1,934,627 Tsh (737 USD) for early-stage and 3,230,604 Tsh (1,230 USD) for advanced-stage WT. From the provider's perspective, annual costs were 2,901,660 Tsh (1,105 USD) for early-stage and 8,744,835 Tsh (3,329 USD) for advanced-stage WT treatment.

Conclusion and Recommendations. Treating advanced-stage Wilms' tumor (WT) costs 2-3 times more annually than early-stage WT, highlighting the need for early diagnosis and treatment. Targeted interventions to enable early detection and care for children with WT will enhance cost-effectiveness.

Ind-611 Economic Evaluations of Stigma and Interventions Which Aim to Reduce Stigma: A Systematic Review.

PRESENTER: **Caroline Watts**, UNSW Sydney
AUTHORS: Elena Cama, Carla Treloar*, Virginia Wiseman*

Background There is growing recognition about the impacts of stigma on health, particularly the role of stigma in producing and reinforcing disparities in access to health care. Economic evaluations alongside interventions to reduce stigma are required to provide evidence of costs and effectiveness and support decision making and policy change. To date there has been no synthesis or appraisal of the methods used in economic evaluations which value stigma. **Aims** A systematic review was conducted with the aim to provide insights into types of interventions and populations targeted, methodologies applied and properties of the outcome measures used to value stigma. **Methods** Adhering to PRISMA guidelines, six electronic databases Embase PubMed, CINAHL, Scopus, PsychINfo, and Cost-Effectiveness Analysis (CEA) Registry were searched using the search terms; stigma, discrimination, cost effect* or cost benefit* or cost utility* or societal cost. The search was conducted from December 2023 with no limitations. Studies were included if they were a health economic evaluation of an intervention which aimed to reduce stigma or studies which defined and measured the cost of stigma as a study outcome. Two reviewers (CW, EC) completed the data extraction, and checks for reporting standards (Consolidated Health Economic Evaluation Reporting Standards (CHEERS)) and quality (Consensus on Health Economic Criteria (CHEC)) checklists. The review was registered on Prospero CRD42024597127 **Results** In total, 1378 articles were screened, 166 full text articles were reviewed, and 26 studies met the inclusion criteria of which the majority (24 studies) were from high income or upper-middle income countries and two studies were from lower-middle or low-income countries. The stigmatised conditions/populations included men who have sex with men, HIV, mental health, epilepsy, racism, ageism, and offending. The interventions were directed at people living with a stigmatised condition, health care workers, family, community members, work colleagues and the police. Evaluation types included thirteen full economic evaluations (nine cost-effectiveness analyses, three cost-benefit analyses, one cost consequence) and nine partial evaluations. Stigma measures used in ten studies were derived from questionnaires or interviews and thirteen studies used measures from validated instruments of which six studies used quality of life measures (QALYs, DALYS, Wellbeing) and three studies used generic measures of stigma related health or wellbeing outcomes. Stigma reduction strategies targeted the individual (18 studies), interpersonal (18 studies), community (11 studies), and structural (4 studies) of stigma. Reporting standards and quality for most studies were assessed as fair or adequate. **Conclusion** Cost of illness studies indicate there is a substantial cost burden due to stigma. Community level interventions showed mixed results with some studies having a range of outcome measures. There is a lack of consistency and clarity in both the conceptualisation and measurement of stigma in health economic evaluations. Generally, studies did not address wider issues such as the affordability, scalability, or sustainability of interventions. Inclusion of a measurement of stigma is important for evidence-based health practice to reduce prejudice and discrimination and support decision making.

abs-os27 Cost-Effectiveness of Epitope Compatibility in Kidney Allocation: A Canadian Discrete Event Simulation Study

PRESENTER: **Shahzad Ghanbarian**
AUTHORS: Steven Shechter, Matthew Kadatz, Anat Fisher, Louisa Edwards, Karen Sherwood, James Lan, Paul Keown, Prof. Stirling Bryan

Background: Kidney transplantation is the treatment of choice for patients with end-stage renal disease (ESRD), but these life-saving transplants may fail due to rejection. This has prompted development of advanced genomic technologies to reduce rejection risk. The use of epitope compatibility to guide deceased donor allocation is one promising approach. Greater epitope compatibility is likely associated with reduced graft loss, but some people will wait longer for a good match. We have developed a Discrete Event Simulation (DES) model to evaluate cost-effectiveness and equity implications of adding epitope compatibility to the current kidney allocation criteria in Canada.

Methods: A DES model was built using kidney transplant longitudinal data from British Columbia (BC). The model captures individual patient and donor characteristics, comorbidities, and clinical outcomes, simulating both pre- and post-transplant pathways, including waitlist dynamics, rejection, graft survival, and mortality. Patients and donors were sampled using bootstrapping to preserve correlations in the data. For our cost-effectiveness analysis, the base-case scenario applies existing BC organ allocation criteria, prioritizing patients primarily by wait time, with

additional prioritization for pediatric and immunologically sensitized patients. The intervention scenario sees the use of epitope-based matching in conjunction with these other priority criteria. Costs (CAD$ 2024) are estimated from a public payer perspective, and time-to-event outcomes are modeled using Cox proportional hazards. Incremental costs, life-years, and quality-adjusted life-years (QALYs) will be estimated, and sensitivity analyses performed to address key uncertainties.

Results: The model simulates a dynamic cohort of ESRD. Our observational cohort comprises all patients who joined the BC deceased donor waitlist for a kidney transplant between 2008 and 2018. A total of 2,148 patients (median age 55) joined the waitlist, with 1,245 (median age 55) receiving a transplant from a deceased donor. Based on cumulative incidence functions (CIFs) accounting for competing risks, 50% of patients received a deceased donor kidney within two years (median wait time: 671 days). During the same period, 3% died on the waiting list, 10% received a living donor transplant, and 3% were removed due to medical or other reasons. Our micro-costing analysis estimates the kidney rejection costs range from $2,121 to $24,714, depending on the type. Previous research suggests that better epitope matching of donor organ and recipient reduces transplant rejection, with potential for associated cost savings and improved post-transplant outcomes. However, epitope-based allocation comes with equity challenges: waiting times will increase for difficult-to-match patients. Our Canadian kidney transplant DES model is fully developed and currently in the model validation phase, to refine estimates and ensure robustness. Once validated, the model will predict the economic impact and health outcomes of epitope-based allocation and represent a powerful tool to undertake equity-focused analyses.

Conclusion: This DES model represents a novel tool for evaluating the cost-effectiveness of epitope-based kidney allocation and exploration of equity-efficiency trade-offs. Evidence-based support will be given to optimal design of organ allocation criteria reflecting both efficiency and equity considerations. While tailored for epitope mismatch evaluation, the model can adapt to allow rapid evaluation of other innovations in kidney transplantation.

8:30 AM –10:00 AM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Bali

Cancer Policy: National and Global Perspectives

MODERATOR: **Laksono Trisnantoro**, "Health Policy and Management Department, Faculty of Medicine, Public Health and Nursing, University of Gadjah Mada"

Ind-2744 ChemoGlobe: A Forecasting Model to Support the Planning and Procurement Needs of The Global Platform for Access to Childhood Cancer Medicines (GPACCM)

PRESENTER: **Nancy S. Bolous**
AUTHORS: Jennifer L. Pauley, Hannah Sauer, Nickhill Bhakta, Meenakshi Devidas, Yichen Chen

Background: Cytotoxic chemotherapy is essential for nearly all childhood cancers. Although many drugs used in the pediatric space are generic, pharmaceutical agents continue to drive a significant portion of the overall treatment cost due to market challenges such as small volume orders and complex registration barriers. To ensure equitable access, St. Jude Children's Research Hospital, the World Health Organization (WHO), and the United Nations International Children's Emergency Fund (UNICEF) partnered in 2022 to create GPACCM, a $200 million initiative. Like the Global Fund, GPACCM will purchase and distribute childhood cancer medicines at no cost to recipient countries. Six pilot countries (Ecuador, Jordan, Uzbekistan, Zambia, Mongolia and Nepal) were selected and will receive the first drugs in Q1-2025. To support strategic planning and drug procurement, our team developed a robust global forecasting model, then compared the findings to real-world data from the six pilot countries to identify opportunities to improve the model.

Methods: For initial planning, our base-case estimates were determined for 200 countries and territories, using three components: cancer burden estimates, medication quantification, and prices. To calculate burden, published modeled data were used to estimate childhood cancer incidence, diagnosis, and survival. Medication requirements were determined by calculating cumulative doses for 50 chemotherapy and supportive care agents, from 210 standard regimens across 47 cancer subtypes (as per the International Classification of Childhood Cancers, 3rd edition), stratified by risk and stage. Cost data were sourced from the International Medical Products Price Guide and IQVIA. For model validation, real-world burden and treatment protocol data collected from the six pilot countries were used to update the model. Outputs were then compared to local forecasting estimates, institution-level consumption data, and discussed with local stakeholders.

Results: All global base-case forecasting estimates for planning are publicly available on a cloud-based dynamic visualization platform (chemoglobe.stjude.org). This platform enables users to explore context-specific data visualizations, with estimates dynamically adjustable across several parameters.** Based on our analyses, the estimated cost of treating all newly diagnosed childhood cancer patients in 2024—assuming timely diagnosis, normal weight, and treatment with curative intent—totals $876,860,260. During the validation phase, several major challenges were identified. First, assuming vial sharing can have major implications on quantities and costs. Additionally, a universal assumption of 10% wastage was not appropriate for every drug. Finally, although hospitals claimed to use certain standard regimens, they often locally adapted treatment resulting in major procurement differences.

Conclusion: ChemoGlobe is a novel forecasting tool that supported the planning and early procurement needs of the GPACCM. Based on context-specific datasets, real-world data and input from local stakeholders, we are implementing several modifications such as, incorporating country-, age-, and gender-specific weight datasets; tailoring wastage assumptions for individual medications; generating outputs in vial sizes alongside absolute values; incorporating real-world data from additional countries; using prices negotiated by UNICEF and integrating these enhancements into the ChemoGlobe visualization platform. These changes will provide more reliable, rapid estimates for global partners and

help meet the GPACCM goal of expanding access to 50 countries over the next four years.

Ind-2126 Adapting HPV Screening Models for Populations Vulnerable to Cervical Cancer: Using Multiple Data Sources for Prediction

PRESENTER: **Haode Wang**
AUTHORS: Luke Vale, Li Sun, Paolo Rossi, Anna Foss, Anneli Uusküla, Rosa Legood

Introduction: We explore the use of calibration to adapt an existing human papillomavirus (HPV) screening model to populations highly vulnerable to cervical cancer (CC). To do this, we use Estonia as a case study, where HPV screening is the primary test for CC. However, the routine screening uptake rate is disproportionately low among women with heightened vulnerability to infection, including sex workers, women living with HIV (WLWH), women using injecting drugs and other underserved populations. To estimate the effect of tailoring HPV screening models for such populations, we report our modelling strategy that combines data from (i) a population-based case-control trial, (ii) calibration targets of age-specific absolute risk of CC, and (iii) local real-world data from each specific population. Unlike most prior cost-effectiveness research, the model is able to provide high flexibility for estimating the cost-effectiveness across different populations using a consistent model structure to facilitate comparisons.

Methods: We developed a Markov model with seven health states, reflecting the Estonia CBIG-SCREEN intervention protocol. The intervention encouraged WLWH aged 25-65 to participate in self-sampled mailing screening or community-based CC screening centres, while the control group followed the existing screening protocol. Data for the natural history states were derived from a UK study (ARTISTIC trial in England) for unvaccinated people and used a multiplier to better align to the situation in Estonia. We obtained relative risks (RRs) of WLWH using a literature review. The proportion of women with risk factors, corresponding uptake rate and cost data were collected by the local team. Model calibration involved varying the UK to Estonia alignment multiplier with range 1-3.5, determined by the literature, targeting a better fit with Estonia HPV prevalence, CC incidence and high-grade squamous intraepithelial lesions (HSIL) prevalence. Using the best-fit multiplier value, the HPV screening sensitivity and specificity were also then calibrated due to possible screening operation variance. Calibration was conducted with both Nelder-Mead simplex method and BOBYQA Method. Goodness of fit was calculated by simple sum of square function, with a log transformation to minimize the unit difference.

Results: Both calibration methods supported using a multiplier of 2.38 and achieved an error statistic of <0.005. The multiplier increased to 2.38 and sensitivity/specificity decreased after calibration. Our preliminary findings suggest that, comparing tailoring screening to standard screening with an expectation that tailored screening gave a 20% uptake rate increase, the total direct cost per case screened would decrease from €2412 to €2164, and the total cancer incidence would decrease from 6% to 5%. This predicted cost saving resulted from early identification of high-risk HPV (types 18/16), so preventing progression to cancer.

Conclusion: This study presents a method of using calibration to leverage multiple data sources across settings to model and estimate the impact of a screening intervention specific to a new setting. The evidence synthesis strategy introduced in this study emphasize the feasibility and potential for using multiple sources of data for innovative intervention modelling. This approach could be useful for other researchers adapting models to their local situation.

Ind-1323 Evaluative Frameworks for Tumour-Agnostic Precision Oncology: Machine Super Learning for Determining Survival Impact and Cost-Effectiveness

PRESENTER: **Emanuel Krebs**, Cancer Control Research, BC Cancer
AUTHORS: Ms. Deirdre Weymann, Mr. Dean A Regier

Introduction: Multi-gene panel sequencing streamlines the identification of therapeutic targets for personalized patient care. Adoption remains limited due to uncertain clinical and economic impacts. Evidence from randomized clinical trials (RCTs) is the standard for regulatory and reimbursement deliberations, yet is unavailable for many precision oncology interventions. We determined the effectiveness and cost-effectiveness of tumour-agnostic multi-gene panel sequencing compared to single-gene testing for advanced cancers, including advanced non-small cell lung cancer, melanoma, and colorectal cancer. **Methods:** Our population-based retrospective study followed the target trial emulation framework using patient-level linked administrative health databases. We considered adult British Columbia, Canada residents with an advanced cancer diagnosis who received multi-gene panel sequencing or single-gene *EGFR*/*BRAF*/*KRAS* tests between 2016-2018, emulating random assignment via genetic algorithm-based 1:1 matching. Our primary analysis included the same number of multi-gene panel patients and controls by tumour type. Our secondary analyses consider tumour-agnostic matching and stratified matching by tumour to understand the implications of tumour-specific versus tumour-agnostic evaluative frameworks. After matching, we estimated mean three-year survival time and costs (public healthcare payer perspective; 2021 CAD) and calculated the incremental net monetary benefit (INMB) for life-years gained (LYG) at $50,000/LYG using inverse probability of censoring weighted linear regression and nonparametric bootstrapping. **Results:** We matched 1,176 patients receiving multi-gene panel sequencing to single-gene controls, achieving good balance on all 21 covariates. Incremental costs in the primary analysis were $6,263 (95%CI: $43, $13,326) and incremental LYG were 0.16 (95%CI: 0.06, 0.24). The INMB at $50,000/LYG was $1,653 (95%CI: -$4,350, $7,010), with a 72.0% probability of being cost-effective. Findings were not sensitive to the evaluative framework based on secondary analyses. **Conclusions:** Implementation of a tumour-agnostic multi-gene panel for advanced cancers is likely cost-effective for health systems. This real-world evidence can inform best practices for tumour-agnostic evaluations and support policymakers in reimbursement deliberations for precision oncology interventions.

Ind-1187 Health, Financial Protection and Equity Impacts of Recent Breast Cancer Policy in the Philippines: An Extended Cost-Effectiveness Analysis

PRESENTER: **Stephen Jan**, The George Institute for Global Health
AUTHORS: Blake Angell, Corazon Ngelangel, Herdee Luna, Alex Chye, Nirmala Bhoo Pathy, Merel Kimman, Soledad Lim, Sanne Peters, Mark Woodward

Introduction

Women in the Philippines experience significant health and economic burdens of breast cancer. The Philippines has reformed financial protection for breast cancer but does not have a national early detection and treatment program. This study aims to evaluate the health and economic impacts of ACT NOW (breast cancer program that navigates women through free early detection to treatment) through an extended cost-effectiveness analysis.

Methods

A microsimulation decision tree model was used to model the ACT NOW intervention (including annual clinical breast examination (CBE); and biannual breast ultrasound (US) for women at high risk of breast cancer) over 5 years for healthy women 40-69 years old. Outcomes included health gains (breast cancer deaths saved), financial protection (financial catastrophes saved), and incremental cost-effectiveness ratios (ICER) (cost per DALY saved). Outcomes were stratified by income group. Probabilistic, one-way sensitivity and scenario analyses explored uncertainty.

Results

Over five years the ACT NOW intervention is cost-effective with an ICER of PHP11,813 (average incremental cost PHP145 [95% UI -156-304] and DALYs saved 0.01 [95% UI 0.01-0.02], below Philippines 2022 GDP per capita PHP178,751). Per 100,000 women, 57 deaths and eight financial catastrophes were saved. Cost-effectiveness did not vary significantly by income, but higher income groups incurred greater costs and lower DALYs. Results were sensitive to proportion of late-stage breast cancers, treatment adherence, intervention costs and downstaging effectiveness. Trade-offs are apparent between government contributions to financial protection and rates of financial catastrophe.

Conclusions

Early detection interventions (annual CBE, biannual breast US if at high risk of breast cancer) are likely to be highly cost-effective, reduce breast cancer related mortality through detection at earlier stages; and modestly effective in reducing the incidence of financial catastrophe. Further research is required to establish the best implementation model to pursue full implementation and ways of designing equity-based screening interventions.

8:30 AM –10:00 AM MONDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Jakarta B

Health and Wellbeing Impact of Elderly Care Programs

MODERATOR: **Audrey Laporte**,

Ind-419 The Golden Years' Dividend: Exploring the Effects of Old Age Allowances on Nursing Home Expenditures and Disability

PRESENTER: **Zining Liu**, Central University of Finance and Economics
AUTHORS: Xiao Han, Hong Liu

As the global population continues to age, the proportion of elderly individuals, particularly those aged 80 and older, is increasing rapidly in both developed and developing countries. In response, many nations have implemented welfare programs to support the elderly, including long-term care subsidies and non-contributory pensions. This paper examines the impact of a non-contributory old age allowance in China, which provides elderly individuals with a monthly cash transfer of 100 Yuan upon reaching the age of 80, regardless of their health status. Using administrative data on all elderly residents in nursing homes registered with the Beijing Municipal Civil Affairs Bureau (BMCAB) between 2021 and 2024, we employ a regression discontinuity (RD) design to exploit the age eligibility cutoff for receiving the allowance. This quasi-experimental approach enables us to estimate the causal effects of the old age allowance on two key outcomes: expenditures in nursing homes and changes in disability status. Our analysis reveals three primary findings. First, we find that receiving the old age allowance leads to an increase in nursing home expenditures of approximately 413 Yuan, or 6.1%, which is significantly higher than the 100 Yuan allowance amount. This effect is robust across various model specifications, including non-parametric estimations and alternative bandwidths. We also observe that this increase is more pronounced among certain subgroups, including men, individuals who lived with others prior to admission, those with a son as their guardian, and those with social health insurance. Second, we explore the mechanisms driving this increase in expenditures and find that elderly individuals receiving the allowance tend to choose more expensive accommodations. Instead of opting for higher levels of institutional care or increased spending on food and personal care, they prefer to invest in better living arrangements and select healthier companions who can provide peer-to-peer support. Third, we find that the old age allowance has a positive impact on health outcomes: it reduces the likelihood of disability deterioration by more than 10 percentage points among healthier elderly individuals. This effect remains

robust even after controlling for potential confounders, such as the length of stay in the institution and the potential manipulation of disability ratings. This study makes three important contributions to the literature. First, it provides new evidence on the effects of non-contributory cash allowances on expenditures in nursing homes, distinguishing it from previous studies that have focused on in-kind subsidies. Second, it examines the effects of such allowances on health outcomes, particularly disability ratings, offering insights into how relatively low-cost welfare programs can improve elderly health. Finally, the paper identifies potential mechanisms through which cash transfers may enhance health outcomes, such as changes in institutional care choices and the health status of co-residents. In conclusion, this research contributes to the growing body of literature on elderly welfare programs and offers valuable insights for policymakers seeking to balance healthcare expenditures while improving the well-being of an aging population.

Ind-1777 The Impact of the Victorian Healthy Homes Program on the Quality of Life in the Older Population: A Randomized Controlled Trial in Australia

PRESENTER: **Dan Liu**, University of Technology Sydney
AUTHORS: Patricia Kenny, Lutfun Hossain, Katie Page, Kees Van Gool, Rosalie Viney

Background: The relationship between the home environment and health outcomes has garnered significant attention, with a growing body of evidence underscores the pivotal role that the physical, social, and psychological aspects of the home play in influencing health and well-being. However, robust causal evidence linking the health and wellbeing benefits of home upgrades is lacking in the Australian setting. Results across countries may vary due to differences in climate, the quality of the housing stock and existing levels of energy efficiency. This is the first study to addresses this evidence gap. **Objectives**: The Victorian Healthy Homes Program (VHHP) is Australia's first randomized controlled trial (RCT) examining the impact of thermal home upgrades on health outcomes in vulnerable older adults. The program aimed to provide home upgrades for 1,000 households (1,300 individuals), offering up to $3,500 per household to improve thermal comfort and energy efficiency. This paper investigates the impacts of the VHHP on 22 outcome measures derived from three quality of life (QoL) instruments. **Methods**: The VHHP was implemented over three years using a staggered, parallel-group clustered RCT. Households were assigned to either an intervention group, receiving a home upgrade before winter (July – September) in 2018-2020, or a control group, receiving an upgrade after winter. Surveys collected data on demographics and QoL. Self-reported QoL was assessed using three established instruments. The 5-level EQ-5D version (EQ-5D-5L) measures health on five dimensions: mobility, personal care, usual activities, pain/discomfort and anxiety/depression. The 36-Item Short Form Health Survey (SF-36) measures health on eight dimensions: physical functioning, role functioning, bodily pain, general health, vitality, social functioning, role emotional and mental health. The Adult Social Care Outcomes Toolkit (ASCOT) measures individual's QoL that can be affected by social care, with eight dimensions measured by nine items: control over daily life, personal cleanliness/comfort, food and drink, personal safety, social participation, employment/occupation, accommodation cleanliness/comfort, and dignity (two items). We applied ordered logistic regression for categorical outcomes and Ordinary Least Squares (OLS) regression for continuous outcomes. Survey data were analyzed before and after winter, with adjustments for age, sex, location, and year fixed effects. **Results**: As a result of the home upgrade, overall QoL in the intervention group significantly improved during the winter period. Key drivers of these improvements, as measured by the SF-36, were changes in mental health and physical functioning. Additionally, the ASCOT measure revealed that accommodation had the greatest impact, with the intervention group reporting greater improvements in the cleanliness and comfort of their homes compared to the control group. **Conclusion**: This study shows that modest investments in housing improvements yield significant health and wellbeing benefits, particularly for vulnerable individuals. Enhanced mental health and QoL, especially in winter, are likely to persist due to the lasting nature of the upgrades. Large-scale, non-health-focused interventions can substantially improve wellbeing and should be prioritized by governments aiming to enhance public health. By recognizing the links between housing and health, policymakers, urban planners, and healthcare professionals can develop strategies to create healthier living environments.

Ind-2251 Effects of Medicare Advantage on Healthcare Use and Outcomes: Evidence from Public Retiree Health Benefits

PRESENTER: **Jose Escarce**, University of California-Los Angeles (UCLA)
AUTHORS: Victoria Shier, Rushil Zutshi, Peter Huckfeldt, Tyler Boese, Neeraj Sood, Helen Parsons

Medicare beneficiaries choose to receive coverage from traditional Medicare (TM) or through private Medicare Advantage (MA) plans. Starting in 2023, a majority (51%) of Medicare beneficiaries were enrolled in MA rather than TM. The Centers for Medicare and Medicaid Services (CMS) pays MA plans fixed monthly capitated payments to cover nearly all health care for enrollees. As MA plans keep the portion of payments not used on to provide health care (or lose money if spending is above the capitated payment), they have financial incentives to reduce health care use. In addition, MA plans have tools to reduce spending that are not present in traditional Medicare, such as establishing restricted provider networks and requiring prior authorization for services. However, financial incentives under capitation could lead to reductions in needed care. Prior research has found that MA enrollees have lower healthcare spending than TM enrollees, with fewer admissions for hospital and post-acute care but more preventive care visits, and mixed evidence on quality of care. However, recent research has been primarily cross-sectional and could be subject to selection bias, especially given that MA enrollees have been shown to be healthier than TM enrollees, even conditioning on observed health. ` `We investigate the causal effects of MA on healthcare use and patient outcomes utilizing a natural experiment. We studied 221,000 retired state employees in five states (AL, AZ, CO, CT, NJ) where retiree health benefits were shifted from state-sponsored supplemental "Medigap" plans (covering the extensive cost sharing in TM) to mandatory MA plans between 2017 and 2019. This natural experiment creates variation in MA enrollment that is independent of health status and thus avoids selection bias. State workforces include a diverse set of occupations and are broadly representative of older adults enrolled in Medicare. As a comparison group, we use retired state employees in ten states that continuously offered Medigap plans over this period. We estimate synthetic difference-in-difference models which assign weights to each comparison state to match the pre-policy trends of each "treatment" state. ` `After states shifted retiree health benefits from Medigap plans to MA, we find that 77% to 98% of retired state employees enrolled in MA across the 5 states in our sample. We find consistent evidence that MA enrollment led to higher rates of home evaluation visits and reductions in inpatient rehabilitation facility use. Other effects vary more across states: for example, MA enrollment increased annual wellness visits in two states but reduced them in two other states. We find mostly small and/or statistically insignificant effects for evaluation and management visits, hospital

admissions, and patient outcomes (institutional days and mortality) across states. Overall, our results show that MA increased use of certain outpatient services and reduced use of post-acute care without affecting the patient outcomes we observed, suggesting greater efficiency. However, future work should focus on outcome measures with greater sensitivity. The heterogeneous effects across states imply that no two MA plans are the same and that average effects may mask substantial variation.

Ind-2167 Evaluating an Integrated Care Model Targeted with Predictive Models to Reduce Readmission, Mortality, and Nursing Home Admission in Elderly Patients

PRESENTER: **April Yushan WU**
AUTHORS: Xia Nan, Eng-kiong Yeoh, Susan Zi-may Yau, Evora Hailin Zhu, Vivian Lou, Yingyao Chen

Introduction: As populations age and healthcare needs become more complex, health and social care systems are restructuring services to better accommodate patients with both poor functional status and significant healthcare needs. Hong Kong's public hospitals have introduced a territory-wide program called Integrated Care Management (ICM) to provide comprehensive medical-social care for discharged vulnerable elderly patients. This program encompasses thorough discharge planning, post-discharge rehabilitation, home support services, and caregiver training, all coordinated by link nurses and a multidisciplinary team. Additionally, a validated readmission risk prediction model is employed to identify high-risk patients and target them for the program. All elders aged 65 years and above with a risk score above 0.2, or those referred by clinicians, who are discharged from Hong Kong's public hospitals will be included in the program. **Objective:** To evaluate the association of ICM with hospital readmissions, emergency department (ED) visits, mortality, length of stay, and institutionalization in residential care homes among elderly patients post-discharge in Hong Kong. **Methods:** A population-based matched cohort study using propensity score matching was conducted to compare outcomes among community-dwelling patients aged 60 or above who received ICM services post-discharge from public hospitals in Hong Kong from 2012 to 2019.** Primary outcomes included post-discharge readmissions, mortality, and ED visits at 30-, 90-, and 180-days post-discharge. Secondary outcomes included the length of stay of index admissions and subsequent institutionalization in residential care homes. **Results:** A total of 47,190 ICM patients were matched with 1,182,129 non-ICM patients. The ICM program was associated with significant reductions in 30-day readmissions (adjusted OR = 0.45; 95% CI 0.43-0.46) and ED visits (adjusted OR = 0.53; 95% CI 0.51-0.55), but not in 30-day mortality (adjusted OR = 1.03; 95% CI 1.01-1.04). Significant reductions in mortality were observed at 90 days (adjusted OR = 0.87; 95% CI 0.82-0.92) and 180 days (adjusted OR = 0.84; 95% CI 0.80-0.87). The program also resulted in a slight increase in the length of stay (IRR = 1.03; 95% CI 1.01-1.04) and a lower incidence of institutionalization in residential care homes within six months post-discharge (adjusted OR = 0.73; 95% CI 0.71-0.75). Subgroup analyses indicated that mortality benefits were primarily observed in patients aged 80 and above. **Conclusions:** The medical-social integrated transitional care program was associated with reductions in healthcare utilization, institutionalization in nursing homes, and mortality within six months. The comprehensive design, involving coordinated social and health services and targeted interventions for high-risk patients, likely contributes to these outcomes. Further research with quasi-experimental design is warranted to further validate these findings, and compare the ability of healthcare professionals and predictive models in identifying the patients most in need.

8:30 AM –10:00 AM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Nusa Dua

Advancing Economic Evaluation for Health Policy and Implementation

MODERATOR: **Kavita Singh**,

Ind-2631 Unpacking Modular Payment Mechanism of Lead Maternity Carer Service in Aotearoa New Zealand: Qualitative Approach in a Realist Economic Evaluation

PRESENTER: **Olawale Joshua Oladimeji**, Obafemi Awolowo University
AUTHORS: Tim Tenbensel, Paula Lorgelly, Karen Bissell

Background

Payment mechanisms are critical to all stakeholders and have been applied to various healthcare services. Several payment mechanisms exist for maternal health services, and in most countries, there is more than one payment mechanism for funding maternity care. In New Zealand, the modular payment mechanism, a form of bundled payment, is applied to fund the Lead Maternity Carer (LMC) Service, which provides maternity services nationwide. Despite the growing body of knowledge on payment mechanisms, there is limited use of qualitative approach in economic evaluation and limited evidence from an economic lens on what works, how, why, and under what circumstances. In addition, in spite of its establishment almost thirty years ago, there is a paucity of evaluation of the LMC modular payment mechanism, and little is known about the effects of modular payment on service providers' workforce capacity. This study aims to apply a qualitative approach to explore how the economic-sensitive context and mechanisms of the modular payment system trigger outcomes and the effects of modular payment on workforce levels.

Method:

Realist economic evaluation (REE) provides the overarching approach for this research. A** sequential exploratory mixed method design is applied in this research. The research comprised three phases, and this study is phase one of the research. This phase includes thirty semi-structured interviews with Policy experts involved with the modular payment mechanism and LMC service providers. NVIVO was used for the data management and thematic analysis was applied to the qualitative data collected, identifying multiple themes and subthemes. Cost-sensitive

contexts and mechanisms of the modular payment system were identified, and economic program theories were developed.

The second phase would employ a quantitative method, including a Discrete Choice Experiment and an economic evaluation. The third phase will be integrating the results in phases one and two.

Findings: (Research ongoing)

Preliminary findings from phase one of the study show some effects of the modular payment mechanism on micro, meso, and macro-level maternity care service in New Zealand. At the micro level (LMC service provider), the effects of the payment system are influenced by the type of health professional, career level, location of practice, population group, and autonomy of practice. Some economic-sensitive contexts and mechanisms at the micro level were the number of clients, opportunity cost for autonomy, business model, payment rate and schedule, retention and recruitment, services paid for, and resources. At the meso level, the establishment and implementation of modular payment were influenced by professional organisations. The macro-level relates to the policymakers and government institutions involved with contracting and modular payment mechanisms. Economic program theories for the modular payment mechanism were developed along demand and supply frameworks.

Implications for policy and practice

Applying qualitative approach in economic evaluation and developing theory-informed economic evaluation can improve policymaking by generating evidence on how and why the cost and consequences differ in health interventions and the alternatives. Developing payment mechanism theories can promote efficiency and strengthen the health system.

Ind-2545 Environmental Impact in HTA: Input-Based Planetary Boundary Life Cycle Impact Assessment

PRESENTER: **Charlie Nederpelt**

Introduction Health systems are committed to provide optimal health and healthcare through access to and delivery of safe, high-quality health services. This introduces a pressure to diagnose, treat and care more and more. Healthcare resource use contributes to transgression of Earth's planetary boundaries (PB), negatively impacting future livability and health outcomes. While finite financial and human resource are explicitly considered, our finite planetary resources are largely omitted from health technology assessments (HTA) and resource allocation decisions. Lifecycle impact assessments (LCIAs) of whole healthcare sectors point to significant impacts. Reducing healthcare's ecological impact, however, occurs in trade-offs between specific interventions or inputs by healthcare providers in clinic, in guideline committees, by facility administrators, and in reimbursement decisions. To enable incorporation of PB impacts into these trade-offs, we present our estimation framework for PB-LCIA, in tandem with suggested reporting of impacts for health services. **Methodology** The LCIA framework captures all stages from production, transport, storage, preparation, use, to recycling and disposal for each service input. We used the Universal Health Coverage Compendium input structure, containing type and frequency of i) consults, ii) admissions, iii) procedures, iv) medicine, v) in vitro diagnostics and vi) consumables. The impact of facility- and system-level overheads is estimated based on LCIA of lighting, temperature control, ventilation, air-conditioning, IT consumption, and equipment use. For each ingredient, unit impact estimates are generated toward each of the PBs with thresholds and impact metrics: - Climate change (CO_2-emissions), - Biogeochemical flows (phosphorus, nitrogen and CO_2-emissions), - Atmospheric aerosol loading (aerosol emissions), - Stratospheric ozone depletion (ozone-depleting substance emissions), and - Freshwater change (H_2O consumption). External validity will be assessed crudely by comparing the alignment of PB-LCIA domains of essential healthcare services to previously published top-down, multi-regional input-output modelling estimates, primarily for CO_2-emissions, in the United States, United Kingdom, Canada, Australia, Japan, China and The Netherlands. **Conclusion** This study presents an initial ingredient-based lifecycle impact assessment framework for the impact of essential health services on planetary boundaries. Methods presented are an intended starting point for further contextualization using localized data. National and institutional health technology assessments, clinical guidelines, and reimbursement and resource allocation decisions urgently need to formally incorporate planetary impacts of healthcare.

Ind-165 Evaluating Task Shifting and the Role of Economic Evaluation

PRESENTER: **Peter Murphy**, University of York
AUTHORS: Simon Walker, Helen Fulbright, Susan Griffin

Introduction The realisation of universal health coverage is dependent on the adequate supply of trained health workers. Task shifting has often been proposed as a potential approach to address shortages of specific cadres of health worker by reallocating tasks (or care) to those workers with different, typically lower, levels of training. An increasing body of literature evaluates the effect of such task shifting, however, there is limited evidence on whether it represents value for money in the long run. A systematic review found a broad range of task shifting in LMICs resulted in immediate cost savings, yet the evaluations failed to account for the full range of costs and consequences of task shifting. To address limitations identified in the scope of these previous evaluative studies, we ask what are the key issues to consider when conducting an economic evaluation of task shifting in healthcare and how best to design studies to evaluate task shifting? **Methods** We first reviewed the literature describing the economic theory that underpins task shifting. This allowed us to develop a logic model describing the consequences of task shifting. The logic model was then refined through an expert workshop. Next, we conducted a rapid review of applied economic evaluations of task shifting using the principles of standard systematic reviewing. We searched 5 databases (Medline, Embase, EconLit, Social Sciences Citation Index and CEA Registry) for studies published between January 2014 to March 2024. Forwards and backwards citation searching was performed on included studies. We then considered the scope of the evaluations with respect to the ability to capture impacts of task shifting on key costs and outcomes. Results were then narratively synthesised. **Results** The logic model detailed the inputs, outputs and short-, intermediate- and long-term** outcomes which can occur as a result of task shifting but, in some cases, reflect the mechanisms to help capture the outcomes of interest. The outcomes are categorised into those that impact capacity, those that impact health workers, those that impact patients and wider effects. The rapid review identified 26 studies included in the synthesis covering 16 countries and 4 different approaches to economic evaluation although the majority were cost-effectiveness analyses (n = 23). The economic evaluations captured aspects included in the logic model such as patient health outcomes, staff costs and training costs but showed limited inclusion of aspects such as

change in capacity, access to care and health equity. **Conclusions** This research presents one of the first attempts to formalise the potential costs, consequences and mechanisms of task shifting. In doing so we highlight several that may ultimately impact population health and health equity and that have been routinely omitted in previous study designs and evaluations. It is hoped with this research that future economic evaluations of task shifting may more formally consider previously uncaptured aspects of task shifting relevant to economic evaluation to allow for the full consideration of the costs and consequences to inform decision making.

Ind-2504 Cost Estimation For Implementation And Maintenance of Oral Health Teams in The Brazilian Public Health System

PRESENTER: **Everton Nunes da Silva**, University of Brasilia
AUTHORS: Ana Carolina Esteves da Silva Pereira, MARIANA Marzullo M PEDREIRA, Alessandra Gaspar Sousa, Luis Eduardo Maciel dos Santos Ferreira, Gustavo Laine Araújo de Oliveira, Ivanessa Thaiane do Nascimento Cavalcanti, Harrison Floriano do Nascimento, Ms. Erika Aragao

Abstract: This study aimed to estimate the implementation and maintenance costs of Oral Health Teams (OHT) in Brazil's Unified Health System (SUS), considering different team types, weekly workloads, and regional variations. A microcosting methodology was applied using 18,466 valid procurement records from 2022 and 2023, covering 264 items including consumables, medications, and equipment. Additionally, 333 valid responses were collected from municipal health managers to estimate monthly quantities used by team type. The average investment required to implement a Type I OHT was USD 12,466.56, ranging from USD 11,821.52 in the Midwest to USD 12,819.10 in the South. This value includes one dental chair, estimated at USD 2,820.97, provided by the Ministry of Health. The national average monthly operating cost (COpM) was USD 1,495.51, with the highest observed in the North (USD 1,731.92) and the lowest in the Northeast (USD 1,411.62). Consumables represented the largest portion of COpM, followed by third-party services and medications. Human resources costs (CRH) varied widely across regions. The national average salary for a 40-hour-per-week dentist was USD 1,319.01, ranging from USD 846.95 (Northeast) to USD 1,905.49 (South). For oral health assistants, salaries ranged from USD 310.99 to USD 601.06, with a national average of USD 443.92. Total monthly costs (COpM + CRH) for Type I teams were USD 2,610.61 (20h), USD 2,908.03 (30h), and USD 3,259.56 (40h); for Type II teams (40h), the total was USD 4,355.38. The analysis indicated economies of scale, with reduced cost per hour in teams with longer weekly workloads, suggesting increased efficiency. Although equipment depreciation had limited monthly impact, long-term planning is required to ensure quality service continuity. Regarding federal funding, monthly transfers covered between 24.89% and 63.22% of the COpM, and between 14.26% and 30.09% of the total cost (COpM + CRH), depending on the team type and workload. At implementation, the federal contribution — composed of a BRL 14,000 transfer (USD 2,596.47) and donation of one or two chairs — covered 43.45% of implementation costs for Type I teams and 48.88% for Type II. Remaining investments must be provided by state and local governments. The findings indicate that maintaining OHTs involves significant and regionally variable costs, reflecting differences in input prices, salaries, and local infrastructure. Current federal transfers cover only part of actual costs, emphasizing the need for effective co-financing and coordinated planning among government levels to ensure sustainable and quality oral health services within the SUS.

Keywords: Oral Health, Costing, Microcosting, Financial Sustainability, Brazilian Unified Health System.

Ind-1430 League Tables Based on Cost-Effectiveness Estimates of 132 Interventions in 204 Countries: A Meta-Regression Approach

PRESENTER: **Marcia Weaver**, University of Washington
AUTHORS: Fiona Silke, Jessica Klusty, Johnathan Hsu, Aishe Memetova, Lauren Earl, Esha Dwibedi

Background. The goal of cost-effectiveness analysis (CEA) is to rank interventions across diseases from the lowest to the highest incremental cost-effectiveness ratio (ICERs) within the context of a country's economy and health system. The rankings, referred to as league tables, can guide national decision-makers to allocate funding to the intervention with the lowest ICER first, and add interventions according to their rank and available funds. The goal is rarely achieved, because most researchers create CEA models for a single disease with a focus on a few interventions in a single location or a single intervention in multiple locations.

Research questions: Can we use meta-regression methods, which are used extensively to synthesize clinical evidence, to synthesize evidence from economic evaluations, predict country-specific ICERs for multiple interventions, and create country-specific league tables?

Methods. Data are from the Tufts University's cost-effectiveness registries through 2020 with health improvements measured in disability-adjusted life-years (DALYs) or quality-adjusted life-years. We included interventions with at least two published articles and three published ICERs. We grouped healthcare interventions into 17 broad categories such as medications to lower systolic blood pressure, and estimated 17 meta-regression models using a five-stage meta-regression framework. For each model, the dependent variable is the ICER, and the independent variables are country characteristics such as gross national product and cause-specific burden of disease, and intervention characteristics such as cost (for example drug price), and target group (for example medium to high cardio-vascular risk).

Then, we used the parameter estimates to predict country-specific ICERs for 204 countries. For each intervention, we predict median ICER, interquartile range (IQR), and 95% uncertainty interval in 2019 US dollars. We place ICERs in context of a league table and two measures of affordability: GDP per capita, and a country-specific opportunity cost from Pichon-Riviere et al (The Lancet Global Health, 2023).

Key Results. Parameter estimates from 17 models are used to predict country-specific ICERs for 132 interventions. League tables show that many interventions for non-communicable diseases have relatively low ICERs. For example, in India the median ICER for diuretics to lower systolic blood pressure for people with medium to high cardiovascular risk is $74 (IQR: 46, 122) per DALY averted, comparable to zinc and

iron biofortification of rice. The median ICER for ACE inhibitors and diuretics combined for that risk group is $222 (IQR: 157, 359) per DALY averted, comparable to rotovirus and measles vaccines. The country-specific opportunity cost is $523, and GDP per capita is $2093; the interventions are good options by multiple criteria. The median ICER for ACE inhibitors alone for that risk group is $448 (IQR: 282, 749) per DALY averted.

Conclusions. Meta-regression is a promising method to produce country-specific ICERs and league tables. Countries with respected health technology assessment agencies may want to use our estimated ICERs for interventions with many published CEA; they could focus their original research on newer interventions or those without published CEA. Countries that don't have health technology assessment agencies may want to use our estimates for ranking and selecting healthcare interventions.

Ind-1090 Cost-Effectiveness of On-Site Chlorine Production in Health Facilities of Ghana and Uganda:Strategies to Address Infection Prevention and Control Gaps

PRESENTER: **Teddy Naddumba**, PATH

Background: Use of chlorine as a disinfectant is recommended for hospital surfaces and medical instrument decontamination. Chlorine is efficacious in eliminating a wide variety of microbial pathogens that contribute to health care–associated infections (HAIs). However, chlorine access and availability remain a challenge in health care settings in low- and middle-income countries due to supply chain bottlenecks, low- or degraded-quality chlorine products available on the market, and knowledge gaps among health care staff on the correct dilution of chlorine to achieve the recommended concentration levels for medical equipment and surface disinfection. Health facility–level production of chlorine using the Aqua Research STREAM™ Disinfectant Generator (STREAM) can mitigate supply chain and quality issues. STREAM uses electrolysis processes to convert salt and water into a 5,000 mg/L chlorine solution, producing an adequate supply at the required 0.5% concentration to meet daily needs. Our study aimed to evaluate the potential cost-effectiveness of on-site chlorine production using the STREAM device in health facilities in Ghana and Uganda, compared to purchasing commercial chlorine. **Study design:** We used a static model to evaluate the benefits, cost, and cost-effectiveness of using STREAM-generated chlorine compared to commercial chlorine in health centers and primary and secondary hospitals in Ghana and Uganda. Published literature and STREAM evaluation data from both countries informed the development of a causal framework and statistical model on the effect of chlorine availability, chlorine quality, and effectiveness of disinfection practices on HAIs. Using primary data from ten health facilities in Ghana and Uganda respectively, we evaluated the benefits of on-site production, such as improved quality, elimination of chlorine stockout days, and impact on chlorine costs. We used secondary data to evaluate cost-effectiveness by modeling the potential reduction in HAIs, disability-adjusted life years (DALYs), and costs. Costs per DALY averted were estimated for two scenarios: (1) health facilities using commercial chlorine and (2) health facilities using the STREAM device to produce chlorine. Costs and outcomes were analyzed from the health system perspective over a one-year time horizon, and all costs were reported in 2023 US dollars. Incremental cost-effectiveness ratios were compared with willingness-to-pay thresholds based on gross domestic product per capita of $2,206 for Ghana and $934 for Uganda. **Results:** Our study showed that 50% infection prevention and control coverage using STREAM-generated chlorine could reduce HAIs by 5,365 in Ghana and 11,536 in Uganda and avert 103 and 56,280 DALYs in each country, respectively—resulting in treatment cost savings of an estimated $2,284,509 in Ghana and $3,883,885 in Uganda. **Conclusions:** These findings suggest that on-site chlorine production using the STREAM device has the potential to eliminate chlorine supply bottlenecks and quality issues, which inhibit the effectiveness of infection prevention and control practices at health facilities in LMICs, and consequently reduce the number of HAIs, DALYs, and associated treatment costs.

Ind-708 The Use of Cost-effectiveness Thresholds for Evaluating Vaccinations in LMICs and the Implications of Health-Opportunity Based Thresholds

PRESENTER: **Lynn Daryl Feliciano Villamater**
AUTHOR: Natalie Carvalho

Background Introducing new vaccines presents significant challenges for low- and middle-income countries (LMICs) with constrained resources and competing health priorities. In the absence of locally established cost-effectiveness thresholds (CETs), Gross Domestic Product (GDP) per capita has often been used in CEAs of health interventions. Recently, health opportunity cost-based have been proposed as more appropriate for budget-constrained health systems. However, their application and impact on vaccination CEAs in LMICs remain unexplored. While prior studies have examined CETs in health intervention CEAs broadly, none have focused specifically on vaccination CEAs or the adoption of opportunity cost-based CETs in LMICs. This study aims to: (1) identify commonly used CETs in vaccination CEAs in LMICs, (2) assess the impact of applying opportunity cost-based CETs, and (3) examine the association between country income levels and changes in cost-effectiveness conclusions using these newer CETs. **Methods** A literature review of vaccination CEAs from the Global Health Cost-effectiveness Analysis Registry published between May 15, 2017, and May 25, 2022, was conducted. The review was restricted to vaccine studies in LMICs reporting country-level incremental cost-effectiveness ratios (ICER), with explicit CET use and cost-effectiveness conclusions. Descriptive statistics summarized the study characteristics and the CET distribution by study, intervention and income levels. For the quantitative analyses, country-specific CETs were calculated by multiplying the GDP per capita by upper and lower bound CET estimates from studies by Woods et al., Ochalek et al., and Pichon-Riviere et al. Proportions of cost-effective conclusions were compared with proportion of conclusions using the newer estimates. Chi-square test and logistic regressions examined the relationship between income groups and changes in cost-effectiveness conclusions, and the differences between income groups, respectively. **Results** The review included 68 studies with a total of 413 interventions. 1-3x GDP was the most frequently (76%) used CET in vaccination studies. A large proportion of interventions (69%) referenced 3x GDP per capita, with the highest use observed in upper-middle-income countries. Low-income countries primarily used 1x GDP per capita (n=45). Vaccination CEAs started to reference opportunity-based thresholds in 2017, with a significant increase in 2020 and 2021. While 76% of interventions were initially deemed cost-effective, this declined to 45-48% and 21-39% after comparison to upper and lower opportunity-cost estimates, respectively. A significant association was observed between income level and changes in cost-effectiveness conclusions, with upper-middle-income countries having the highest likelihood of change compared to low-income countries. **Conclusion** GDP-based thresholds remain the most commonly used in vaccination CEAs despite their limitations. Health opportunity cost-based thresholds

have gained traction in recent years. Reliance on GDP-based thresholds may overestimate cost-effectiveness, potentially hindering vaccination program implementation in LMICs due to issues of affordability. This review highlights the need to reassess CET frameworks and adopt more contextually relevant thresholds in assessing cost-effectiveness of vaccination programs in LMICs. Decision-makers and researchers should consider alternatives to GDP-based thresholds to ensure accurate and effective CEA practices and optimize resource allocation in LMICs.

Ind-1921 Cost-Benefit Analysis of an Electronic Medical Record System in an Emergency unit based Private Practice in South Africa

PRESENTER: **Natasha Banda**

AUTHOR: Evelyn Thsehla

Background In South Africa, various electronic medical records systems (EMRS) have been implemented in both the private and public healthcare sectors. Currently, there is a lack of evidence on the economic consequences of adopting EMRS in the South African context. The aim of this study was to estimate the cost-benefit of adopting EMRS in an emergency unit setting. **Methods** A retrospective cost benefit analysis was conducted to ascertain the economic consequences of EMRS use compared to a Paper-based Medical Records System (PMRS) in a private medical practice which runs 25 emergency units in South Africa. The EMRS was implemented in these emergency units from 2019, with full implementation completed by end of 2021. Costs data was collected from existing records and from interviews with experts where data was not available. Costs for the EMRS included development costs, hardware costs, installation costs, training costs, software costs, personnel costs, and printing costs. Costs for the PMRS included costs for stationery, storage space, transportation and personnel. The measured amounts were discounted by the expected interest rate and inflationary adjustments made using the consumer price index (CPI), to calculate the net present value (NPV), benefit-cost ratio (BCR), and discounted payback period (DPP). The benefits included cost reductions after EMRS adoption. The time horizon used for the analysis was from 2017 to 2024. **Results** Out of the 25 emergency units currently being managed by the practice, 18 were identified to have been under the practice's management from January 2018 till June 2024 and were thus selected as part of the sample. Over the period 2018 to 2024, PMRS costs decreased by 85% from R2,868,554.60 (US$153,948.35) in 2018 to a predicted cost of R423,186.45 (US$22,711.39) in 2024. The total cost for the EMRS implementation and maintenance was estimated at R11,396,872.79 (US$611,642.45). From the start of implementation in 2019 till 2024, the total cost savings for the study sample were R6,668,580.76 (US$357,886.51). A NPV of -R4,728,292.02 (-US$253,755.94) and a BCR of 0.59 were estimated. The DPP was approximately 6.97 years. **Conclusion** Even though the adoption of the EMRS resulted in reduction of PMRS costs, the EMRS was shown not to be cost effective over the study period. Post-implementation, it is expected to take almost 7 years for the practice to breakeven with the EMRS intervention. Reducing EMRS costs and further reducing concurrent PMRS usage may potentially result in the intervention being more cost-effective.

Ind-555 A Systematic Review of Economic Evaluation Studies Assessing Regulatory Options For e-Cigarette Use

PRESENTER: **Louisa Collins**

AUTHORS: Daniel Lindsay, Tan Doan, Anita Lal, Joachim Schuz, Michelle Scollo, Michelle Jongenelis

Background: Governments around the world are considering regulating access to e-cigarettes containing nicotine to prevent uptake among youth. However, people that smoke tobacco may use e-cigarettes to assist with smoking cessation. Due to their relatively recent development, the actual long-term health and cost implications of regulating e-cigarette use among populations are unknown but have been explored in modelling studies. We systematically reviewed health economic evaluation and simulation modelling studies that assessed long-term health and economic consequences, interpreting their potential usefulness for key policy- and decision-makers.

Methods: We undertook a systematic review with an additional narrative synthesis. Six databases were searched for modelling studies evaluating population-level e-cigarette control policies or interventions restricting e-cigarette use versus more liberalized use. To be included in the review, studies were required to report the outcomes of life years, quality-adjusted life years (QALYs) and/or healthcare costs. The quality of the studies was assessed using two quality assessment tools, the Ten Rules of Credible Practice of Modeling and Simulation in Healthcare and the CHEERS checklist.

Results: In total, 15 studies were included with nine from the United States and one each from the United Kingdom, Italy, Australia, Singapore, Canada, and New Zealand. Most studies involved health state transition (or Markov) closed cohort models. Three studies included cost-utility analyses. The majority of studies had limitations with their model structures, data input quality and transparency, and insufficient analyses handling model uncertainty. Findings were mixed with 11 studies concluding that policies permitting e-cigarette use led to net benefits and 4 studies concluding net losses in life-years or QALYs and/or healthcare costs. Five studies had industry conflicts of interest, potentially influencing results.

Conclusions: While more studies reported net benefits than net harms, the significant limitations that we identified with many of the studies in this review make it uncertain whether countries can expect net population harms or benefits of restrictive versus unrestrictive e-cigarette policies. The generalizability of the findings were found to be limited for key policy- and decision-makers. In light of the deep uncertainty around the health and economic outcomes of e-cigarettes, future simulation modelling methods and uncertainty analyses should be strengthened.

abs-os421 Investigating the Intersection of Economic Evaluation and Implementation Science in Healthcare: a Conceptual Framework

PRESENTER: **Aleksandra Torbica**, Università Bocconi

AUTHORS: Kavita Singh, Ms. Manuela De Allegri

Exploring the link between economic evaluation and implementation science highlights a critical, emerging area that aims to bridge gaps between evidence-based practices and the realities of financial decision-making in real-world settings. Economic evaluation provides systematic methods to assess the value of interventions relative to their costs. Implementation science, on the other hand, focuses on studying

methods to promote the integration of research findings and evidence-based practices into healthcare, public health, and policy. When these fields are integrated, they create a robust framework for evaluating not only whether an intervention works but also how to make the intervention affordable, sustainable, and adaptable within different organizational contexts.

In this paper we propose a conceptual framework to foster the integration between the two fields. We argue that this integration is crucial for several reasons. Economic evaluation offers methods to quantify the value by comparing outcomes—such as improvements in health, quality of life, or productivity—with the costs of delivering and scaling them. However, these economic evaluations alone do not always consider the practical challenges of implementing interventions in complex, variable environments, particularly in resource constraint settings of LMICs. This is where implementation science contributes essential insights, by examining the context-specific barriers and facilitators to effective implementation. For instance, even if an intervention is found to be cost-effective in a clinical trial, real-world variables such as implementation factors e.g., inner setting and outer setting factors including availability of trained health workers, institutional culture, organizational leadership, political climate, and funding availability may impact its success or scalability.

Integrating and tailoring economic evaluation methods in implementation studies are pivotal to enhance the sustainability and scalability of proven effective healthcare interventions. However, policymakers and practitioners face the “real world” challenge of deciding not only which programs to fund but also how to allocate limited resources in ways that maximize impact while minimizing waste. An integrated approach enables a comprehensive understanding of both the financial implications and the practical feasibility of scaling up successful interventions. For example, interventions that show high cost-effectiveness in tightly controlled randomized trials may struggle in broader application due to unforeseen costs or operational hurdles. Implementation science, with its focus on adaptability and context and understanding theory of change model, can inform economic evaluations by identifying key factors—such as intervention characteristics, inner setting and outer setting, characteristics of individuals (implementing actors, end users) and implementation process, including local resource availability, stakeholder engagement, and long-term operational needs—that influence the likelihood of sustained success.

Furthermore, the combined approach contributes to equity by ensuring that interventions are evaluated with consideration of different populations and settings. Health disparities are often linked to socioeconomic factors, and the feasibility of implementing interventions greatly vary significantly across communities. A joint approach allows researchers and policymakers to examine whether an intervention is both economically and practically viable in underserved areas, ensuring that cost-effective solutions are accessible to those who need them most.

Bali International Convention Centre – Singaraja

Beyond Treatment Costs: The Hidden Costs of Cancer, Mental Health, and Preterm Birth on Society

MODERATOR: **Philip Clarke**,

Ind-577 The Global Societal Cost of Cancer: Productivity Loss from Cancer Mortality and Morbidity

PRESENTER: **Yek-Ching Kong**

AUTHORS: Phuong Bich Tran, Jerome Vignat, Cindy L. Gauvreau, Alison Pearce, Marianna de Camargo Cancela, Marta Ortega, Nirmala Bhoo Pathy, Mr. Filip Meheus, Ms. Isabelle Soerjomataram

Background: Cancer is one of the most important causes of premature death and morbidity globally. The economic impact of cancer to society is measurable through productivity loss. We aimed to estimate the value of lost productivity from morbidity and premature mortality due to cancer for 36 cancer types in 185 countries. Methods: We estimated productivity loss from paid and unpaid activities due to cancer-related mortality and morbidity for individuals aged 15-64 in 2022. Data extracted include epidemiological data from the Global Cancer Observatory (GLOBOCAN), workforce statistics from the International Labour Organization (ILO) and governmental sources, estimates on absenteeism, presenteeism, and labour force shortfalls from literature review, and unpaid hours spent on care and domestic activities from the United Nations (UN) Women. Productivity loss from paid activities, valued using the human capital approach (HCA), was estimated from years of productive life lost (YPLL) for cancer mortality, and absenteeism, presenteeism and labour force shortfalls for cancer morbidity. Productivity loss from unpaid activities was valued using the opportunity cost method, wherein time use for unpaid activities was valued using the hourly wage of paid work. Results: The values of global productivity loss from cancer-related premature mortality and morbidity in 2022 were US$ 584 billion and US$ 87 billion, equivalent to 0.6% and 0.1% of the global GDP, respectively. Of the total productivity loss from cancer mortality, 53.8% (US$ 314 billion) was attributable to paid activities and 46.2% (US$ 270 billion) to unpaid activities. Meanwhile, 75.9% (US$ 66 billion) of lost productivity from cancer morbidity was from paid activities and 24.1% (US$ 21 billion) from unpaid activities. Regional variations in the relative proportion of productivity loss from paid and unpaid activities towards total productivity loss were observed. For cancer morbidity, more than half of the productivity loss from paid activities was due to labor force shorfalls (57.7%, US$ 38 billion), followed by absenteeism (34.9%, US$ 23 billion), and presenteeism (7.4%, US$ 5 billion). The ratio of paid to unpaid productivity loss differed between men and women; paid productivity loss was generally higher among men while unpaid productivity loss was higher among women. On an aggregate level, lost productivity from premature deaths was largest for lung cancer, followed by breast and liver cancers, whereas lost productivity from morbidity was largest for breast cancer, followed by colorectal and lung cancers. On a per capita basis, deaths from testicular cancer, skin melanoma, and brain and nervous system cancers led to the highest productivity loss on average, while morbidity from skin cancers, prostate cancer, and non-Hodgkin lymphoma resulted in the greatest productivity loss. Conclusion: Productivity loss from cancer-related premature mortality and morbidity is substantial. The sizeable value of productivity loss from unpaid activities reveals the often-overlooked burden borne by individuals outside the formal workforce, especially women, which emphasizes the importance of including both paid and unpaid activities to estimate societal burden more accurately. Continuous investments in cancer control efforts should be prioritized to save lives and minimize

the associated societal impact of cancer-related premature mortality and morbidity.

Ind-17 The Economic Implications of Non-communicable Diseases on Food Security and Resilience in Malawi.

PRESENTER: **Richard Moyo**
AUTHOR: Gowokani Chijere Chirwa

Background In the midst of multiple shocks, Malawi is also facing an increase in non-communicable diseases (Gowshall & Taylor-Robinson, 2018) and ongoing food insecurity(MVAC, 2024). Approximately 4.2 million people are expected to experience high levels of acute food insecurity, including 56,000 people in IPC Phase 4 (Emergency) and 4.1 million people who are in the crisis phase(MVAC, 2024). Additionally, NCDs are now the second leading cause of death among adults in Malawi, accounting for 16% of all fatalities, with a prevalence of 17% in males and 14% in females. Despite the increasing prevalence of NCDs, their specific impact on nutritional status within the context of food security remains inadequately understood.The complex interplay between non-communicable diseases (NCDs), nutrition, and food security reveals a compelling economic linkage. This interconnection manifests itself in several crucial ways. Initially, the financial burden of NCDs, including healthcare costs for diagnosis and treatment, competes with household expenditure on food, potentially limiting access to nutritious options(Nugent et al., 2018). Conversely, Wang et al., (2015) revealed that despite the anticipation of cost-free care at the point of service in Malawi, households in rural areas, particularly those grappling with severe poverty, face considerable financial strain. Additionally, NCDs can diminish individuals' productivity due to illness or disability, resulting in reduced income and constraining their capacity to procure diverse and high-quality foods(Kasambara et al., 2023) **Objective** We assessed the economic implications of non-communicable diseases on food security and resilience in Malawi by utilizing household dietary diversity, the food consumption score, and a reducing coping strategy index. **Methods** The study employed the propensity score matching model and analysed a sample of 11,443 households from the Malawi Household Integrated Survey (IHS5). **Results** The study revealed a multifaceted impact of NCDs on food security indicators. Households with NCD-affected members experienced challenges in accessing a balanced diet, with a decrease in the food consumption score of approximately -0.764 units compared with that of the nonaffected households. Additionally, these households demonstrated an increase in their rCSI score of approximately 1.162 units, suggesting a reliance on reducing coping strategies to address food insecurity. Finally, households affected by NCDs struggled to obtain nutritious meals, with a reduction in their household dietary diversity score of approximately -0.117 units. **Keywords:** Food Security; Noncommunicable Diseases; Propensity Score Matching; IHS5

Ind-580 Educational and Labour Market Trajectories in Adulthood for Very Preterm/Very Low Birth Weight Individuals:Evidence from a Multi-National Cohort Study

PRESENTER: **Hanifa Pilvar**
AUTHORS: Sungwook Kim, Mr. Stavros Petrou, Catia Nicodemo

Background Advances in neonatal care have improved survival rates for very preterm (VP) and very low birth weight (VLBW) infants, but understanding how early-life health disadvantages influence adult outcomes remains limited. While previous research has focused on childhood and adolescent outcomes, few studies have examined impacts in adulthood. This study addresses this gap by analysing the long-term effects of VP/VLBW on adult outcomes across six countries.

Research Aim

The aim of this study is to assess the impact of VP/VLBW status on adult outcomes, specifically focusing on mortality, educational attainment, economic activity, and working hours. Additionally, we examine the effects of each additional gestational week within the VP/VLBW group on adult outcomes.

Data We use data from the RECAP Preterm Project which collects longitudinal data on children born VPT/VLBW. We select a set of geographically diverse cohorts born in developed countries, namely Canada, Germany, the Netherlands, New Zealand, Norway, and the UK. Follow-up surveys were conducted when participants were 24-28 years old, allowing us to assess adulthood outcomes, including mortality, educational attainment, economic activity, and working hours.

Methods

To compare outcomes between VP/VLBW individuals and term-born controls, we apply coarsened exact matching (CEM) for balanced comparisons. For estimating the marginal effect of an additional week of gestational age within the VP/VLBW sample, we employ an instrumental variable (IV) approach using nulliparity as an instrument for gestational age to account for potential endogeneity.

Results

Coarsened Exact Matching (CEM):

Using CEM to compare VP/VLBW individuals with term-born controls, we find that VP/VLBW individuals have a 25 percentage point higher probability of mortality before adulthood. Among those who survive to adulthood, VP/VLBW individuals are 7.1 percentage points more likely to have lower educational attainment. We do not find significant differences in economic activity or working hours.

Instrumental Variable (IV):

The results of the IV method show that each additional gestational week reduces the probability of mortality by 6.8 percentage points, highlighting the critical role of gestational age in survival. However, we do not observe significant effects on other outcomes, such as educational attainment, economic activity, or working hours, in the main model.

Additionally, we explore the interaction between gestational age and the duration of assisted ventilation. This finding suggests that there is a positive impact of gestational age on educational attainment when accounting for the level of assisted ventilation received.

Conclusions These findings underscore that while extending gestational age can enhance survival, economic outcomes in adulthood are likely to depend on other factors, including neonatal care quality. Policymakers should consider holistic support strategies that address both survival and developmental needs of VPT/VLBW.

This research makes a unique contribution by utilizing an international sample of VPT/VLBW individuals from multiple countries. By examining long-term adulthood outcomes, including labour market indicators, we expand the literature beyond childhood and adolescence. Additionally, assessing both the levels of difference between VPT/VLBW and term-born individuals, as well as the marginal effect of each additional week of gestational age, provides a nuanced understanding of how preterm birth affects life outcomes.

Ind-757 Breast Cancer and Income Loss in Denmark: Heterogeneous Outcomes and Longitudinal Effects

PRESENTER: **Emily K Johnson**

AUTHORS: Angela Chang, Harsh Parikh, Liza Sopina, Kim Rose Olsen

0.1. Background

Income loss due to breast cancer is an important area of research, and prior causal studies in Denmark using register data have found modest loss in the working population within 5 years of diagnosis. However, the long-term effects and heterogeneous impacts of breast cancer on income across the population are understudied. The purpose of this study is to estimate the population-level, longitudinal effects of breast cancer on income in Denmark, and to identify socio-economic and demographic populations for whom income loss is the most disproportionate.

0.2. Methods

We use Danish register data to measure the effect of breast cancer on personal and household equivalized income in Denmark from 2000-2018. We adopt a cohort study design and match on age, baseline income, employment, baseline health, and other socio-demographic variables to investigate heterogeneous effects across sub-populations over a 10-year period. For validation, we also perform an event study difference-in-difference analysis which estimates income loss compared to a control population at each year following diagnosis. We additionally compare our estimates to those derived from matching methods along fewer matching variables, and we estimate personal income loss if mortality before retirement age is considered years of 0 income.

0.3. Findings

We measure personal income loss over 10 years amounting to €7138 (95% CI €6777 – €7498) per capita in the non-retired population and totaling €206.73 million across the population from 2000-2018. The working population, students, and individuals with comorbidities or high healthcare utilization experienced disproportionate loss. Household income losses are smaller at €1544 (€1233 – €1856) per capita, and annual losses recover within the period of observation. Event study difference-indifference results were consistent with the matching study indicating robustness to unobserved confounding in the primary estimates. Matching along fewer variables produced lower estimates of loss, indicating the potential presence of confounding when baseline socioeconomic status and health are not accounted for. Total mortality was higher in the breast cancer population than in the control, and accounting for premature mortality produced substantially higher estimates of income loss due to breast cancer.

0.4. Interpretation

Overall, the Danish economic protections are effective in mitigating long term economic impact of breast cancer on the population, and income losses are recoverable over time. However, there is room for improvement in protection of the most vulnerable groups including those early in their careers or in poor baseline health, who suffer substantial and persistent long-term economic impact.

8:30 AM –10:00 AM MONDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Nusantara 1

Variation in Quality, Organization, and Efficiency of Care Delivery

MODERATOR: **Alistair McGuire**,

Ind-961 Exploring Change in Health Care Delivery System Value for 50 US States over Three Decades: 1991-2020

PRESENTER: **Maitreyi Sahu**, University of Washington

AUTHORS: Haley Kathryn Lescinsky, Kevin Schulman, Arnold Milstein, Joseph Dieleman

While the US as a whole spends more on healthcare per person than most peer countries, there is dramatic variation within the US. Moreover, health outcomes also vary dramatically, although they are only weakly correlated with healthcare spending. In this study, we leverage variation in healthcare spending and health outcomes to estimate state-level healthcare delivery system value after accounting for underlying differences

in population risk (ie age, obesity, smoking, etc). Then we examine trends in value over the last 30 years and identify key policies and characteristics associated with value following the enactment of the Affordable Care Act.

We extracted annual health condition-specific death and prevalence estimates for each US state from the Global Burden Disease 2020 Study for 1991 to 2020. We used state-level annual healthcare spending per person from the State Health Expenditure Accounts (SHEA) for 1991 to 2020. Using meta-stochastic frontier analysis, condition-specific mortality-prevalence ratios for 66 major treatable illnesses were regressed on per capita healthcare spending and key covariates including age, obesity rate, smoking rate, physical activity rate, and educational attainment. State- and year-specific inefficiency estimates were extracted for each health condition and combined to create a single estimate of healthcare delivery system value for each US state for 1991 through 2020. We also extracted data from the American Hospital Association to generate a state-specific measure of hospital market concentration. The association between changes in healthcare value and 30 key healthcare system characteristics and state health polices was measured using bivariate linear regression, with specific focus on market concentration for large, small, and individual group insurance plans, as well as hospital market concentration.

Across US states, delivery system value on average increased from 1991 to 2010, and then declined by 17% from 2011 to 2020. Over the three-decade span, the states with the most favorable value trajectories were California, New York, and Washington, and states with the most pronounced declines were South Dakota, Arkansas, and Mississippi. When looking at absolute healthcare value, New Hampshire, California, and Minnesota attained the highest scores in 2020. The percentage of state populations insured was strongly associated with value, while greater market concentration of insurers and hospitals were associated with worse healthcare value, as were increases in insurance premiums and hospital expenses. The net effect of increasing market consolidation among hospitals and insurers in the last decade, despite increasing insurance coverage, was a reduction in the national value score from 2011 to 2020.

In contrast to the prior two decades, a health care delivery system value score declined over the last decade. The decline was associated with reductions in hospital and payer market competition and partly mitigated by expanding insurance coverage. Policymakers should test interventions to increase competition in markets for health insurance and for hospital care, along with widening insurance coverage.

Ind-1024 The COVID-19 Lockdown Led to Undiagnosed Cancer Cases, with Impacts Varying by Age, Sex, and Cancer Stage

PRESENTER: **Li-Lin Liang**, National Yang Ming Chiao Tung University
AUTHORS: I-Hua Chen, CHANG-XI KUNG

BackgroundPrevious research has shown that cancer care was disrupted during the COVID-19 pandemic. However, the specific impact of lockdown measures on cancer burden at presentation remains underexplored, particularly in Asia. Moreover, studies examining non-cancer outcomes during lockdowns have shown disproportionate negative effects on subgroups such as women. To address these gaps, this study evaluated the impact of Taiwan's major lockdown measures—specifically the combined school and workplace closures—on the number of newly diagnosed cancer cases and tumor size at diagnosis, with a focus on subgroup differences. ***Methods*** This population-based study used data from the Taiwan Cancer Registry, National Health Insurance Research Databases, and the Oxford COVID-19 Government Response Tracker. The intervention period was defined as weeks 20–34 of 2021. Outcomes included weekly cancer incidence per 100,000 population and average tumor size at diagnosis. A multiple-group interrupted time series analysis (ITSA) estimated changes in cancer incidence, using 2018 and 2019 as historical controls. A difference-in-differences (DID) approach assessed changes in tumor size, using weeks 1–19 of 2021 as the pre-intervention period and 2015–2018 as the comparison group. Subgroup analyses were stratified by age, sex, socioeconomic status, AJCC stage, and cancer type. ***Results*** From January 2018 to December 2021, a total of 334,240 cancer cases were reported. During the lockdown period (May–August 2021), cancer incidence dropped by 39.3% ($P<0.01$) among females, with the decline disproportionately concentrated among those under 65, with Stage 0 and I cancers, and in colorectal, lung, and breast cancer cases. Among males, a decrease in incidence was observed only for Stage 0 (-37.7%) and Stage II (-38.8%) cancers. Average tumor size increased by 14.8% ($P<0.01$) in females and 11.2% ($P<0.001$) in males, with the largest increase (27.6%, $P<0.001$) seen in females under 50. Tumor size increased for lung cancer in both sexes (11–13%, $P<0.05$), for colorectal cancer in females (18.1%, $P<0.01$), and for oral cancer in males (12.6%, $P<0.05$).
ConclusionsTaiwan's school and workplace closures were associated with a substantial reduction in cancer diagnoses among women, but not men, and with increased tumor size at diagnosis, particularly among younger women. The more pronounced decline in early-stage cancers suggests potential stage migration. Concurrent decreases in incidence and increases in tumor size for female colorectal and lung cancers indicate delayed diagnoses. Tumor growth in colorectal cancer may be partly attributable to the invasive nature of diagnostic procedures such as colonoscopy, which may have deterred patients during the pandemic. Tumor growth in lung cancer may reflect healthcare system strain due to overlapping demands from COVID-19 and respiratory care. These findings highlight missed opportunities for curative treatment and emphasize the need for targeted policies to address the uneven impact of lockdowns on cancer care, especially among vulnerable subgroups.

Ind-2734 Contributions of Hospitals of Different Sizes to The Efficiency And Sustainability of The SUS: an Integrated Analysis With DEA And Malmquist

PRESENTER: **Ivan Augusto Cecilio e Silva**
AUTHORS: Ivanessa Thaiane do Nascimento Cavalcanti, Luis Eduardo Maciel dos Santos Ferreira, MARIANA Marzullo M PEDREIRA, Ana Carolina Esteves da Silva Pereira, Harrison Floriano do Nascimento, Alessandra Gaspar Sousa, Gustavo Laine Araújo de Oliveira, Ms. Erika Aragao

Background: Hospital efficiency is an essential metric for analyzing universal health systems, such as the Unified Health System (SUS) in Brazil. Based on the literature, efficiency tends to be relatively higher in large hospitals, which typically have greater technological and operational capacity. However, the contribution of smaller hospitals, crucial for ensuring access and equity, is often undervalued in efficiency analyses. **Objective:** The aim of this study is to analyze the performance of the hospital network in Brazil between 2019 and 2023, focusing on the provision of services to SUS. The research examines service production, investments in equipment and human resources, and hospital size, comparing and ranking health units in terms of technical efficiency (TE). **Methodology:** Data Envelopment Analysis (DEA) and the Malmquist

Index were used to measure changes in total factor productivity over the period from 2019 to 2023. The DEA model evaluates comparative efficiency among hospitals, while the Malmquist Index distinguishes the effects of technological progress and TE on productivity. **Results:** The analysis included 2,745 general hospitals that provide services to SUS, categorized by size (small, medium, large, and special) based on the National Register of Health Establishments (CNES). The results revealed an unequal distribution of efficiency, with large hospitals showing 11% efficiency, in contrast to 8% for special hospitals, 7% for medium hospitals and 3% for small hospitals. The Malmquist Index indicated that small hospitals had made more significant technological progress, while the others had greater difficulty in keeping up with innovations. However, these findings suggest that efficiency should not be analyzed solely through the lens of technological capacity and service volume. Smaller hospitals, although less efficient in terms of absolute productivity, play a crucial role in local access, promoting equity, and responding quickly to community health needs, particularly in areas more remote from large centers. **Conclusion:** Statistical findings point to disparities in TE according to hospital size, reinforcing the importance of a balanced hospital network in Brazil, where hospitals of different sizes complement each other in ensuring universal health access. The findings suggest that investment policies that strengthen management and technology in smaller hospitals could improve the efficiency and accessibility of SUS as a whole. To achieve this, it is essential to disseminate good practices observed in larger hospitals and adapt them to the realities of smaller hospitals, maximizing system efficiency without compromising the essential role of local hospitals. Differentiated investment strategies, such as technological support for smaller units and incentives for specialization in larger hospitals, have the potential to strengthen the sustainability and quality of health services in Brazil, serving as a model for health systems facing similar challenges. **Keywords:** Unified Health System, Hospital Care, Technical Efficiency, Hospital Size, Universal Coverage.

Ind-2320 Public Health System and Variation in Private Health Insurance Coverage

PRESENTER: **Ivan Prenhaca**
AUTHORS: Carolina Marinho, Sergio Firpo

This paper measures the impact of expanding universal public health on private insurance coverage. We employ a difference-in-differences framework and exploit the rollout of the Family Health Program (PSF) in Brazil, a community-based intervention focused on improving access to primary care. We find that the program decreased private coverage, with a stronger decline in more developed municipalities. We estimate an average crowding-out effect of the program on private health of about 32%, a magnitude similar to what is found in the US. We also present evidence of lower costs to small and micro firms as the program increases their share in the economy substantially. Our results suggest savings of 3.7 billion USD due to higher per capita costs in the private sector.

8:30 AM –10:00 AM MONDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Executive Room 2

Determinants of Health and Labour Market Outcomes

MODERATOR: **Ann-Kathrin Fischer**,

Ind-401 Global Health and Related Economic Benefits of Urban Green Space

PRESENTER: **Tingting Ye**
AUTHORS: Ke Ju, Shanshan Li, Yuming Guo

Background While the health benefits of green space exposure are well documented, the economic benefits associated with reduced mortality have not been thoroughly quantified. This study estimates the global, regional, and national urban mortality burden preventable by long-term green space exposure, along with associated health-related economic benefits and spatiotemporal trends from 2000 to 2020. **Methods** Using high-resolution, validated data, we estimated preventable mortality linked to green space exposure across global urban areas from 2000 to 2020 at a 1 km × 1 km resolution. The normalized difference vegetation index (NDVI) served as a proxy for greenness. Age- and sex-specific population counts at the grid level were combined with country-level mortality rates from the Global Burden of Disease (GBD) database to analyze mortality by grid cell. Relative risks were derived from published meta-analyses of cohort studies that examined the causal relationship between NDVI and mortality. We adopted the value of statistical life (VSL) approach to estimate the country- and year- specific economic benefits from preventable mortalities All estimates were stratified by sex, age group, GBD regions, and World Bank income level groups. **Results** Long-term greenness exposure was associated with the prevention of approximately 1.17 million (95% CI: 0.70 – 1.67) all-cause deaths per year in urban areas from 2000 to 2020, equating to 9.24% (95% CI: 5.50 – 13.12) of total urban deaths or 89 (54 – 130) deaths per 100,000 population. Low- and middle-income countries (LMICs) accounted for over 76.9% of these preventable deaths, with the highest numbers in East Asia (0.29 million) and South Asia (0.22 million). Estimated economic benefits averaged $1,205 billion annually during 2000 – 2020, with the greatest benefits in China ($308 billion), the USA ($248 billion), Japan ($166 billion), the UK ($118 billion), and Germany ($106 billion). Globally, preventable deaths and associated economic benefits increased on average by 0.03 million deaths and $40 billion per year, respectively. In contrast, LMICs experienced an annual decrease in preventable deaths of 37 per 100,000 population. **Conclusion** Our findings highlight substantial global health and economic benefits of urban greenness, with the potential to avert significant mortality. These benefits underscore the need for policies to enhance green space accessibility, particularly in LMICs, to maximize health outcomes and promote environmental equity.

Ind-705 Accounting for Longevity: Assessing Cross-State Performance in India, 1981-2019

PRESENTER: **Pratyasha Acharya**
AUTHORS: Beverley Essue, Sumit Kane, Ajay Singh Mahal

Abstract

Background: India's real income per capita growth averaged 4.2% annually during 1981-2019, with considerable inter-state variation and no evidence of convergence. There were large interstate variations in health outcome gains over the same period, but policymaker focus has been on pure economic outcomes, neglecting the intrinsic value of health for social wellbeing. We incorporate longevity gains (to capture health gains) in a "full income measure" and assess cross-state gains in full income from 1981 to 2019, a period encompassing two key reform efforts: the 1980s and 1990s coincided with significant economic liberalization reforms; the 2000s were characterized by major health reforms, including investments in primary care and in publicly funded insurance.

Research Objectives: There were two main research questions: (1) Do Indian states exhibit convergence (or divergence) in growth in full income? (2) What are the implications for cross-state growth performance if the full-income measure were based on longevity gains among women, compared to if population-wide longevity gains were used?

Methodology: We followed Becker et al.'s (2005) approach that used the compensating variation method to measure the monetary value of longevity gains. State-level data on age-specific mortality rates from the Indian Bureau of the Census was used to construct survival functions using the Gompertz model. This was combined with income per capita data published by Reserve Bank of India to estimate the monetary value of improved survival from 1981 to 2019. Cross-state (real) per capita income changes were combined with monetary values of longevity gains to derive estimates of per-person growth in full income at the state level. Separately, the monetary value of survival gains among women was used to construct gender-adjusted rates of growth in full income. Cross-state and regional growth patterns in full income were assessed for convergence over time.

Key Results: Full income per person grew at an annual average rate of 5.8% compared to 4.4% for real income per capita during 1981-2019. The North region - which includes highly populous low-income states – experienced annual full income growth of 5.2%, while the relatively richer South and West regions grew at 6.3% and 6.5%, respectively, suggesting inter-regional divergence. Nonetheless, longevity gains contributed considerably more to full income growth (50.1%) than the Southern (38.8%) and Western (44%) regions. Moreover, the contribution of longevity to full income growth in poorer regions/states was especially marked during 1981 to 2001. Inter-regional full income performance based on the value of longevity gains among women is also divergent across states/regions, although disparities among states within regions narrowed. Nationally, the full income measure per person based on longevity gains among women was 7.4% more than when based on longevity gains among men, with the difference especially marked in the (poorer) North region.

Conclusion and Policy Implications: Trends in full income do not support the hypothesis of absolute convergence across Indian states. However, poorer regions have made significant strides in longevity gains among women and underline the instrumental role of accounting for health metrics in assessing economic growth patterns (and returns on health investments).

Ind-1306 Assessing the Effectiveness of Hospital Discharge Planning Synthesis of Empirical Evidence and Literature Findings

PRESENTER: **Lena Imhof**
AUTHORS: Jonas Schreyögg, Vera Winter, Robin Heber

Background/ research gap: Patient transitions between inpatient and outpatient settings represent a critical point in care, often associated with adverse events such as avoidable hospital readmissions or emergency department (ED) visits. Hospital discharge planning (DP) is a process designed to smooth the transition process and ensure continuity of care. Despite growing evidence on the effectiveness of DP practices, uncertainties remain regarding the specific interventions encompassed under the term "discharge planning". Furthermore, large-scale observational studies are limited and primarily focus on readmission rates, overlooking other meaningful patient and system-level outcomes. **Research question:** To address this gap, we conducted an umbrella review ("review of reviews") to categorize DP interventions and provide a comprehensive overview of studied outcomes, including their magnitude of effectiveness. We then used our literature findings to assess the effectiveness of DP on a variety of identified outcomes in a large-scale observational study. Our quantitative analysis particularly focuses on cardiovascular patients, a patient group often characterized by complex care needs and substantial healthcare utilization. **Methods:** For our umbrella review, we searched five databases. The methodological quality of each included review was determined using the AMSTAR 2 tool. DP interventions were summarized narratively and the strength of evidence was derived for all identified outcomes. In our quantitative analysis, we linked claims data from the largest German sickness fund with hospital quality data, which contain structural and quality-related metrics for all German hospitals. From this data, we derived hospital-level DP scores. We applied multilevel regression models with hospital random effects to assess associations between DP scores and outcomes such as readmission rates and length of stay. The models were adjusted for patient and hospital-level characteristics. **Results:** Our literature search yielded a total of 1,779 records of which n=34 reviews met our inclusion criteria. We identified 25 outcomes investigated by at least two reviews. Results indicate strong evidence that DP interventions reduce 180-day readmission and increase patient knowledge, moderate evidence for positively affecting quality of life and patient satisfaction, and low evidence for reducing mortality and ED-visits. Our data sample comprises 668,414 individual hospital cases between 2021 and 2024 with a cardiovascular diagnosis (ICD-10 I00-I99). Preliminary findings indicate a positive association between DP and several outcomes, but limited effects on other outcomes, such as mortality. Further subgroup analyses are planned to investigate whether the association between DP and outcomes differs across patient (e.g., disease type, case severity) and hospital (e.g., size, specialization) characteristics. The empirical findings align with the main results from our literature review. **Conclusion:** This study provides a comprehensive synthesis of the existing literature on hospital DP and presents new empirical evidence on the impact of DP on diverse patient outcomes. The findings offer valuable insights for researchers, policymakers, and professionals seeking to optimize care transitions and improve patient outcomes through strategic DP. The variability in effectiveness across outcomes highlights the need for tailored DP processes that align with patient and system priorities.

Ind-2778 The Causal Impact of Obesity on Labour Market Outcome: Evidence from Mendelian Randomisation Analyses Using UK Biobank Data.

PRESENTER: **Aharon Katz**

Obesity is one of the most pressing public health challenges of our time, with widespread implications for individual well-being, healthcare systems, and economic productivity. Its prevalence has risen dramatically in recent decades, accompanied by increasing evidence of its adverse impact on labour market outcomes such as employment probabilities, wages, and absenteeism. However, establishing a causal relationship between obesity and labour market performance is challenging due to confounding factors, reverse causality, and measurement biases. This study explores the causal impact of obesity on labour market outcomes using data from the UK Biobank, a comprehensive dataset combining genetic, health, and socioeconomic information. We apply a Mendelian randomisation (MR) approach, using a genetic risk score (GRS) for higher body mass index (BMI) as an instrumental variable. This method leverages genetic predispositions determined at conception, enabling us to isolate the exogenous variation in obesity while addressing key endogeneity concerns, such as omitted variable bias and reverse causation. To account for the heterogeneity in obesity's impact across diverse demographic and socioeconomic subgroups, we apply a combination of IV techniques and the person-centered treatment effect (PeT) framework. This methodological approach extends beyond traditional average treatment effect estimations, uncovering nuanced, subgroup-specific impacts that reflect the complex relationship between obesity and employment probabilities. Our findings consistently demonstrate a significant and negative causal effect of obesity on employment across all methods included. Furthermore, the marginal effect of obesity on employment probability varies notably by the approach applied and by sex, age, and socioeconomic status. These results highlight the broader economic burden of obesity, revealing its impact not only on healthcare costs but also on labour market performance and the deepening of economic inequalities. This research makes several key contributions. It enhances the methodological robustness of causal inference in the obesity-labour market literature by integrating genetic instruments and advanced econometric techniques. It also provides actionable insights for policymakers and public health stakeholders, emphasising the need for targeted interventions to mitigate the economic and social consequences of obesity. Policies promoting healthy weight management could have far-reaching effects, not only improving public health but also enhancing workforce productivity and reducing economic disparities. By drawing on the rich UK Biobank data and applying innovative analytical approaches, this study offers a comprehensive examination of the intersection between obesity and labour market outcomes, bridging gaps in existing research and contributing to a deeper understanding of the economic ramifications of obesity.

8:30 AM –10:00 AM MONDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Karangasem

Behavioral and Systemic Drivers of COVID-19 Vaccine Uptake and Healthcare Utilization

MODERATOR: **Laura Boonstoppel**,

Ind-1840 Medium-Term Effects of the Covid-19 Pandemic on Healthcare Utilisation in Europe: Changes in Behaviours or in Characteristics?

PRESENTER: **Florence Jusot**, Université Paris Dauphine

AUTHORS: Justine Bondoux, Louis Arnault

Background The COVID-19 pandemic has significantly altered health and healthcare use of many individuals, all over Europe. Healthcare rationing was severe during epidemic peaks, due to postponed treatments or elective surgeries and to a contraction of demand induced by fear of contamination. Recent literature has mainly studied this decline at both the demand and supply levels. It also has focused on individuals' determinants of unmet care needs and their short-term effect on health. However, the medium and long run impact of the COVID pandemic on health care utilisation has not been studied. **Research question and aim** This study explores the medium-term effects of the COVID-19 pandemic on healthcare utilisation of people aged 50 or more in Europe. It analyses whether unmet needs that occurred during the pandemic induced a subsequent increase in health care utilisation, or whether healthcare needs may still not have been met after the pandemic. We aim to identify the mechanisms behind these potential evolutions, by distinguishing between the role of changes in healthcare-seeking behaviours, and of shifts in individuals' needs and resources. This differentiation offers a new approach to documenting the mid-term consequences of COVID-19. **Data and Methods** We use a balanced panel of over 37,000 respondents from waves 8 and 9 of SHARE, aged 50 or over and living in private households across 28 countries. Oaxaca-Blinder decompositions are applied to various curative and preventive care variables to compare the determinants of healthcare utilisation before and after the pandemic. This method helps to disentangle how changes in characteristics (e.g., health needs, socio-economic variables, etc.) and behaviours (i.e., shifts in the effects of these characteristics) have contributed to differences in healthcare use. **Results** The findings indicate a decrease in the probability of doctor visits (both general practitioners and specialists) and preventive care utilisation (eye exams, mammograms, and colon cancer screenings), except for flu vaccinations. The reduced number of visits can be attributed to changes in healthcare-seeking behaviours induced by the pandemic, despite health deterioration that would typically lead to increased healthcare utilisation. Notably, older individuals are less likely to undergo screenings and medical consultations post-pandemic. Individuals with chronic conditions tend to have fewer doctor visits, women are less likely to have at least one contact with a specialist, and the influence of financial stability and income on eye exam utilisation has diminished. **Policy Implications** Understanding the extent to which healthcare utilisation has fallen short enables policymakers to adapt public policies to ensure that individuals receive care that aligns with their needs (to safeguard their health and that of their relatives) and is delivered at the right time (to prevent future healthcare costs). Additionally, analysing the mechanisms driving these changes can inform the development of tailored public policies, adapted to specific national contexts or target population groups, thereby promoting greater equity in healthcare utilisation.

Ind-2376 COVID-19 in Adults With Disabilities: Disparities in Health Care Utilization And Employment Outcomes

PRESENTER: **Prof. Zoe McLaren, Ph.D.**, University of Maryland Baltimore County
AUTHORS: Mir Usman Ali, Nancy Miller, Zach Starr

Objective

The Covid-19 pandemic has disproportionately impacted individuals with disabilities continuing long-standing inequities in access and use of health care. In the United States (U.S) adults with disabilities were more than twice as likely to have experienced Covid-19 and twice as likely to report a negative health impact from Covid-19 than those without disabilities. This disparate impact has been attributed to two key factors: a higher risk of poor health outcomes and decreased access to routine care. Post-Covid condition (i.e. long Covid) is defined as having one or more of a broad range of symptoms develop during or after Covid-19 and continue for at least 2 months and has been considered a disability in the U.S. since July 2021.

To assess the short- and longer-term health impacts of Covid-19 for adults with disabilities, we will use nationally representative data from the United States National Health Interview Survey (NHIS) to estimate the impact of post-Covid conditions on disability status, health care utilization and employment outcomes. We examine how these impacts are moderated by differences in disability status, race and household income.

Data and Methods

We will use nationally representative in-person interview data from repeated cross-sectional panel data in the NHIS of approximately 27,000 adults annually from 2019 through 2023. The data includes information on health (including sensory, physical and mental impairments, Covid infection and post-Covid condition) as well as sociodemographic groups, health insurance, health behaviors, health care utilization, and employment. Our analysis uses linear probability regressions of binary outcomes on our set of explanatory variables and a standard set of control variables.

Results

Individuals with post-Covid condition are a statistically significant 1 percentage point more likely to report having a disability, a statistically significant 7 percentage points more likely to report delaying accessing health care due to travel time and a statistically significant 6.4 percentage points more likely to report delaying accessing health care due to limited insurance coverage. They are no more likely to report being employed. Among individuals with post-Covid condition, greater household wealth is associated with a lower likelihood of being disabled or reporting barriers to health care. We find no evidence that race confers greater disadvantage to those with post-Covid condition in the areas of health care access or employment. However, underlying racial disparities in access to health care may hinder non-white populations from being diagnosed with post-Covid condition in the first place. Our results are robust to several measures of disability status.

Conclusions

Given that Covid-19 continues to circulate widely in the U.S., a large population is therefore at potential risk for post-Covid condition. Policy is urgently needed, not only in the U.S. but also around the world, to mitigate the negative short-term and long-term impacts of post-Covid condition and the associated impairments that limit access to health care.

Ind-349 The Effects of Individual Perceptions of COVID-19 on Vaccine Acceptance Among Korean Employees: Focusing on Work and Family

PRESENTER: **Na-Young Yoon**
AUTHORS: Juhyeon Moon, Dongkyu Lee, Soonman Kwon

[Introduction] During the COVID-19 pandemic, South Korea relied on extensive testing, contact tracing, and social distancing rather than lockdown. Although temporary work policies allowed flexible work arrangements, most Korean employees continued on-site work due to company policies. Each employee faced their own circumstances within their families, leading them to respond to the pandemic with different perceptions. These perceptions of COVID-19 could impact their acceptance of preventive health measures, particularly vaccination. COVID-19 vaccine acceptance was complex, considering both the government and individuals' insufficient information about potential side effects. Consequently, understanding employees' perceptions of COVID-19, considering their personal contexts, is important for explaining their vaccination behaviors. This study aims to analyze the impact of individual perceptions of COVID-19—including risk perception, and satisfaction with the government's COVID-19 response—on employees' vaccine acceptance.

[Methods] The data were obtained from the 2021-2022 Korea Labor and Income Panel Survey. The study focused on low-risk subjects aged 18 to 49 who could voluntarily choose to be vaccinated. A total of 2,009 respondents were analyzed, excluding those vaccinated before August 2021—when mass vaccination for the low-risk general population began—and unvaccinated for medical reasons. To identify factors influencing vaccine acceptance, survival analysis using Cox regression was conducted. The time from August 2021 until the completion of the first and second vaccine dose were calculated using survey data indicating the vaccination year and month. Covariates were grouped into four categories: 'Perception factors' (risk perception, satisfaction with the government's COVID-19 response)', 'Family environments' (household size, living with seniors aged 60+, presence of young children), 'Working conditions' (employment status, job classification, work schedule, experience of flexible work arrangement), and 'Socio-economic factors' (sex, age, education, residence, marital status, income, health status, risk preference, resilience).

[Results] Among the 2,009 respondents, 94.03% had received at least one dose of a COVID-19 vaccine, while 5.97% remained unvaccinated.

Risk perception of COVID-19 was significantly associated with earlier initiation of partial vaccination (first dose only) (HR=1.10, 95% CI: 1.03-1.17). In contrast, satisfaction with the government's COVID-19 response was significantly associated with earlier completion of full vaccination (both doses) (HR=1.04, 95% CI: 1.02-1.07).

When the interaction between individual perceptions and personal context was examined, only the effect of COVID-19 risk perception on vaccination timing varied across family environments, not across working conditions. In larger households—specifically those with four or more members—higher risk perception was significantly associated with earlier uptake of both partial and complete vaccinations (interaction term: Partial, HR=1.20, 95% CI: 1.02-1.41; Complete, HR=1.25, 95% CI: 1.05-1.48). Similarly, among individuals living with senior household members aged 60 or older, higher risk perception was also significantly associated with earlier uptake (interaction term: Partial, HR=1.25, 95% CI: 1.05–1.49; Complete, HR=1.20, 95% CI: 1.00–1.43). In contrast, satisfaction with the government's COVID-19 response did not exhibit any significant variation across either family contexts or working conditions.

[Conclusion] Our findings suggest that increased concerns about infecting family members are key factors in understanding how employees' individual perceptions affect their vaccine acceptance. In these circumstances, they may be more risk-sensitive, and decide to get vaccinated earlier due to perceived positive externalities for both themselves and their close contacts. To promote compliance with preventive health policies among employees, the government should design risk communication strategies that are more tailored to their family circumstances.

Ind-957 A Qualitative Inquiry on Drivers of COVID-19 Vaccine Hesitancy Among Adults in Kenya

PRESENTER: **Stacey Orangi**, Kemri-Wellcome Trust Research Programme
AUTHORS: Daniel Waweru Mbuthia, Evelyn Kabia, Elwyn Chondo, Carol Ngunu, John Ojal, Edwine Barasa

Background: COVID-19 vaccination rates have been low among adults in Kenya (36.7% as of late March 2023) with vaccine hesitancy posing a threat to the COVID-19 vaccination program. This study sought to examine facilitators and barriers to COVID-19 vaccinations in Kenya.

Methods: We conducted a qualitative cross-sectional study in two purposively selected counties in Kenya. We collected data through 8 focus group discussions with 80 community members and 8 in-depth interviews with health care managers and providers. The data was analyzed using a framework approach focusing on determinants of vaccine hesitancy and their influence on psychological constructs.

Results: Barriers to COVID-19 vaccine uptake were related to individual characteristics (males, younger age, perceived health status, belief in herbal medicine, and the lack of autonomy in decision making among women - especially in rural settings), contextual influences (lifting of bans, myths, medical mistrust, cultural and religious beliefs), and COVID-19 vaccine related factors (fear of unknown consequences, side-effects, lack of understanding on how vaccines work and rationale for boosters). However, community health volunteers, trusted leaders, mandates, financial and geographic access influenced COVID-19 vaccine uptake. These drivers of hesitancy mainly related to psychological constructs including confidence, complacency, and constraints.

Conclusion: Vaccine hesitancy in Kenya is driven by multiple interconnected factors. These factors are likely to inform evidence-based targeted strategies that are built on trust to address vaccine hesitancy. These strategies could include gender responsive immunization programs, appropriate messaging and consistent communication that target fear, safety concerns, misconceptions and information gaps in line with community concerns. There is need to ensure that the strategies are tested in the local setting and incorporate a multisectoral approach including community health volunteers, religious leaders and community leaders.

8:30 AM –10:00 AM MONDAY [Health Beyond The Health System]

Bali International Convention Centre – Magnolia

Air Quality and Health: Economic and Social Impacts of Pollution and Policy Interventions

MODERATOR: **Aparnaa Somanathan**,

Ind-447 Cardiovascular Health and Economic Outcomes Under Improved Air Quality in China: A Modelling Study

PRESENTER: **Siyuan Wang**
AUTHORS: Sarah Lewis, Mingsheng Chen, Lei Si, Gian Luca Di Tanna, Laura Downey, Yawen Jiang, Stephen Jan, Zhiwei Xu

Introduction: China faces the dual challenge of elevated air pollution and an increasing burden of cardiovascular disease (CVD). Estimates suggest that approximately 5.09 million CVD related deaths occurred in 2019, of which 1.42 million deaths were attributable to exposure to particulate matter (PM). Annual average PM2.5 concentrations in 49 cities were above 50 μg/m3 in 2020, surpassing national regulatory guidelines, and more than 10 times above the WHO suggested guidelines of 5 μg/m3. Few studies have projected the potential cardiovascular, quality of life and economic benefits of improved future air quality scenarios. To model these benefits associated with lowering PM2.5 concentrations and guide future national air policies, we estimated the healthcare cost savings associated with CVD and the quality-adjusted life years (QALY) gained under scenarios of improved air quality in China. **Methods:** A health prediction model was developed to estimate 10-year CVD-related costs and QALY associated with PM2.5 levels in 2015, as well as two hypothetical improved air quality scenarios: 1) the China national PM2.5 target of 35 μg/m³, and 2) the WHO's PM2.5 guideline of 5 μg/m³. 10-year age-and sex- specific integrated atherosclerotic cardiovascular disease (ASCVD) risks were estimated from the 2015 China Health and Retirement Longitudinal Study. Relative risks from

WHO's integrated response functions were subsequently applied to baseline cardiovascular risks to predict ten-year ischemic stroke and coronary heart disease (CHD) event probabilities for individuals aged 45 to 85 years under the three air quality scenarios. Further, probabilities were extrapolated to the national population, where we sourced baseline population data and survival probabilities from the UN population prospects database for all individuals between 45-85 years. Baseline survival probabilities were adjusted to account for improvements in air quality. On a yearly basis, we predicted national 10-year estimates of ischemic stroke and CHD incidences, total healthcare costs and accrued QALYs at a 5% discount rate for individuals aged 45 to 85 years under the modeled scenarios. **Results:** Under PM2.5 levels in 2015, we estimated a cumulative 10-year incidence of 35.40 million CVD events, resulting in healthcare costs of US$96.12 billion and 4.44 billion QALYs. Under the national target of 35 μg/m³, the projected 10-year CVD incidence was 31.92 million cases, resulting in cost savings of US$9.29 billion and 3.43 million QALY gains compared to 2015 levels. If PM2.5 concentration levels meet the WHO's guideline of 5 μg/m³, the projected number of CVD events would decrease to 24.18 million, translating to cost savings of approximately US$30.10 billion and gains of 11.29 million QALYs. **Conclusion:** Our findings show that achieving the WHO recommended PM2.5 concentration level of 5 μg/m³ could lead to over threefold greater health and economic benefits than those achievable under national standards of 35 μg/m³. This underscores the potential need for stricter future national PM2.5 standards. Our findings also inform other LMICs in establishing effective long-term PM2.5 targets.

Ind-451 Health and Economic Benefits Associated With the 14th Five-year Clean Air Action Plan in China: A Modeling Study

PRESENTER: **Siyuan Wang**
AUTHORS: Zhiwei Xu, Mingsheng Chen, Lei Si, Stephen Jan, Laura Downey, Gian Luca Di Tanna

Introduction: Air pollution poses a significant health and economic challenge in China. The national 14th Five-Year Action Plan has committed to reducing PM2.5 levels by an additional 10% by 2025, relative to 2020 levels and establishing a national target of 25 μg/m³ by 2030 for 337 prefecture-level cities. To assess the health and economic impacts of these policies, we modeled the attributable health and economic outcomes associated with achieving the latest national regulations from 2021 to 2030, as well as the additional benefits associated with reaching the more stringent WHO target of 5 μg/m³ over the same period. **Methods:** Using 2020 ground-level PM2.5 measurements as the baseline, we projected cause-specific mortality and morbidity outcomes for all 337 prefectural-level cities in China from 2020 to 2030 under two policy scenarios: 1) the 14th Five-Year Action Plan (i.e. a 10% PM2.5 reduction by 2025, with a target of 25 μg/m³ by 2030), and 2) the WHO target of 5 μg/m³ by 2030. Mortality estimates for non-communicable diseases (NCD), lower respiratory infection (LRI), stroke, ischemic heart disease (IHD), lung cancer (LC), and chronic obstructive pulmonary disease (COPD) were calculated using the Global Exposure Mortality Model. Hospitalizations were projected using log-linear models based on national epidemiological evidence from China. We applied the value of statistical life (VSL) method to estimate economic benefits from reduced mortality and the cost-of-illness (COI) method for benefits from reduced hospitalizations. Baseline demographic data from the 2020 census were projected according to the Shared Socioeconomic Pathways (SSPs). Cause-specific mortality rates were sourced from national death registries and projected annually, assuming continuous trends in risk factors. Cause-specific hospitalization rates and associated healthcare costs for cardiovascular and respiratory diseases were sourced from national statistical yearbooks and projected using joinpoint regression. **Results:** Under the SSP2 scenario ("middle of the road"), we estimated an average annual reduction of 166,314 (95% CI: 136,363 to 180,823) in PM2.5-attributable premature deaths across 337 cities. This included average annual reductions of 50,825 premature deaths from IHD, 59,240 from stroke, 14,517 from COPD, 4,683 from LRT, and 22,669 from LC. Annual average reductions in hospitalizations were estimated at 19,683 for cardiovascular diseases and 24,391 for respiratory diseases. Subsequently, economic benefits from reductions in mortality and morbidity across 337 cities amounted to US$23.8 billion annually over the policy period, including US$23.4 billion in mortality benefits using a VSL of US$230,421. Further, achieving the WHO's target of 5 μg/m³ is projected to result in an additional average reduction of 459,843 premature deaths annually, along with a decrease of 42,462 cardiovascular hospitalizations and 52,681 respiratory hospitalizations each year, corresponding to an additional annual economic benefit of US$65.18 billion. **Conclusion:** Our findings highlight the health and economic benefits of the clean air action plan across 337 cities in China and underscores the need for more ambitious air quality targets, given the additional benefits achievable at the 5 μg/m³ threshold.

Ind-1174 Beyond Diagnosis: The Hidden Health Burden of Long-term PM2.5 Exposure on Hypertension, Diabetes, and Kidney Disease Through Biomarkers

PRESENTER: **Akshar Saxena**, Nanyang Technological University
AUTHORS: Mingxuan Fan, Zhuoru Ma

Background: Long-term exposure to PM2.5 has been linked to elevated risks of various chronic diseases. However, existing studies primarily rely on self-reported ever-diagnosed data, overlooking the potential of biomarkers to assess the early health impacts of air pollution. This gap may lead to an underestimation of PM2.5's true health burden. Evidence suggests that PM2.5 induces systemic inflammation and oxidative stress, impairing vascular endothelial function, insulin sensitivity, glucose metabolism, and glomerular filtration, thereby altering biomarkers associated with early health risks. These biomarkers are not only predictive of early health damage but are also strongly correlated with risks of hypertension, diabetes and impaired kidney function. **Aim:** This study aims to investigate the causal relationship between long-term PM2.5 exposure and the risks of hypertension, diabetes, and kidney disease, with a focus on the sensitivity of biomarkers in detecting early health risks compared to traditional clinical diagnoses. This approach addresses gaps in existing research and provides new insights into the mechanisms of PM2.5-related health impacts. **Methods:** We conducted analyses using data from the China Health and Retirement Longitudinal Study (CHARLS), National Aeronautics and Space Administration (NASA), and the China City Statistical Yearbook. The study employs a three-year average PM2.5 exposure as the independent variable and applies a two-stage least squares (2SLS) approach to address endogeneity in causal identification. A key innovation lies in the construction of the wind direction variation instrument, which captures inter-city differences in air pollution driven by changes in wind patterns. This refined instrument significantly enhances the validity and precision of the instrumental variable. Robustness checks included using alternative exposure periods (2 and 1 years), a substitute instrumental variable (thermal inversion days), and a one-year lagged diagnosis analysis. **Results:** The 2SLS results show that each unit increase in PM2.5 exposure raises the risk of

hypertension, diabetes, and kidney disease by approximately 4.87%, 15.87%, and 9.26%, respectively, as detected through biomarkers. In contrast, PM2.5's impact on traditional self-reported diagnoses by clinician for these conditions was not significant. This discrepancy indicates that biomarkers are more sensitive in capturing early health impacts of PM2.5 exposure, while clinical diagnoses may underestimate the true health burden. Robustness checks confirmed these findings across different exposure periods and instrumental variables, and the lagged one-year diagnostic analysis further underscores the limitations of clinical diagnoses in detecting disease risks, while highlighting the superior capability of biomarkers in assessing early-stage health risks. **Conclusions:** This study demonstrates that long-term PM2.5 exposure significantly increases the risk of hypertension, diabetes, and kidney disease by affecting biomarkers. These findings deepen our understanding of air pollution's health effects and underscore the critical role of biomarkers in early disease detection. Policymakers should consider stricter air pollution control measures and incorporate biomarker-based assessments into public health monitoring systems to identify and intervene in high-risk populations sooner.

Ind-1317 Maternal and Child Health Impacts of Pollution: Evidence from a Quasi-Experiment, the Low Emission Zones in England.

PRESENTER: **Eleonora Fichera**
AUTHORS: Habtamu Beshir, Stephanie von Hinke

Background: This paper extends our [BLIND REF] research on the impact of air pollution on physical health and wellbeing to UK hospital records on maternal and child health outcomes. Conceptual frameworks from human and health capital theory by Becker and Grossman, and self-productivity and dynamic complementarities (Heckman) highlight the importance of focusing on this population group because of the long term-effects on later life outcomes. However, establishing the causal impact of pollution on health is hindered by location sorting and avoidance behaviour generating a spurious correlation. This article contributes to this gap using hospital records, a quasi-experimental design and accounting for confounders with mother fixed effects. *Objectives*: In this paper, we exploit a quasi-experiment with the introduction of Greater London's Low Emission Zone (LEZ) and Central London's Ultra-Low Emission Zone (ULEZ) to estimate the causal impact of pollution on maternal and child health outcomes. LEZ was launched in 2008 over most of Greater London. ULEZ, implemented in Central London since early 2019, imposes stricter emission standards such as: Euro 4 for petrol cars and vans; Euro 6 for diesel cars; Euro 6 for diesel vans; and Euro 6 for lorries, buses, and coaches. *Data and Methods*: We have used Freedom of Information requests on postcode level data from Transport for London (TfL) to identify the areas under LEZ ad ULEZ. Using this information and with the help of the NHS digital team, we have constructed individual level exposure/treatment to LEZ and ULEZ based on the patient's postcode in the Hospital Episode Statistics (HES) dataset. Our outcome measures are hospital records on mother and child health outcomes: infant prematurity (< 38 weeks), birthweight, stillbirths and gestational age, type of delivery, gestational hypertension. Moreover, we have used Lower Super Output Area socioeconomic data from the ONS and weather data from the Met Office - MIDAS Land Surface Stations to account for area level differences. We then use difference-in-differences, and event study analyses exploiting the time of introduction of LEZ and ULEZ and comparing exposed areas in Greater London and Central London to comparable unexposed areas in England. *Results*: We find that exposure to LEZ and ULEZ significantly improves maternal and child health outcomes. Specifically, LEZ and ULEZ policies lead to a reduction in stillbirths, increase in birthweight and reductions of C-section deliveries. This impact is stronger for those living in relatively more deprived areas. *Policy implications*: The negative impact of air quality on key measures of child health, given the literature on dynamic complementarities over the life cycle, suggests that clean air transport policy may also have positive impacts later in life.

Ind-1421 Air Quality and Suicide

PRESENTER: **Claudia Persico**
AUTHOR: Dave Marcotte

Suicide is among the world's leading causes of death, claiming the lives of more than 800,000 annually (WHO, 2014). Following a period of decline, suicide rates are on the rise in the United States. While much work has focused on the roles of economic conditions and substance abuse on suicide, exposure to pollutants has received almost no attention as a risk factor. Pollution has been shown to increase depressive symptoms, affect health more generally, and increase the likelihood risky behavior leading to misbehavior in school and criminal activity, yet we know little about the effects of pollution on self-harm. Nevertheless, there is evidence that pollution could affect suicidality through increasing inflammation in the body, leading to worse symptoms of depression.

In this paper, we conduct the first-ever large-scale study of pollution and suicide, relying on data for all deaths in the U.S. over eight years. We estimate the impacts of individual pollutants on suicides throughout the U.S. using daily data on suicide counts by state-county matched to daily air quality data from the Center for Disease Control (CDC), daily weather data from the National Oceanic and Atmospheric Administration (NOAA), daily pollution data from the Environmental Protection Agency and CDC, and demographic data between 2003-2010. Using a difference in differences design controlling for weather, population, holidays, day of the week, and county, state-month and month-year fixed effects, we first estimate whether days in the same month, year and county with elevated levels of pollution lead to atypical increases in suicide. We then use variation in wind direction as an instrument for pollution, to limit attenuation bias that results from measuring exposure to pollution within a county-day using fixed monitoring sites. We find that a 1 μg/m3 increase in daily Particulate Matter 2.5 (PM2.5), also known as fine particulate matter, is associated with a 0.49 percent increase in daily suicides (a 0.5 percent increase above the mean). In addition, we find that a 1 μg/m3 increase in PM2.5 is associated with a 0.3577 percent increase in all daily deaths, which is an increase of 0.4% above the mean. We also find that a 1 μg/m3 increase in monthly PM2.5 is associated with 0.171 more suicide-related hospitalizations (a 50.5% increase above the mean), as well as evidence that pollution affects self-reported mood more broadly. We also investigate the timing of exposure through event studies.

This work has important implications for suicide prevention. Our work could add insight into an additional mechanism for policy makers working to reduce suicide mortality. If we know that certain places are more likely to experience increases in suicides on certain days, policymakers and practitioners will be better able to target resources to those places. In addition, this work has implications for understanding

the full costs of airborne pollutants. If certain types of pollution increase the risk of suicide, then targeted regulatory efforts might decrease the suicide rate.

8:30 AM –10:00 AM MONDAY [Health Beyond The Health System]

Bali International Convention Centre – Jakarta A

Mental Health: Causes and Consequences

MODERATOR: **Andrew Briggs**,

Ind-295 Global Distribution and Economic Burden of Depressive Disorder: Equity and Socioeconomic Determinants in Middle- and Lower-Middle-Income Countries

PRESENTER: **Yan Xu**
AUTHORS: Shang Gao, Liangwen Ning, Xihe Yu

Background Depressive disorder is a leading global public health issue and a significant contributor to disability and reduced quality of life. The economic burden of depression, particularly in middle- and lower-middle-income countries, is compounded by social and economic determinants such as gender, education, income, employment, and poverty. These factors often exacerbate health disparities, leading to unequal access to mental health resources and services, which reinforces the cyclical relationship between poverty and poor mental health.

Methods

Data for this study were sourced from the 2019 Global Burden of Disease (GBD) study, encompassing depressive disorder incidence and burden data from 1990 to 2019 across 204 countries and territories. An age-period-cohort (APC) model was applied to assess trends in depressive disorder incidence across different SDI groups. This model captures the nuanced effects of age, period, and cohort, enabling detailed analysis of incidence trends and economic burden across all countries. Using the sociodemographic index (SDI), which includes per capita income, education, and fertility rate, countries were divided into five levels from high to low development. This study focused on middle- and lower-middle-income countries, and age-standardized incidence rates (ASIR) were applied to adjust for age distribution, offering clearer insights into depressive disorder trends across socioeconomic contexts.

Results From 1990 to 2019, the global incidence of depressive disorder saw a slight decline, with an age-standardized net drift of -0.24% (95% CI: -0.29, -0.18). Yet, trends varied significantly across SDI regions, revealing stark inequities in mental health outcomes. In high SDI regions, the incidence of depression rose notably among younger populations but decreased among the elderly, reflecting perhaps both high pressures among youth and effective support for older age groups. In contrast, middle and lower-middle SDI regions demonstrated a reverse trend, where the incidence declined in younger populations and increased in older cohorts. These findings suggest that social determinants, including limited access to education, low income, and inadequate employment opportunities, may play a significant role in shaping these trends in lower-income countries. Additionally, the APC model showed that lower-middle SDI countries had the largest decline in incidence, with a net drift of -0.46% (95% CI: -0.56, -0.37), while low SDI regions showed a notable but smaller reduction.

Conclusion The disparities in depressive disorder incidence and burden underscore the influence of social and economic factors on health outcomes, particularly in middle- and lower-middle-income countries. Economic strain, limited healthcare infrastructure, and restricted social safety nets intensify the burden of depression in these regions. High SDI regions benefit from more robust healthcare systems, though the rising incidence among younger individuals signals a need for mental health interventions that address the unique pressures faced by youth. In contrast, middle and lower-middle SDI countries require more substantial investment in social determinants of health—such as poverty reduction, education, and equitable healthcare access—to alleviate the disproportionate economic burden of depressive disorder. Policy actions should focus on enhancing mental health resources and addressing the socioeconomic barriers that drive disparities, ultimately fostering greater equity in mental health outcomes worldwide.

Ind-301 Mass Layoffs and Mental Health Care Use

PRESENTER: **Anam Bilgrami**, Macquarie University
AUTHORS: Rohan Best, Noura Saba, Yuanyuan Gu, My Tran, Dandan Yu, Marco Bertoni

Background: Approximately 44% of Australians aged 16–85 experience a mental disorder in their lifetime. Mental ill health imposes national economic costs of over $43 billion annually, and amongst developed countries, Australia ranks second on lost wellbeing attributable to mental ill health. Income is strongly interconnected with mental wellbeing. The most disadvantaged population quintile is two times as likely to have high psychological distress compared to the most advantaged. Past studies have also causally linked income ‘shocks’ to mental health. Compared with other chronic conditions, people with mental ill health are more likely to skip treatments, which may worsen psychological distress, and increase treatment costs from more severe future illness. Deferring health care is also more likely under financial stress. Recent data reveal that 70% of Australians under financial stress deferred seeing a doctor or getting prescriptions, with females and singles with children most likely to do so. Despite the implications of financial stress for mental health and health care use, there is no robust, causal evidence on whether Australians adjust mental health care use when facing income shocks, and whether income shocks contribute to disparities across population groups. This research will therefore explore whether and how Australians adjust their mental health care use in response to negative income ‘shocks’ created by ‘exogenous’ job displacement from mass layoffs, and whether impacts vary across population groups.
Research Aim: Our aim in this study is to look at the mental health care use impacts (medical services and pharmaceuticals) of job

displacements from mass layoffs in Australia over the period 2014-2016. **Methods:** We will estimate impacts using a difference-in-difference strategy to compare mental health care use outcomes in long-tenure Australian workers displaced by mass layoffs over 2014-2016 to those who were not displaced. We will draw a sample of workers from whole-of-Australia population data over 2011-2019 linked to administrative data on employment, firm-level data on mass layoff frequency and health care use data (medical and pharmaceutical). Heterogeneity analyses will explore whether impacts vary across different population groups, including those who received welfare payments to cushion income losses, males versus females, those in high versus low socioeconomic regions, regional remoteness and individuals with and without dependent children. **Results**: The estimations are currently ongoing, and all results and descriptive statistics are under strict confidentiality obligations. They will be finalised and vetted by the Data Integrating Authority and Australian Bureau of Statistics and released before the conference, ready for presentation. **Conclusions and expected policy implications:** The research has strong potential to improve living standards by informing policy on access to mental health care across Australian population groups by need, including potential barriers that need to be addressed. The research will generate policy suggestions on welfare and income support policies targeted to people experiencing job displacements, and ensuring adequate support and access to health care in the face of income shocks created.

Ind-1917 Working Longer, Feeling Worse? How Job Quality Shapes the Mental Health Toll of Delayed Retirement

PRESENTER: **Michele Belloni**
AUTHORS: Alexandra Lugova, Bérangère Legendre, Jérémy Tanguy

The ageing population in the EU is placing significant pressure on pension systems, prompting reforms aimed at extending working lives to reduce financial strain. However, these changes may have unintended consequences on the mental health of senior workers, particularly those in demanding jobs, leading to increased healthcare costs and reduced productivity. While previous research suggests a general decline in mental health following delayed retirement, few studies have examined how job characteristics influence these outcomes. This paper explores how different occupational characteristics modulate the mental health effects of pension reforms, highlighting the importance of considering working conditions when designing policies to extend working life. We focus on pension reforms that delayed the retirement age between 2011 and 2015 across 14 European countries, assessing their impact on late-career depression, which we measure with the Euro-D scale that shows the number of depression symptoms on a 12-point scale. Using individual demographic and health data from the Survey of Health, Ageing, and Retirement in Europe (SHARE), combined with occupation-level data on working conditions from the European Working Conditions Survey (EWCS), we employ a staggered difference-in-differences design to estimate the effects of these reforms. Specifically, we examine how changes in the work horizon (*i.e.* the number of years a worker must remain employed before becoming eligible for retirement) affect depression prevalence among senior workers, with a focus on how job characteristics - such as skills and discretion, working time quality, physical environment, social environment, job intensity, and career prospects - moderate these effects. We show that, overall, extending the work horizon worsens mental health among older workers. A 1-year increase in the work horizon leads to a 0.041 increase in depression symptoms, while reforms extending the work horizon by more than a year result in a 0.273 increase in depression symptoms, corresponding to 2% and 26% of the control group mean, respectively. However, this effect is not uniform across occupations. Workers in low-skilled, high-intensity, insecure jobs with poor career prospects and unsupportive social environments experience significantly worse outcomes – doubling and tripling the baseline estimates, depending on the job quality dimension. In contrast, we find reversed effects for workers in supportive, high-quality work environments with stable jobs offering good career prospects, who show strong improvements in mental health, with reductions in depression symptoms doubling the baseline estimates in amplitude. We ensure that these results are robust to different threats that may affect the identification of these causal relationships. These findings suggest that policies extending working lives should incorporate targeted support, such as gradual, partial, and flexible retirement schemes, for workers in precarious jobs, where mental health risks are higher. At the same time, interventions aimed at improving workplace social support and promoting lifelong learning may help mitigate the adverse effects of delayed retirement at the organizational level.

Ind-2006 Evaluating the Influence of Taxation and Social Security Policies on Psychological Distress: A Microsimulation Study

PRESENTER: **Daniel Kopasker**, University of Glasgow
AUTHORS: Rachel Thomson, Petra Meier, Srinivasa Vittal Katikireddi, Matteo Richiardi, Peter Craig, Clare Bambra, Patryk Bronka, Nik Lomax, Alison Heppenstall

Background

Economic determinants are important for population health. Tax and social security policies directly influence these economic determinants and could be harnessed to improve health outcomes and reduce inequalities, but actionable evidence of how policies can utilise these pathways remains scarce. Microsimulation is a promising method to support evidence-based policymaking when empirical evaluations are either unavailable or may take many years to emerge. This study employs an open-source microsimulation framework to evaluate the effects of taxation and social security policies on population mental health. The UK economic crisis caused by the COVID-19 pandemic provides an informative context involving an economic shock accompanied by one of the strongest discretionary fiscal responses amongst OECD countries.

Methods

The analytical setup involves a dynamic, stochastic, discrete-time microsimulation model (SimPaths) projecting changes in psychological distress given predicted economic outcomes from a static tax-benefit microsimulation model (UKMOD) based on different policy scenarios. We contrast projections of psychological distress for the UK working-age population from 2017 to 2025 given the observed policy environment against a counterfactual scenario where pre-crisis policies remained in place. Levels of psychological distress and potential cases of common

mental disorders (CMDs) were assessed with the 12-item General Health Questionnaire (GHQ-12). The main hypothesis tested is that the policy response limited increases in psychological distress and CMDs during the economic crisis by influencing economic determinants of mental health. Support for this hypothesis will provide initial evidence for the scale and nature of changes required for tax and social security policies to improve population mental health more generally. While the focus is on the UK, the analysis can inform the structure of policy responses to economic crises in other countries with well-developed tax and social security systems.

Results

The UK policy response to the economic crisis is estimated to have prevented a substantial fall (over 12 percentage points, %pt) in the employment rate in 2020 and 2021. In 2020, projected psychological distress increased substantially (CMD prevalence increase >10%pt) under both the observed and the counterfactual policy scenarios. Through economic pathways, the policy response is estimated to have prevented a further 3.4%pt [95%UI 2.8%pt, 4.0%pt] increase in the prevalence of CMDs, approximately 1.2 million cases. Beyond 2021, as employment levels rapidly recovered, psychological distress returned to the pre-pandemic trend. Sustained preventative effects on poverty are estimated, with projected levels 2.1%pt [95%UI 1.8%pt, 2.5%pt] lower in 2025 than in the absence of the observed policy response.

Conclusion

The study shows that policies protecting employment during an economic crisis are effective in preventing short-term mental health losses and have lasting effects on poverty levels. This preventative effect has substantial public health benefits. Microsimulation has the potential to overcome barriers that have limited the evidence base for governments to improve population health using a range of policy areas.

8:30 AM –10:00 AM MONDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Lotus

Evaluation of Parmaceutical Policies/Programs

MODERATOR: **Ana Balsa**,

Ind-172 Long-term Sustainability of National Essential Medicines Policy in Primary Care System in Rural China from 2012-2017

PRESENTER: **Xuechen Xiong**
AUTHORS: Zhaohua Huo, Li Luo, Jianchao Quan

Background: The implementation of National Essential Medicines Policy (NEMP) in China since 2009 was effective in curbing exploding drug prices and expenditures; however, evidence on its long-term sustainability is lacking, especially in rural and remote areas. This study evaluated the long-term impacts of NEMP on drug availability and affordability in a deprived rural county in southwestern China from 2012-2017. **Methods:** A quasi-experimental design with pre-post-comparison was used to analyse 108,111 purchase records on 475 medicine types, extracted from 7 township health centres (THCs) and 76 village clinics from 2012-2017. Pharmaceutical data were analysed quarterly. Availability of medicine was measured by the number of medicine types prescribed for patients; affordability was measured by the price index, based on the cost changes to obtain a fixed basket of medicines since 2012. For statistical analysis, interrupted time-series analyses were used to examine sustained trends of outcomes during the 1st-stage NEMP (2012-2015) and the immediate and sustained changes after the 2nd-stage NEMP (2016-2017). **Results:** Overall, the number of medicines in rural primary care kept increasing during the 1st-stage NEMP (+5.1 per quarter) but encountered significant and sustained drop after the 2nd stage NEMP. Drug price index has kept increasing during the 1st-stage NEMP as well as after 2nd-stage NEMP (+0.2% per quarter), while the overall medicine sales remained steady over the observation course of NEMP. By medicine types, availability of traditional Chinese medicines improved and surpassed that of western (chemical or biological) medicines. In contrast, rises in price of western medicines outstrip those of TCMs, especially after 2nd-stage NEMP. By facility levels, village clinics encountered continuous drops in both the availability and sales of western medicines, while facing the edging up prices. In THCs, drug prices and sales presented milder rises, especially in western medicine and after 2nd-stage NEMP. **Conclusions:** Availability of medicines improved in the longer run of NEMP in rural primary care, mainly attributed to TCMs. Nevertheless, challenges remained alongside the policy promotion, especially in the provision of western medicines under the uprising price trends. Village clinics as health gatekeepers are facing severer challenges in this context and require further attentions. **Keywords**: essential medicine; accessibility; affordability; price; rural; primary care

Ind-1088 Effectiveness of Strengthening Primary Care Management on Chronic Conditions Through Waiving Pharmaceutical Copayment: a Pilot in Rural China

PRESENTER: **Weijia Lu**
AUTHORS: Timothy Powell-Jackson, Anne Mills, Qianchen Wei, Hanyi Xu, Beibei Yuan, Ping He, Qingyue Meng, Jin Xu

Introduction

The underutilization of primary care (PC) presents a substantial challenge in enhancing the people-centeredness, quality, and efficiency of health services for patients with chronic diseases. User fees, particularly for medicines, have been considered a key barrier to patient access in low- and middle-income countries (LMICs). As pharmaceutical copayment constitutes the largest proportion of household health expenditure for NCDs in LMICs, reducing such copayment is a potential strategy to encourage PC use and improve health system performance regarding

NCDs.

However, there has been a lack of research exploring PC-targeted expansion of pharmaceutical benefits in China and other LMICs. To evaluate this potentially useful policy intervention, this study evaluated the effects on healthcare utilization and expenditures for patients of a pilot in rural China that waived copayment for essential pharmaceuticals at PC facilities (i.e. township health centers) only. The study also sought to explore whether free medication might reduce disease-related hospitalizations.

Methods

The impact of PC-targeted removal of pharmaceutical user fees on health service utilization and expenditures was analyzed through a synthetic difference-in-differences (SDID) approach using claims data from the New Cooperative Medical Scheme. Our sample included a total of 39790 patients with hypertension and/or diabetes, including 9115 patients from 11 townships in County L where the policy change was introduced, and 30675 patients from 86 townships from the other 9 counties in the same municipality. Considering that policy was managed at the level of the township and that the claims data were not decomposable to a level below year, we used township-year as the unit of analysis. Claims data for 2010-2017 were used, including 4 years prior to and the 3 years after the start of the policy change.

Results

The policy led to a significant increase of 0.69 in the number of PC visits per patient per year (95%CI: 0.46 to 0.91), equivalent to a rise of 44.1%. Annual spending per person on outpatients at PC facilities increased significantly due to the policy, by 58 yuan (95%CI: 36 to 80), equivalent to a rise of 40.5%. As for outpatient visits at hospitals, there was a 25.8% significant reduction in the number of visits per year (-0.56; 95%CI: -0.95 to -0.16) and a nonsignificant increase in spending (45 yuan; 95%CI: -111 to 21). The annual number of admissions and spending on inpatients per person in all facilities remained stable.

Conclusion

PC-oriented removal of outpatient pharmaceutical copayment, like other policies that increase PC benefits, incentivizes patients to seek outpatient care at the primary level rather than at higher-level institutions. However, without additional efforts to strengthen the quality of PC, waving pharmaceutical copayment alone may not be a sufficient effect in achieving improved health outcomes and therefore avoid expensive inpatient care, if patients obtain medication without receiving necessary medical assessments and treatment. A more synergistic approach that combines financial incentives with professional support for PC may be needed to achieve meaningful and sustainable PC strengthening and health improvement.

Ind-542 The Influence of Cost-Effectiveness and Other Factors on Pharmaceutical Benefits Advisory Committee (PBAC) Recommendations in Australia

PRESENTER: **Yingying Wang**
AUTHORS: Ms. Marie-Anne Boujaoude, Yi-shin Yang, Cate Bailey, Kim Dalziel, Nancy Devlin, Natalie Carvalho

Objectives: In Australia, the Pharmaceutical Benefits Advisory Committee (PBAC) advises the Minister for Health and Aged Care on the listing of medications on the Pharmaceutical Benefits Scheme (PBS). Although summaries of PBAC decisions are published, it is not always clear what role cost-effectiveness and other factors, including clinical evidence and equity considerations, have on decisions. This study aims to explore how cost-effectiveness, in the form of incremental cost-effectiveness ratio (ICER) and other factors, including clinical evidence and equity considerations, influence the PBAC's recommendations. **Methods:** We acquired all public summary documents (PSDs) spanning November 2019 to May 2024 from the PBAC website. The eligibility criteria included PSDs reporting cost-utility analysis (CUA) and where PBAC recommendations were based on CUA results. The extracted information included: intervention, PBAC recommendation, incremental cost-effectiveness ratio (ICER) ranges for the base case and sensitivity analysis, population characteristics, disease area, comparator, efficacy and safety claims, budget impact, uncertainties in clinical and economic evidence, equity considerations, price negotiations, and consumer comments. A binomial logistic regression model was developed to explore the association between PBAC recommendations as binary outcome (recommended, rejected) and the identified factors. **Results:** Of 767 PSDs spanning the relevant time period, a total of 263 eligible PSDs were included in the analysis. Outcomes included 122 recommendations, 132 rejections and 20 other outcomes. 46.4% of submissions were related to cancer and other neoplasms, and 23.6% included indications for paediatric use. The median base case ICER range midpoint was similar across outcomes: and was stated as $65,000/QALY, though the mean varied from a stated $148,420/QALY for rejected submissions to a stated $106,077/QALY for recommended submissions. The median budget impact (over six years) midpoint was stated as $87.5 million for recommended submissions and $150 million for rejected submissions. Preliminary logistic regression analysis revealed several factors influencing the likelihood of a positive outcome. Submissions from 2021 ($p = 0.014$) and 2022 ($p = 0.021$) were associated with lower odds of a positive outcome compared to 2019. Higher budget impact midpoint was negatively associated with a positive outcome ($p = 0.004$). Submissions with fair (cost-effective with price reduction) or good (cost-effective and robust) economic evidence significantly increased the likelihood of a positive outcome ($p = 0.002$ and 0.003, respectively), and a similar trend was observed for good clinical evidence ($p = 0.087$). The stated ICERs (both the range in the base case, and from sensitivity analysis) were not found to be significant predictors of PBAC outcomes to recommend or reject based on publicly reported data. **Conclusions:** Preliminary findings suggest that PBAC recommendations are based on a range of factors extending beyond stated publicly reported cost-effectiveness. We did not observe a statistically significant association between outcomes and claimed ICERs; rather, the overall quality of cost-effectiveness estimates matters. Further investigation will be conducted by including more factors in the logistic model to better understand the determinants of PBAC recommendations.

Ind-1438 Efficiency Analysis of the Ethiopian Pharmaceutical Supply Chain System

PRESENTER: **Samuel Abera Zewdie**
AUTHORS: Ermias Dessie, Tesfaye Mesele Mekonnen, Dominic Albert Nkhoma, Tewodros Tebekew Admasu

Pharmaceutical supply chain (PSC) management is the backbone of healthcare delivery as the availability of pharmaceuticals and other medical goods at the right time and in the right quantities is crucial for the proper management of patients. Hence, an efficient supply chain is essential for assuring access to medicines, medical supplies, and equipment and minimizing wastage, thus bringing positive health outcomes. The PSC system in Ethiopia faces numerous challenges that hinder access to drugs. These challenges include inadequate storage facilities, unreliable transportation infrastructure, and inefficient distribution networks. Additionally, stockouts, counterfeit drugs, and poor-quality control are significant issues. The study attempts to understand the levels and sources of inefficiencies in the Ethiopian pharmaceutical supply chain, examining the procurement, warehousing, distribution, and utilization stages. It primarily explores inefficiencies in different supply chain stages to identify possible cost-savings and efficiency improvements. The study used a mixed-method approach involving quantitative and qualitative data collection and analysis focusing on pricing, order fulfilment cycle time, wastage of medicine, and stock-out rate. The results showed strong performance in some key measures while revealing gaps that should be addressed. On average, framework agreements (FAs) appear to offer better value for money in procurement, although there was wide variation in their expensiveness relative to non-FA. Stronger contract negotiation and management capacity could likely improve FA outcomes, especially if coupled with a strong market-shaping system, price monitoring, and international benchmarking system. Comparatively, the study has shown that EPSS' purchasing prices are lower than Uganda's NMS but higher than Kenya's KEMSA, suggesting that there is still room for further improvements. The study found that levels of preventable pharmaceutical wastage at EPSS warehouses were relatively low, but some savings could be made. The main causes of the expiry of pharmaceutical products include weak data management systems, and poor planning and forecasting, with 84% of drugs expiring over 30 days after arriving at the facilities. The average stockout rate across regular drugs was 27% and it takes 11.3 days for a customer to access the pharmaceutical commodity once an order is made from EPSS. To reduce inefficiencies, the study recommends investment in IT infrastructure to strengthen the coverage of e-LMIS across the health system. This would improve and promote end-to-end visibility and accountability in the PSC, enable wider use of efficiency metrics, and better support for informed decision-making in the PSC. In addition, reviewing and strengthening the implementation of the stock transfer policy across health facilities without compromising the quality, and strengthening policy on the donation of medicines by enforcing minimum shelf-life rules to reduce wastage and adhere to existing standards.

Ind-2104 Consumer Concentration and Digital Technology Adoption in Pharmaceutical Innovation: Insights from US Medicare Part D

PRESENTER: **Chuanzi Yue**, University of Bristol

This study examines the impact of consumer concentration on the adoption of digital technology in pharmaceutical innovation, leveraging the introduction of Medicare Part D as a natural experiment. Announced in 2004, Medicare Part D provided publicly subsidized prescription drug insurance to U.S. citizens aged 65 and older who previously lacked coverage. The program led to a substantial reduction in drug prices, driven by concentrated negotiations conducted by Part D insurance providers on behalf of the newly insured senior population. Using a difference-in-differences design that leverages exogenous variation in drug spending exposure across diseases among this demographic, I analyze pharmaceutical trial data from ClinicalTrials.gov over the study period. Specifically, I compare the adoption of digital technology in trials targeting diseases with a high versus low spending share on prescription medications by Medicare Part D beneficiaries. The findings reveal that a 10% increase in exposure to Medicare Part D is associated with a 1.4% decline in the adoption rate of digital technology in pharmaceutical trials. Notably, this effect is concentrated among new trials initiated after the program's announcement, rather than those already underway. Furthermore, competition in the same disease area exacerbates this effect; each additional trial in a disease area prior to the announcement decreases the likelihood of digital technology adoption by 0.7%. In contrast, no significant reduction in adoption is observed in areas without competitive pressures. States implementing stricter biometric data laws experienced a more pronounced decrease in technology adoption following Medicare Part D exposure. These findings align with existing theoretical frameworks, emphasizing the trade-offs faced by forward-looking agents between the marginal benefits and costs of adopting new technology. The anticipated revenue from pharmaceutical innovations —dampened by consumer concentration through market competition—reduces the rate of adoption by lowering the perceived value of digital technology utilization. Furthermore, factors affecting the cost of adoption shape the elasticity of this response.

8:30 AM –10:00 AM MONDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Medan

Health and Care Workforce

MODERATOR: **Young Kyung Do**,

Ind-216 Occupational Mobility of Healthcare Workers over Business Cycles

PRESENTER: **Takuya Hasebe**, Sophia University
AUTHOR: Koyo Miyoshi

Abstract

Objectives: Securing a stable labor supply of healthcare workers is an important policy goal. Previous studies have found counter-cyclical patterns in health outcomes, with recent research suggesting that healthcare worker turnover contributes to these fluctuations. Therefore, understanding the occupational mobility of healthcare workers over business cycles is important. However, little is known about how and which types of healthcare workers response to changes in economic conditions. To fill this research gap, we examine the impacts of economic fluctuations on the likelihood a healthcare worker remains in their current occupation, switches to a different occupation, or stops working, and whether the impacts vary by the characteristics of a worker. Among healthcare occupations, this study focuses and compares on occupational

choices of registered nurses and nursing aides in the United States, with the former requiring more skills than the latter. Other healthcare occupations, such as physicians and pharmacists, are excluded due to either low occupational mobility or insufficient observations.

Methods: We use the basic monthly Current Population Survey (CPS) and its panel structure to estimate a multinomial logit model, with a monthly state-level unemployment rate as a key explanatory variable that proxies local economic conditions. We categorize occupational switches into two groups: health-related and non-health-related occupations. Thus, our logit model has four outcome categories: remaining in the current occupation, stopping work, switching to health-related occupations, and switching to non-health related occupations. Our sample covers the 20 years preceding the Covid-19 pandemic, from December 2000 to February 2020, ensuring sufficient sample sizes of the healthcare workers and ample variation in economic conditions. To investigate which types of workers are more responsive to changes in unemployment rates, we examine heterogenous impacts across educational attainment, wage distribution, and age.

Results: The procyclicality of the outflow in the healthcare workforce is observed only among skilled workers. When the unemployment rate is lower, registered nurses are more likely to switch to non-health-related occupations, especially those who are more educated, higher paid, and older. Conversely, less educated nurses are more likely to switch to other health-related occupations when the unemployment rate is lower. In contrast, nursing aides show little responsiveness to changes in unemployment rates, despite having a higher baseline occupational mobility than registered nurses.

Discussion: Our results suggest that the skill composition of the healthcare workforce likely fluctuates over business cycles. Given these fluctuations, healthcare quality is likely to be counter-cyclical, aligning with findings in the literature. However, this study does not yet uncover the mechanism by which the mobility of skilled healthcare workers responds to economic conditions. Understanding the mechanism is essential for designing policies that stabilize healthcare quality.

Ind-2258 Self-Sufficiency in the Healthcare Workforce: A System Dynamics Model of the Domestic and Foreign Educated Nursing and Midwifery Workforce in Ireland

PRESENTER: **John Cullinan**, NUI Galway
AUTHORS: Paul Caulfield, Peter O'Connor, Terence Hynes

ABSTRACT

Background

World Health Organisation (WHO) projections point to an increasing global demand for nurses and midwives, leading to shortages in many countries, particularly in less developed regions. Ireland, the context of this paper, currently relies heavily on foreign educated nurses and midwives to meet its demand, with Government policy now shifting towards a domestic recruitment model. This paper aims to identify the optimal nursing and midwifery annual recruitment requirement for supply to meet demand in the Irish health and care system in the long-term. It also seeks to highlight policy considerations for countries aiming to comply with the WHO Global Code of Practice on the International Recruitment of Health Personnel.

Methods

This paper develops and applies a system dynamics model of the domestic and foreign educated workforce supply by age and gender and is based on regulatory data on stocks and flows from the national professional regulator for nurses and midwives in Ireland. The model scope and design was informed by a problem statement developed in a series of workshops with officials of the Chief Nurses Office in Ireland. A range of reform scenarios and sensitivity analyses are also undertaken.

Results

The results confirm that Ireland is currently significantly undersupplying domestic nursing and midwifery graduates. The recruitment requirement in whole time equivalents (WTEs) in 2021 was 3,019, which would have required 3,495 graduates or 3,965 student places (4 years earlier) to meet this demand. This represents 152% of the 1,570 student places that were available in 2017 and suggests significant increases in nursing and midwifery student intake are urgently needed if Ireland is to reach self-sufficiency in a timely manner. The reform scenarios identify that by between 2034 and 2044, Ireland will need between 3,729-4,143 graduates in terms of WTEs a year. The sensitivity analysis suggests that the outer bound may be approximately 3% above or below the recruitment requirement by the end of the projection period. This would require between 4,895 and 5,439 students over the period 2030 and 2044.

Conclusions

The analysis suggests that Ireland requires a significant increase in nursing and midwifery student places to achieve self-sufficiency and that this will take time to achieve. Moreover, in addition to a sufficient domestic supply of nurses and midwives, self-sufficiency will also depend on managing demand volatility. Finally, countries anticipating an older society in the future should ensure they have sufficient health and care student places in place before the demographic transition.

Ind-1063 Assessing Allied Health Professional Preferences for Rural Workforce Training: A Discrete Choice Experiment

PRESENTER: **Rachel Milte**, Flinders University
AUTHORS: Jenny Cleland, Diana Khanna, Chris Brebner, Ali Dymmott, Stacey George

Background: People living in rural and remote areas experience higher rates of death, injuries, disease and hospitalisation than those living in metropolitan areas. Rural and remote Australians have significantly reduced access to health professionals who can support them to manage their health, including Allied Health Professionals (AHP). The search for workforce strategies to improve recruitment and retention of health professionals to rural and remote areas where they are needed continues. The Allied Health Rural Generalist Pathway (AHRGP) has been developed as a potential strategy to address workforce maldistribution. The program allows AHP to undertake formal education in rural generalist practice alongside dedicated supervision, quarantined study time at work and work-integrated learning opportunities. However, the importance of different components of the program to increase uptake among AHP and their managers has not been extensively investigated to date.

Methods: This study used a Discrete Choice Experiment (DCE) to evaluate participant preferences for an AHRGP via an online survey. In the DCE, the participants were presented with a series of hypothetical choices between two hypothetical AHRGP program options across six key attributes.** The six attributes provided variation in the level of costs covered, flexibility of the formal study program, recognition of training, expected increase in earnings, and broader professional development available. The DCE was provided to both AHP currently working in their disciplines, as well as Managers of AHP to understand any differences in preferences for design of the AHRGP between these two groups. Analysis was undertaken using Stata using a range of models including the conditional logit (as a widely-used model for analysis of such data) and mixed logit (to account for heterogeneity in preferences between individuals)

Results: 85 participants completed the Discrete Choice Experiment (DCE) survey. Participants significantly favoured options with flexible study options (0.49, $p<0.001$), and recognition of prior experience (0.37, $p=0.002$). Additionally, participants preferred formal recognition with a qualification at the completion of the program as compared to continuing professional development points (0.38, $p=0.001$). When comparing responses from AHP themselves vs their managers, managers showed a significant aversion to no cost coverage for the program (-1.66, $p<0.036$), but this was not significant for the AHP themselves. A greater range of attributes were statistically significant determinants of choice for the AHP compared to the managers, including the recognition of prior education in the program, and provision of a formal qualification upon program completion. Offering broader professional development online to staff of the practice more broadly was not a significant determinant of preferences.

Conclusions: This study provides for the first time preferences via a DCE approach for the design of workforce support programs to improve recruitment and retention of AHP to rural and remote areas. Overall, participants prioritised options that provided financial support, flexibility in the formal study program, formal recognition via a qualification for participation in the program, and recognition of prior learning towards their qualification. This study provides crucial information for the Australian government as they re-design supports offered for AHP working in rural and remote areas.

Ind-1455 Junior Doctors' Preferences for Clinical Practice in South Korea: A Discrete Choice Experiment

PRESENTER: **Young Kyung Do**
AUTHORS: Eunhye Hyun, Moo Hyuk Lee

Geographic and sectoral imbalances in physician distribution have long been a policy challenge not only in low- and middle-income countries but also in high-income countries. While these imbalances are observed at the aggregate level, they ultimately reflect individual physicians' preferences for clinical practice. This issue became particularly prominent in South Korea in February 2024, when the government announced a 65% increase in medical school admissions to address shortages in underserved areas and in certain "essential" specialties, such as emergency medicine. In protest of this policy, most junior physicians have walked off their jobs, resulting in severe disruptions to the healthcare system that continue to this day.

While theoretical and empirical research suggests that salary, leisure, location, and disutility from inducement are key factors affecting physicians' utility, preferences for clinical practice may vary substantially across healthcare systems, both in terms of the relative importance of these factors and the presence of other context-specific influences. This study investigates junior doctors' stated preferences for clinical practice in South Korea amidst the ongoing healthcare crisis. Using a discrete choice experiment (DCE), we aim to assess whether, and to what extent, non-pecuniary factors influence junior doctors' preferences for clinical practice.

To design the DCE, we conducted qualitative interviews with junior doctors using a semi-structured questionnaire informed by a review of relevant literature. Six key attributes were identified: salary, location, legal liability and lawsuit risk, pressure for hospital revenue, workload, and professional job satisfaction. These attributes, each with specified levels, were combined in an efficient design, allowing participants to repeatedly choose between two hypothetical healthcare institutions. The DCE survey was conducted in August 2024 and involved a total of 324 trainee doctors and specialists, proportionally allocated by region. A conditional logit model was used to estimate willingness-to-accept (WTA) values, quantifying the relative importance of each attribute level and the trade-offs between them. We also conducted subgroup analyses to explore potential heterogeneity based on respondents' characteristics, including hometown, medical school location, and residency training region.

Our results indicated that the six attributes were consistent with the predicted directions. The WTA estimates showed that junior doctors would require an additional $10,546 per month to practice in a non-SCA province, $20,339 to offset 'high' legal liability and lawsuit risk, $3,477 for 'high' pressure to generate hospital revenue, and $4,262 for a 'high' workload. Conversely, they were willing to accept a $4,112 monthly salary reduction for 'high' professional job satisfaction. Subgroup analysis also revealed that doctors from non-SCA provinces would require less compensation for working in such areas, compared to those from the SCA.

These findings underscore the significant role of non-pecuniary factors, such as legal liability and professional job satisfaction, in shaping junior doctors' preferences for clinical practice in South Korea. Current policy efforts to direct more junior doctors into rural provinces and "essential" specialties should take these factors into account. This includes addressing physicians' legal liability concerns at the national,

community, and institutional levels, as well as ensuring professional job satisfaction in both “essential” specialties and rural areas.

Ind-189 Estimating the Cost of Attracting Medical Graduates to Primary Health Care Positions in China: A Discrete Choice Experiment

PRESENTER: **Dan Wang**
AUTHORS: Hongbin Wu, Yu Yang

Background:

The development of primary health care is crucial for achieving universal health coverage. However, positions in primary health care, especially in rural areas, are often not the first choice for medical students. Enhancing the attractiveness of these positions to secure high-quality talent is of great significance.

Objective:

To understand the trade-offs and considerations in medical students' employment choices, calculate the cost of attracting them to primary health care settings, particularly in rural areas, and analyze the correlation between attraction cost and students' performance.

Methodology:

A discrete choice experiment was conducted as part of the 2024 China Medical Student Survey (CMSS). The study involved 11,618 final-year clinical medicine students. The experiment explored students' preferences and willingness to pay (WTP) for job characteristics including hospital level, cash incentives, career development support, years of service, and staffing status. Using a specific regression analysis method, we calculated the WTP for each job characteristic in terms of annual salary. By combining these findings with the actual employment destinations of medical students, we estimated the cost required to attract students with different employment preferences. Furthermore, we analyzed the correlation between the cost of attraction and students' performance.

Results:

All selected job attributes significantly influenced medical students' career choices. Students exhibited a high willingness to pay for staffing status (WTP = 44,820 RMB). Under equivalent conditions, township health centers need to offer an additional annual salary of 38,840 RMB to be as attractive as urban primary health service centers; an additional 35,030 RMB to match the attractiveness of secondary hospitals; and an additional 63,420 RMB to be as attractive as tertiary hospitals. Compared to students from urban areas, students from rural areas had higher preferences for cash incentives, transfer support, and staffing status. For these students, township health centers can offer relatively lower salaries to achieve the same attractiveness as urban hospitals. The cost of attracting medical students to primary health care positions, especially in rural areas, was positively correlated with their performance.

Conclusions and Implications:

Understanding medical students' preferences and willingness to pay for job characteristics can help policymakers design more effective incentives to attract high-quality medical graduates to primary health care positions, particularly in rural areas. The comprehensive application of these methods can positively impact the increase of human resources in primary health care, thereby promoting its development and contributing to universal health coverage.

Ind-2740 Motivating Social Workers for Smoking Cessation: A Discrete Choice Experiment in Urban China

PRESENTER: **Fengyi Sun**
AUTHORS: Zhan Zhao, Can Wang, Jixuan Wang, Jialong Tan, Jian Wang

Background Motivating social workers supporting smoking cessation is critical to enhancing the effectiveness of interventions aimed at reducing smoking prevalence and preventing relapse. Social workers, many of whom are volunteers, are instrumental in providing social support to disadvantaged groups, who often exhibit higher smoking rates and face significant barriers to quitting. Their role extends beyond traditional healthcare interventions, as they act as vital links between communities and public health initiatives. Despite their importance, China currently lacks sufficient grassroots smoking cessation programs and robust mechanisms to support social workers in this field. Existing programs are often fragmented, underfunded, and fail to provide the necessary incentives to sustain social worker engagement. This gap hinders the potential impact of community-based interventions and underscores the urgent need for strategies to effectively incentivize and empower social workers supporting smoking cessation. - **Objectives and Methods** This study aims to identify the key motivational factors influencing the participation of smoking cessation social workers in volunteer activities. A discrete choice experiment (DCE) was conducted among 227 smoking cessation social workers in District F of City B, China. Participants ranged in age from 18 to 68 years and represented diverse backgrounds, including students, healthcare physicians, retirees, and others. Using a validated smoking cessation knowledge questionnaire, we assessed their knowledge of smoking cessation, attitudes toward social work activities, and perceived self-efficacy. During the experiment, each social worker completed nine choice tasks, selecting between two hypothetical activities characterized by differing incentive structures, including monetary and non-monetary incentives, activity requirements, and location flexibility. These attributes were determined through literature research and expert interviews. Data were analyzed using mixed logit model and latent class model to understand preferences and heterogeneity among participants. - **Results** The mixed logit (MXL) analysis revealed that non-monetary incentives, such as *honorary recognition* and *opportunities for personal development*, were the most valued motivational factors. These incentives were as attractive as providing a transportation subsidy of approximately RMB 30 (USD 4.2) per activity. Conversely, mandatory participation requirements, such as minimum quotas for persuading smokers, significantly reduced willingness to engage. Activities held at flexible locations, including outdoor settings, were particularly appealing. Surprisingly, financial bonuses did not have a statistically significant effect on participation. Furthermore,

the latent class model (LCM) indicated that social workers with positive attitudes toward smoking cessation and higher self-efficacy preferred activities emphasizing recognition and skill development opportunities. - **Conclusions** The findings highlight the importance of leveraging non-monetary incentives, such as recognition and learning opportunities, to attract and retain social workers from the urban communities. These strategies align with the intrinsic motivations of social workers and foster a sustainable approach to strengthening smoking cessation interventions. Policymakers should prioritize designing programs that not only enhance social workers' skills and sense of accomplishment but also address structural barriers to their participation. By addressing these motivational needs, this approach provides a practical pathway for reducing smoking rates and improving public health outcomes in China.

Ind-1792 Preferences of Public Sector Doctors, Nurses and Rehabilitation Therapists for Multiple Job Holding Regulation: a Discrete Choice Experiment.

PRESENTER: **Busisiwe Matiwane**, University of the Witwatersrand
AUTHORS: Duane Blaauw, Laetitia Rispel

Background: Multiple job holding (MJH), or dual practice, of health professionals can impact healthcare both positively and negatively. This has resulted in a range of regulatory approaches in different countries, from having no restrictions to an outright ban. In South Africa, MJH is legally permissible, albeit with clear stipulations. The effectiveness of MJH regulation depends on the behavioural responses of different groups of health professionals but little is known about their preferences and likely reactions. **Aim:** Investigate the preferences of public sector doctors, nurses, and rehabilitation therapists in two South African provinces for different MJH regulations. **Methods:** We developed a novel discrete choice experiment (DCE) to evaluate the preferences of health professionals for jobs with varying MJH policy interventions. The DCE attributes included *restrictive* regulations (banning MJH) versus *reward-oriented* policies (increased public sector salaries, expanded overtime, well-resourced clinical practice environment, and better management). We produced an unlabelled DCE using an efficient design and administered it to doctors, nurses and rehabilitation therapists in public sector hospitals in two South African provinces. Each participant completed nine choice tasks, selecting between two hypothetical public sector jobs, offering different combinations of MJH incentives and restrictions. Generalized multinomial logit (G-MNL) models were used for analysis. Preference heterogeneity between professional groups and by MJH status were tested in interaction models. **Results:** Overall, 1387 participants from 29 public sector hospitals across two provinces completed the DCE in 2022, comprising 484 doctors (34.9%), 565 nurses (40.7%), and 338 rehabilitation therapists (24.4%). Doctors, nurses, and rehabilitation therapists were strongly opposed to banning MJH, requiring salary increases of 45.7%, 20.0%, and 42.8%, respectively, to accept a ban. Increased public sector salaries significantly improved retention. Non-financial incentives were also influential, with doctors, nurses, and rehabilitation therapists willing to forgo 57.9%, 54.8%, and 38.9% of their salaries, respectively, for an improved clinical practice environment. Competent hospital management was slightly less important. The DCE suggests that a ban on MJH could be offset by increased salaries or a well-resourced clinical environment, though overtime or better hospital management would need to be combined with other incentives. Some preference heterogeneity was confirmed; nurses had significantly different preferences compared to doctors and rehabilitation therapists, being less interested in part-time work and overtime and instead prioritising salary increases and the clinical practice environment. Health professionals engaged in MJH were more opposed to a ban and placed less importance on salary increases and the clinical environment compared to their non-MJH counterparts. **Conclusions:** The study confirms the preferences of three health professional groups for MJH regulatory interventions and the role of non-financial factors in MJH decision-making. Improving public sector working conditions and hospital management could boost retention, even if MJH is restricted. Such information is useful in the design and tailoring of MJH regulation, particularly in low- and middle-income countries (LMICs). The findings can guide the revision of MJH legislation in South Africa and inform MJH regulation design in other LMICs.

Ind-2769 How Does Heat Impact Healthcare Workers Performance and Quality of Care in Labour and Delivery Units? A Cross-Country Study Using Time-Motion

PRESENTER: **Nasser Fardousi**
AUTHORS: Elizabeth Dangaiso, Thabani Muronzie, Shobna Sawry, Veronique Filipi, Nondumiso Mbatha, Isabelle Lange, Giorgia Gon, Mbalenhle Mvundla, Bongani Mutimutema

Background:

Healthcare workers (HCWs) experiencing elevated temperatures in healthcare settings often suffer from thirst, excessive sweating, and fatigue, which can impair their focus. In resource-limited settings, healthcare is often underprepared for extreme heat events. Assessing the performance of HCWs under heat stress is crucial for improving service delivery and enhancing healthcare systems' resilience to climate change. This study aims to evaluate the effects of heat on midwives' performance and quality of care in labour wards in two hospitals in Zimbabwe and South Africa.

Method:

In both countries, we collected data on HCWs' performance during hot and cold seasons. We developed a specialised time-motion data collection tool to capture tasks performed by midwives and the time required to complete them during labour and childbirth. Data collection occurred in labour wards in Mt Darwin Hospital in Zimbabwe between Oct-2023 and Jul-2024, while data from South Africa were collected between Feb-2024 and Sep-2024 in Mamelodi Hospital.

To investigate the quality of care, we used guidance from the World Health Organisation on the quality of maternal care to define our indicators. More specifically, we measured performance indicators covering the provision of evidence-based practices(e.g. occurrence of skin-to-skin, rate of completion of essential practices), practices to promote a positive care experience (explaining the procedure, taking the mother's permission, the proportion of time a pregnant woman was left alone during labour), and service efficiency (break's length and frequency). The two-meter air temperature data derived from the ECMWF Reanalysis data (ERA-5) were used for our exposure variable. We will estimate the effect of heat

using mixed-effect models, clustering sessions by midwives' IDs while accounting for workload, staffing levels, and complications.

Results

We collected data from 249 sessions in Zimbabwe and 241 sessions in SA. The median session length in the Zimbabwean hospital was 33.52 minutes [IQR 23.32-49.20] and 52.53 [IQR 31.54-95.22] in SA. Most sessions were observed in the morning shift (194 (80.50%) in SA; 128 (51.41%) in Zimbabwe), with no sessions observed at night in SA. Delivery complications were observed in approximately a quarter of the sessions in each country. The analysis is underway, and results will be presented at the conference.

Conclusion

This study represents a first-time example of using of the time-motion method to assess the impact of heat on HCW service delivery and quality of care during childbirth. The findings will guide adaptation interventions at the facility level and larger initiatives aimed at enhancing health system climate resilience in Zimbabwe, South Africa, and other regions.

8:30 AM –10:00 AM MONDAY [Health Beyond The Health System]

os106 Bali International Convention Centre – Denpasar A

Outcomes of and Impediments to Substance Abuse Treatment

MODERATOR: **Joe Spearing**, University of York

CONVENER: **Partha Deb**, Hunter College

DISCUSSANT: **Dan Han**, National University of Singapore; **Anirban Basu**, The CHOICE Institute, University of Washington, Seattle

abs-os661 Effect of Cost-Sharing On Buprenorphine Prescription Dispensing: Evidence From a Regression Discontinuity Analysis

PRESENTER: **Thuy Nguyen**

AUTHORS: Kao-Ping Chua, Amy Bohnert, Rena Conti, Ushapoorna Nuliyalu

Increasing access to buprenorphine could slow the U.S. opioid epidemic. Whether cost-sharing impedes buprenorphine dispensing is unclear, as prior studies on this topic have used cross-sectional designs.

We analyzed the 2021-2022 IQVIA Formulary Impact Analyzer, which reports pharmacy transactions for 63% of prescriptions from U.S. pharmacies. The database includes claims (transaction records) for prescriptions regardless of whether they are filled by patients. Analyses included claims for immediate-release buprenorphine among commercially insured and Medicare patients within 60 days of January 1, 2022. Using a regression discontinuity design, we estimated the effect of cost-sharing per 30-day supply on abandonment by comparing discontinuities in cost-sharing and abandonment on January 1, 2022, exploiting the fact that deductibles typically reset at the beginning of the year. We used nonparametric local polynomial estimations to evaluate abrupt changes in cost-sharing and abandonment on January 1, 2022.

Analyses included 674,249 and 362,748 claims among commercially insured and Medicare patients, respectively. On January 1, 2022, mean cost-sharing increased by $13.4 (95% CI: $12.2, $14.5) and $7.0 (95% CI: $6.0, $7.9), respectively, but abandonment did not change (commercial: -0.1 percentage points, 95% CI: -0.3, 0.1; Medicare: 0.2 percentage points, 95% CI: -0.02, 0.5). Estimates suggest a $10 increase in cost-sharing per 30-day supply of buprenorphine would be associated with no change in the probability of abandonment among commercially insured patients (-0.1 percentage points, 95% CI: -0.2, 0.1) and with a 0.3 (95% CI: 0.02, 0.6) percentage-point increase in the probability of abandonment among Medicare patients. To explore potential variation in the effect of cost-sharing on prescription abandonment, we repeated analyses among the following subgroups: (1) prescription claims for patients in demographic subgroups defined by sex, age group, and Census region of residence; (2) prescription claims for patients who did or did not have a dispensed prescription for buprenorphine in the 180 days prior to the claim date; and (3) prescription claims for each of the 5 types of buprenorphine products. Among claims for commercially insured and Medicare patients, the estimate for the two-stage least squares analysis was significant only for 1 and 3 subgroup analyses, respectively. Point estimates in the subgroup analyses were small, ranging from -1.3 percentage points to 0.6 percentage points.

The findings of this regression discontinuity analysis suggest that cost-sharing may not be an important factor in whether privately insured and Medicare patients decide to fill buprenorphine prescriptions. Thus, any efforts to decrease buprenorphine cost-sharing should be coupled with interventions that address other, more important barriers to buprenorphine use.

abs-os660 Racial and Ethnic Disparities in Substance Use Disorder Treatment and Harm Reduction Services: Findings From the VOICES Survey

PRESENTER: **Jason Brian Gibbons**

AUTHORS: Sachini Bandara, Benjamin Lê Cook, Brendan Saloner

Objective: Quantify racial and ethnic disparities in harm reduction and SUD treatment use among people who use drugs and compare estimates using a disparities measurement method aligned with the Institute of Medicine (IOM) definition of disparities against other regression approaches.

Study Setting & Design: 45-minute telephone survey of people who use drugs administered from January 2023-August 2024 across four US States (i.e., Milwaukee County, Wisconsin; Flint/Detroit, Michigan; statewide in New Jersey; and Bernalillo County, New Mexico). Service use disparities were estimated using propensity score models with rank-replace methods and compared against logistic regression models.

Data Sources & Analytic Sample: Survey response data from 1,651 respondents who identified as White non-Hispanic (N=572), Black non-Hispanic (N=479), Hispanic (N=453), or American Indian/Alaska Native (N=147) and had used drugs in the past 30 days. Exposures included respondent demographics, health status, social determinants of health, and race/ethnicity. Outcomes included use of any harm reduction services, fentanyl test strip use, naloxone possession, any substance use disorder (SUD) treatment use, and receipt of buprenorphine, methadone, or naloxone in the past 30-days.

Principal Findings: Compared to White non-Hispanic (NH) respondents, Black NH respondents were 15.5 to 19.8 percentage points less likely to use harm reduction services and 7.6 to 9.2 points less likely to use SUD treatment. They also had significantly lower naloxone possession rates (19.8 to 21.7 points) and fentanyl test strip use (12.4 to 13.7 points). Hispanic respondents were 5.6 to 5.0 points less likely to use fentanyl test strips and had a 12.4 to 11.7 point lower likelihood of any SUD treatment. Disparities were also found among American Indian/Alaska Native respondents, particularly in SUD treatment (8.5 to 10.0 points).

Conclusion: Racial and ethnic disparities in harm reduction and treatment necessitate policy reform. Social determinants adjustment should be performed carefully to prevent underestimating health inequities.

abs-os659 Sociodemographic Profile and Rehabilitation Experiences of Drug Treatment Patients in LMIC: Findings From Facility and Patient Surveys

PRESENTER: **Firman Witoelar**
AUTHORS: Lisa Cameron, Jenny Williams

To address the growing challenge of substance abuse, in 2015, the Indonesian government launched a large scale, publicly funded, drug rehabilitation program that provides treatment to dependent drug users. In 2019, the National Narcotics Agency (Badan Narkotika Nasional, BNN), the main provider of the rehabilitation programs, operated more than 50 inpatient and outpatient rehabilitation centres around the country.

The study leverages the administrative information from BNN's administrative system by combining it with (1) longitudinal survey data on individuals who have undergone drug treatment at BNN facilities, who were surveyed during and after their treatment, and (2) survey information from the outpatient and inpatient drug rehabilitation programs offered at each facility, to gain insights into the rehabilitation process and rehabilitation experiences of the patients in the program. To complement these surveys, we also conducted facility and patient surveys in 5 community-based rehabilitation centres which offer different treatment programs than BNN facilities.

While basic information about the patients' demographic profile, assessment of addiction severity, and patterns of drug use are available from BNN's administrative data base, no detailed information are available on the patients' experiences in the program.

In the facility survey, we visited 12 largest BNN facility to collect information on the characteristics of treatment provided at each facility, as well as the training and qualifications and other characteristics of staff providing treatment. In the patient survey, we randomly selected patients who were undergoing rehabilitation in the 12 facilities and interview them for the first time during the rehabilitation and again a few months after they completed the treatment. We use the survey to look at individuals' economic lives and contextual information before and after treatment, external supports received during the treatment, the nature of their entry into drug treatment, and what they think about their rehabilitation experience.

By combining the findings from the patient survey, which in terms of sociodemographic characteristics broadly representative of the patients listed in the BNN administrative data base, with the facility survey, we are able to account for differences in treatment regime across locations as well as within locations and across inpatient and outpatient care. In turn, this help increase our understanding of the aspects of treatment that are associated with better post-treatment outcomes and experiences.

8:30 AM –10:00 AM MONDAY [Health Care Financing & Expenditures]

os146 Bali International Convention Centre – Frangipani

Unpacking the Drivers of Health of Expenditure Across Countries: What Contributes to Price and Volume Growth?

MODERATOR: **Jose Figueroa**, Harvard T.H. Chan School of Public Health

CONVENER: **Irene Papanicolas**, Brown University School of Public Health

DISCUSSANT: **Melinda Buntin**, Johns Hopkins University, Carey Business School

abs-os292 Assessing Drivers of Health Care Spending Growth for 50 US States, 2010-2019

PRESENTER: **Joseph Dieleman**, University of Washington
AUTHORS: John W Scott, Sawyer Crosby, Maitreyi Sahu, Haley Kathryn Lescinsky, Meera Beauchamp, Max Weil, Drew DeJarnatt, Azalea Thomson, Kayla Taylor

Background: While US health care spending is more than any other country in per capita terms and is growing, there is substantial variation in spending and growth rates across the 50 US states. The state of Utah spends close to a third as much per person as the state of Alaska, while between 1991 and 2020 Florida had personal health spending increase by 336% and Vermont grew 548%. In this study we focus on this within-country, cross-state variation in health spending growth and assess drivers of different growth rates.

Methods: Data for four key drivers of spending per capita – (i) population age, (ii) disease prevalence, (iii) service utilization, and (iv) price and intensity of care – were extracted for t0 US states, 148 health conditions, 38 age-sex groups, four payers, and seven types of care for 2010-2019 from the University of Washington's Disease Expenditure Project. Service utilization was measured as service volume per prevalent case, while price and intensity was measured as spending per visit, admission, or prescription. We used demographic decomposition methods (ie Das Gupta decomposition) to estimate the contribution of each factor to per capita spending growth. We used linear regression to assess what policies and health system characteristics were associated with spending growth caused by increases in utilization and price and intensity.

Results: Our initial estimates show that across all types of care and all states, population aging and increases in price and intensity of care contributed to additional health care spending. When aggregating across all 148 health conditions, changes in disease prevalence had a marginal impact on spending growth as decreases in disease prevalence of key cardiovascular diseases overpowered the impact of increases in diseases prevalence for key diseases such as type 2 diabetes in most states. Increases in outpatient visits per prevalent case led to increases in health care spending on ambulatory care in most states. These increases in utilization, plus increases in price and intensity of ambulatory care led ambulatory care to contribute the most to increases in health spending in all states. Hospital inpatient admissions per prevalent case deceased in most states, as care was substituted away from inpatient care, but the increases in the price and intensity of hospital inpatient care more than made up for those declines in spending. Finally, Medicaid expansion was associated with more service utilization in ambulatory care, while hospital market and insurance market concentrations were associated with larger increases in price and intensity of care.

Conclusions: Across all 50 states, increases in price and intensity of care was the primary driver in increases of spending, across most types of care. For ambulatory care, service utilization also contributed to increases in spending rates. Key factors associated with increases in price and intensity of care were hospital market concentration, insurance market concentration, hospital bed density, and the supply of health services. Understanding the drivers of spending variation in the US can help policymakers reduce or at least maintain US health care spending in the future. **

abs-os213 Decomposing Health Expenditure Growth into Price and Volume across Countries

PRESENTER: **Luca Lorenzoni**
AUTHORS: Jon Cylus, Irene Papanicolas

Aims: To explore the approaches currently used to deflate health spending for international comparisons and examine the feasibility and implications of using alternative health price deflators which can be constructed from available international expenditure data.

Methods: We identified five countries that produce national price deflators specific to health care: Australia, Canada, France, the Netherlands, and the U.S., and obtained time series of health price indices from the respective national agencies in each of these countries for the years 2000-2020. Secondary data on health expenditure were extracted from international and national agencies spanning the years 2000-2020. International price indices specific for health were constructed using available international expenditure data and compared to existing health specific national and general international price indices.

Key Results: We find meaningful variation across countries in the rate at which health prices grow relative to general prices. The U.S. had the highest cumulative health price growth compared to general price growth over the years 2000-2020 at 14%, followed by Canada and the Netherlands. Unlike the other study countries, health prices in France grew consistently in line with general prices. Price growth for health care paid for by public funds and households grew at different rates across countries, where price growth was higher for public payers. U.S. households faced the greatest mean annual price growth. For all countries, the use of a general price index suggests greater volume growth, and a lower contribution of price growth, to overall health expenditures as compared to the health specific deflators. The results obtained using the health-specific consumption-based deflator are more closely in line with the results obtained using the national health-specific deflators, except in the case of France where the results were similar across all price indices.

Conclusions: The choice of price index has major implications for comparative analysis. Despite their widespread use internationally, general price indices likely underestimate the contribution of price growth to overall health expenditure growth. We find that in addition to its reputation for having high health price levels compared to other high-income countries, the U.S. also faces health price growth for goods and services paid for by government and households in excess of general price growth. Furthermore, U.S. households are exposed to greater health price growth than households in comparator countries.

Ind-2728 Healthcare Labor Trends and Health Care Spending Growth in OECD Countries

PRESENTER: **Melinda Buntin**
AUTHORS: Jonathan Staloff, Ms. Bianca Frogner

Background/Aims: A marked slowdown in the rate of growth of health care spending as a share of gross domestic product (GDP) has been observed in the US and in Organization for Economic Cooperation and Development (OECD) countries over the past 15-20 years except for a brief surge during the first peak of the pandemic. This slowdown has been noted across different demographic groups, payer types, and types of care. While other studies have focused on demand side factors contributing to health spending trends, this study investigates how supply factors relate to these trends. Specifically, we examine the extent to which growth in healthcare labor explains health spending growth slowdown across countries.

Methods: We used the 2023 OECD Health Statistics to extract total healthcare spending and total healthcare employment between 2000 and 2022 for the US, Australia, Canada, and the UK. We examined health spending trends as a share of GDP and per capita as well as total healthcare employment as a share of total employment and per capita. We compared regression models fitted separately on health spending and labor trends. We also examined correlations between health spending and labor trends. We examined trends including and excluding significant changes in health spending and labor in 2020 due to the pandemic.

Key Results: Preliminary findings show a high correlation (R2>90%) between health spending and healthcare employment across all countries except the UK where the correlation was 80.2%. Healthcare employment increased across all countries as a percent of total employment and per capita at the beginning and end of the study period were similar across countries. Healthcare employment ranged from about 10.0% to 10.5% of GDP (or 46 to 52 workers per 1,000 pop) in 2000 to 12.5% to 13.5% (or 61 to 64 workers per 1,000 pop) in 2022. Each country had a significant change in slope in the late 2000s. These trends were apparent when expressed both as a percent or as per capita. In general, we find that, putting aside the pandemic period, labor growth rate in the US, Australia, Canada and the UK were similar.

Conclusions/Implications: Healthcare labor growth is slowing across countries and healthcare spending across countries is strongly related to the growth of healthcare labor. Being a service industry heavily reliant on labor, healthcare competes with other industries for labor, particularly low wage workers, that may constrain growth in labor and hence healthcare spending. In the US, higher health spending compared to other countries does not appear to be driven by more labor but rather higher wages. Recognizing this constraint is important for policymakers as countries project the trajectory of healthcare spending in the future.

8:30 AM –10:00 AM MONDAY [Supply And Regulation Of Health Services And Products]

os213 Bali International Convention Centre – Jasmine

Economic Incentives And Primary Care Physician Service Delivery

CONVENER: **Geir Godager**, Institute of Health and Society, University of Oslo

DISCUSSANT: **Yana Zykova**, Cluster for Health Service Research, Norwegian Institute of Public Health; **Fan Yang**, Center for Care research, Norwegian University of Science and Technology, Gj vik

abs-os555 Career Duration in General Practice: Results From a Complete Nationwide Panel of General Practitioners in Norway (2002-2021)

PRESENTER: **Mr. Geir Godager**, Universitetet i Oslo
AUTHORS: Yvind Snilsberg, Johannes Bjørnstad Tyrihjell

Abstract **Background:** General practitioner (GP) resignations have been suspected to contribute to the capacity challenges that are facing Norway's GP scheme. Understanding trends in exit rates and identifying any systematic changes over time are critical for informing health policy and addressing capacity issues. **Aim:** This study aims to describe trends in age-specific exit rates for GPs and examine whether there are systematic changes in these rates over time. By analyzing a comprehensive nationwide panel spanning two decades, we seek to clarify whether the observed increase in GP exits reflects fundamental changes in GPs' exit behavior or simply demographic shifts. **Data and Methods:** This registry-based observational study covers all GPs practicing in Norway since the scheme's implementation in 2001, using data from the FLO register maintained by the Directorate of Health. The dataset includes quarterly observations from 2001 to 2023, encompassing 8,943 physicians with municipal contracts, of whom 4,238 ended their careers as GPs. Our data enable us to distinguish between exiting the profession from relocating the practice or taking temporary leave. To classify as an *exit*, a GP must discontinue all GP contracts and remain inactive for more than eight consecutive quarters. Overall and annual exit rates were calculated, stratified by GP age. To identify exit rates significantly differing from expected levels, Clopper-Pearson confidence intervals (CIs) were constructed, and Bonferroni correction was applied to account for multiple hypothesis testing. Survival curves were also used to visualize exit rates over time. **Key Results:** Our analysis revealed that exit rates decline as GPs approach 50 years of age and remain consistently low until around age 67, when they increase markedly as GPs near typical retirement age. This structure is reflected in annual exit rates, which have remained stable over time, contradicting claims of recent surges in GP exits. Only two cases of unexpected exit rates were found: for 41-year-olds in 2010 and for 67-year-olds in 2007. Overall, the number of observed GP exits closely aligns with expected counts based on historical data from 2002 to 2021. **Conclusions and Implications:** The findings suggest that age-specific exit rates have remained stable over the two-decade study period, implying that increases in exit rates are not a significant factor contributing to recent capacity challenges in Norway's GP scheme. Consequently, recruitment and retention strategies should focus on other aspects of the GP workforce dynamic. The study underscores the importance of using historical exit rates to make accurate predictions for future GP exits, thereby better informing policy and planning. Given the stability of exit rates,

policymakers can reliably use historical data to forecast future GP workforce needs and implement proactive measures to sustain healthcare capacity. Future research should explore physician exit propensity in other parts of the healthcare sector to validate the findings' generalizability.

abs-os576 Continuity and Switching in Primary Care

PRESENTER: **Mr. Tor Iversen**, Universitetet i Oslo
AUTHORS: Øyvind Snilsberg, Anne Karen Jenum, Yuting Zhang

This paper examines how continuity and discontinuity in patient-GP relationships relate to the provision of guideline-recommended healthcare services, focusing on patients with type 2 diabetes (T2D) in Norway. Using nationwide registry data from 2018 to 2023, we analyse how relationship duration and switching to a higher-performing GP are associated with the provision of recommended services. Consistent with previous research, we find that longer relationships with the same GP are associated with higher provision rates, with progressively stronger associations beyond 10 years. We also find that switching to a higher-performing GP is linked to an increased likelihood of receiving recommended care. By comparing estimates from the two analyses, we show that, in some cases, switching to a high-performing GP may be associated with greater improvements than extended continuity. These findings highlight the importance of both long-term GP-patient relationships and GP-level differences in the delivery of care. While policy efforts often emphasize continuity, our findings suggest that switching can also be beneficial when it involves a move to a higher-performing GP, indicating policies supporting informed switching as a way to improve care.

abs-os563 Hypothetical Bias in Patient-Regarding Preferences: Comparing Fully Incentivized and Conventional Stated Preference Experiments

PRESENTER: **Ms. Fan Yang**, Norwegian University of Science and Technology
AUTHORS: Arne Risa Hole, Ge Ge, Jian Wang, Mr. Geir Godager

Abstract:

Background: Preference elicitation studies applying stated preference data have faced criticism for the potential presence of hypothetical bias, a discrepancy between hypothetical valuations and actual, or “true” valuations. While various studies have sought to mitigate hypothetical bias, the origins and mechanisms remain poorly understood. This study examines hypothetical bias within the context of experiments used to elicit patient-regarding preferences.

Aim: The primary aim of this research is to test for the presence of hypothetical bias in patient-regarding preferences. Specifically, we investigate whether hypothetical bias exists in physicians' evaluations of the benefits of medical treatments for their patients and the consumption opportunities available to their patients.

Data and Methods: We conducted two different laboratory experiments to elicit medical students’ patient-regarding preferences both with- and without financial incentives. By replicating incentivized laboratory experiments in a non-incentivized setting, we isolated the impact of hypothetical bias. Data were collected from a sample of medical students, who participated in either fully incentivized economic experiment with real monetary incentives for each attribute, or a conventional Discrete Choice Experiment with hypothetical framing. We fitted scaled multinomial logit models to quantify the preference- and scale parameters in both the incentivized and hypothetical arms of the study.

Key Results: The results indicate that, as anticipated, the relative valuation of real money was higher than that of hypothetical money; participants consistently showed greater generosity in the hypothetical setting than in the incentivized choice experiment. However, we found that the relative valuation of patient benefit and patient consumption by medical students remained unaffected by whether data was collected in a purely hypothetical setting or a fully incentivized choice experiment. Surprisingly, there was no statistically significant difference in the scale parameter between the arms, meaning that the participants in in the two arms did not differ significantly in their *degree of randomness in behavior.* This finding suggests that participants in the hypothetically framed experiment conducted their tasks with as much careful diligence as those in the fully incentivized experiment.

Conclusions and Implications: The findings of this study have substantial implications for health economics research and health policy. The absence of hypothetical bias in the relative valuation of patient benefit and patient consumption introduces an interesting nuance to previous findings. Our results align with the hypothesis proposed by Johansson-Stenman et al that behaviors indicative of desirable personality traits, such as generosity and moral identity, become more pronounced in hypothetical scenarios where real financial costs are absent. Future research should extend these findings to other parts of the health care sector to validate the generalizability of these results. Preregistration of future experiments on hypothetical bias could enhance the scientific impact of these findings.

abs-os547 Impact of Remuneration Scheme on General Practitioners' Antibiotic Prescribing Practices for Respiratory Tract Infections

PRESENTER: **Ms. Yana Zykova**

** **Abstract:** While careful use of antibiotics is crucial to reduce growth in antibiotic resistance, there is widespread prescribing of antibiotics even when their effect is minimal or nonexistent. This is especially relevant for respiratory tract infections (RTIs) in primary care. Antibiotic prescriptions might be valued by patients and perceived as an indicator of quality. We hypothesize that, compared to a fixed salary, the GP remuneration scheme based on the number of provided services (fee-for-service (FFS)) and the number of registered patients (capitation (CAP)) may motivate GPs to prescribe antibiotics for RTIs more often because it allows keeping patients on the list, attracting new patients, and saving time by avoiding discussions and finding alternative solutions with the patient. To our knowledge, there is only one study about the effect of the GP remuneration scheme on antibiotic prescription behaviour. Hutchinson and Foley (1999) found that in 1996 in Newfoundland,

Canada, GPs paid by FFS, compared to their salaried counterparts, prescribed more antibiotics per unique patient receiving antibiotic treatment than their salaried colleagues. However, the study design could not account for the frequency of infections among patients and cases when a GP abstained from antibiotic treatment. In our paper, we study a link between the GP remuneration type and the likelihood of antibiotic prescription during patient contacts with RTI. We compare FFS and a mix of FFS and CAP with a fixed salary. We also study whether GPs choose broad- or narrow-spectrum antibiotics when providing antibiotic treatment. Broad-spectrum antibiotics increase the chance of treating an infection from the first attempt (which patients may consider a quality of care mark) but contribute much more to the development of antibiotic resistance since they kill a wider range of bacteria species. We use data on all antibiotic prescriptions in Norway made by GPs in the period 2015-2019 combined with data on patient contacts with the GPs for RTIs and other relevant information about patients and GPs from several nationwide registers. The analysis of regular GPs allows for comparing GPs paid by fixed salary and a mix of FFS and CAP, while the analysis of locum GPs allows for the study of the difference between fixed salary and FFS. We use a linear probability model and show that the results are robust using logit and probit models. We find that the probability of antibiotic prescription for RTI for GPs remunerated by FFS and CAP was, in relative terms, 13-15% higher than for salaried GPs. When antibiotics are prescribed, GPs paid by FFS and CAP had an 10-11% higher probability of prescribing a broader-spectrum antibiotic. The findings are consistent when analysing within-subject effects on the subset of GPs switching remuneration types. We did not find any significant difference between FFS and fixed salary. Our findings suggest that it is important to provide GPs with incentives to follow guidelines for antibiotic prescriptions, especially when the share of contracts based on CAP and FFS is high.

8:30 AM –10:00 AM MONDAY [Health Care Financing & Expenditures]

os219 Bali International Convention Centre – Surabaya

Evolution of Health Expenditure Tracking in Africa: Institutionalisation and Applied Methodological Advances

MODERATOR: **Gabriela Flores**, World Health Organization

CONVENER: **Sophie Faye**, WHO

DISCUSSANT: **Brendan Kwesiga**, UNICEF; **Manjiri Bhawalkar**, The World Bank/GFF

abs-os594 Expenditures Tracking for Sexual and Reproductive Health Care and Rights in the African Region: Insights from the System for Health Account 2011.

PRESENTER: **Sophie Faye**, Abt Associates
AUTHORS: Sabine Musange Furere, Hapsa Toure, Maria Aranguren, Ogochukwu Chukwujekwu, Ke Xu

Background: Sexual and Reproductive Health care and Rights (SRHR) is integral to realizing Universal Health Coverage (UHC) and is enshrined in the Sustainable Development Goals (SDGs).

Universal access to SRHR is particularly important in Africa where the population is dominated by the youth. Significant progress has been made in the continent towards the realization of SRHR. In the last 30 years voluntary use of modern methods of contraception has increased by nearly three times. Maternal mortality has declined by over 60% and a significantly higher number of young people are able to access age-appropriate comprehensive sexuality education. Despite progress, the promise of health for all remains to be fulfilled for millions in the region. One in five women's need for family planning remains unmet. Maternal mortality remains unacceptably high. Gender-based violence and the prevalence of other harmful practices is widespread. At the current pace of progress, SDG target 3.7 on ensuring universal access to SRHR will not be met by the region.

One of the major concerns to accelerating progress towards universal SRHR, is the lack of adequate and sustainable financing for health in general and SRHR in particular. The volume and flows of financial resources for health, including SRHR, in a country is assessed through Health Account (HA). This is mainly done using the System for Health account (SHA) 2011 framework which, can help capture expenditures related to the essential components of SRHR identified in the Guttmacher-Lancet Report's (GLR)1 .

Research Aim: This research uses the SHA framework to accurately measure how much currently goes into financing SRHR to be able to make the case for mobilizing more money, but also using the current funds more efficiently.

Methods: This research reviews the SHA 2011 classifications to identify where spending related to the nine essential components of SRHR identified in the GLR is captured, and highlights any missing elements. This will then guide the proposal of a *Measure of Current SRHR spending* using the existing SHA 2011 classification and suggest specific codes to more accurately classify SRHR expenditures.

Preliminary results: The results highlight the lack of disaggregation in the spending, especially for maternal conditions and the absence of information on counselling and education expenditures. The proposed measure of current spending on SRHR, aggregating different SHA 2011 codes identified as representing aspects of the nine interventions in the GLR, highlights important variations in the African region.

Conclusions and Implications: Estimates and findings from this study are relevant for policymakers, researchers, and organizations involved in advancing SRHR as they can be used for evidence-based advocacy and increased resource mobilization.

abs-os601 Health Accounts and National AIDS Spending Assessments: Optimizing Alignment and Divergence

PRESENTER: **Deepak Mattur**
AUTHORS: Hapsa Toure, Maria Aranguren, Ogochukwu Chukwujekwu, Ms. Teresa Guthrie, Sophie Faye, Ke Xu

Background: Over 60 countries have produced fully disease-disaggregated health spending data using the System of Health Accounts (SHA), and more than 70 have undertaken National AIDS Spending Assessments (NASA). While both frameworks contribute valuable data, they are often conducted independently, raising questions about potential opportunities for synergies and efficiencies. SHA provides a systemic perspective of health spending within the national economy, while NASA focuses on spending data specific to HIV, extending beyond the health sector. Both approaches share common principles, such as the financing triangle—consumption, financing, and provision—and the alignment of spending to calendar/fiscal years. However, NASA's detailed tracking of HIV spending offers granular insights that SHA's broader health spending categories are not equipped to capture.

Research Aim: This paper examines the convergence and divergence between SHA and NASA, exploring how their processes and outcomes can complement each other and serve broader health and HIV expenditure tracking purposes, ultimately strengthening financial information systems, accountability and optimal use of resources.

Methods: The study employs a comparative analysis of SHA and NASA frameworks, data sources, and analytic techniques. It reviews case studies to identify commonalities and divergences in their approaches and outcomes. A detailed “crosswalk” between SHA and NASA classifications is generated to help country teams navigate both frameworks and map their spending lines appropriately.

Key Results: NASA tracks both health and non-health HIV/AIDS spending, including activities in sectors such as education (e.g., school programs on stigma reduction), social protection (e.g., cash benefits for people living with HIV/AIDS), and social development (e.g., empowerment activities). NASA categorizes HIV/AIDS spending along six broad dimensions: financing sources, financing agents, providers, production factors, spending categories, and beneficiaries. All these dimensions align with SHA dimensions, but NASA classifications within some dimensions (e.g., AIDS spending categories—ASCs) can be more detailed than those typically used by HA teams. Harmonizing HA and NASA resource tracking efforts can minimize data collection costs, reduce the reporting burden on implementers of HIV/AIDS programs, and ensure compatibility of HIV/AIDS spending estimates from both exercises. To enhance the utility of both frameworks, data from NASA can be cross walked into SHA classifications, allowing for the inclusion of non-health categories within SHA’s broader health-related functions. This approach ensures cross compatibility of HIV/AIDS expenditure data while maintaining the distinct strengths and focus of both frameworks.

Conclusions and Implications: Integrating SHA and NASA exercises, especially at the data collection stage, can enhance the comprehensiveness and utility of health spending data, supporting better resource allocation and policy-making. Countries can benefit from synchronized data collection and analysis, reducing duplication of efforts and costs. This synergy can provide a more holistic view of health and HIV expenditures spanning multiple sectors, aiding in the achievement of global health targets, strengthened financial information systems and improving the sustainability of health systems.

abs-os588 Progress and Challenges in Institutionalizing Health Accounts in the African Region

PRESENTER: **Ogochukwu Chukwujekwu**
AUTHORS: Maria Aranguren, Ke Xu, Sophie Faye, Hapsa Toure

Background: The institutionalization of Health Accounts (HA) is vital for utilizing health expenditure data to improve health system governance and financing. HA offers detailed insights into health expenditures, which are crucial for policy-making, planning, and resource allocation. Despite its acknowledged importance, the degree of HA institutionalization varies widely across countries. Previous research has emphasized the advantages of institutionalized HA and provided a global perspective on its progress. However, it has yet to identify the factors that could enhance HA institutionalization in the African region, which has been particularly active in producing HA over the past two decades.

Research Aim: This study aims to evaluate the state of HA institutionalization in African countries, identify the influencing factors, and highlight the challenges and facilitators of the institutionalization process.

Methods: The research utilizes a survey-based approach in 32 African countries, applying the HA institutionalization maturity framework developed by WHO. Countries are classified into two groups: those where the government fully funds staff and those where staff are either partially or entirely funded by private or external sources. The research uses the WHO HA Institutionalization index and descriptive statistics to provide insights into the HA institutional characteristics of African countries across different domains (demand, governance and financing, technical capacity, dissemination, and use).

Key Results: The results highlight that in 22 out of 32 African countries, staff are fully funded by the government, while the rest rely on external aid. Even in countries where the government fully funds staff, external sources are critical in funding other activities in the HA production cycle (e.g., data collection and surveys, training, reports, and policy briefs). Countries where staff are fully funded by the government tend to have a formal mandate compared to those where staff are not fully funded. Still, both groups often need more authority and resources to implement these mandates. Additionally, countries with fully funded staff by the government have more HA organizational structures, coordination mechanisms, and routine access to information on various types of health expenditures. Despite having better technical capacity, countries with fully funded staff still need procedures and incentives to maintain institutional knowledge. Countries where government-funded staff perform slightly better in disseminating HA, producing HA reports and relevant policy briefs. In contrast, those with partially or externally funded staff focus mainly on HA reports. However, both groups need to improve the timeliness of HA data production, update their databases annually, and make data more publicly accessible to enhance data quality and promote data use.

Conclusions and Implications: The institutionalization of HA in the African region has yet to be fully country-led, with HA production still

heavily dependent on external partners. This reliance results in significant variations in demand, governance, technical capacity, and dissemination practices. Securing sustainable domestic funding and building local capacity is crucial to address these challenges. Prioritizing HA production in policy agendas, integrating HA into evidence-based policy-making, and enhancing technical capacity through improved staff retention and training are essential steps towards achieving a more self-sufficient and effective HA institutionalization process.

8:30 AM –10:00 AM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

os230 Bali International Convention Centre – Bandung

Exploring the Health Economics of Genomic Newborn Screening

MODERATOR: **Anagha Killedar**, University of Sydney

CONVENER: **James Buchanan**, Queen Mary University of London

DISCUSSANT: **Zanfina Ademi**, Monash University

abs-os648 A Micro-Costing Analysis of Genomic Newborn Screening in England

PRESENTER: **Martin Vu**

AUTHORS: Melissa Hill, James Buchanan, Celine Lewis

Background

Routine genomic newborn screening (gNBS) could greatly enhance the detection of rare, treatable genetic disorders beyond what the current newborn screening (NBS) programme achieves. This provides opportunities for earlier intervention across many diseases to improve long-term outcomes. Over ten large-scale international prospective studies are currently generating evidence on the utility, feasibility and implementation of gNBS. One such study is the Generation Study, led by Genomics England, which aims to sequence the genomes of 100,000 newborns in England. Cost-effectiveness evidence will play an important role in decision-making regarding whether to roll out gNBS to the wider population, given that sequencing remains a relatively expensive technology compared to the biochemical and PCR-based genetic tests currently used in NBS programmes. It is therefore important to understand the resources and costs of delivering such a population-based screening programme. This study aims to estimate the costs associated with providing gNBS for infants as consented by their parents through the Generation Study compared with the current NBS programme.

Methods

We will present a time-driven activity-based micro-costing analysis of gNBS. The Generation Study protocol and consultations with key designers and implementers will be used to map out the processes, activities and resources consumed (e.g. labour, consumables and equipment) for the delivery of gNBS. Data collection will quantify staff involvement, time spent across different activities and resource usage, through clinical and laboratory staff interviews, trial and laboratory protocols and on-site hospital observations across six different sites across England. Hourly staff salaries will be derived from published salary scales (including those for the English National Health Service), and consumable costs will be determined based on purchasing orders and laboratory fees. Equipment cost calculations will factor in data on lifespan and sample throughput, with a 3.5% discount rate applied over this lifespan. The existing NBS programme costs will be estimated through healthcare professional interviews to assess consent and reporting times, and published literature to determine assay costs for the nine existing conditions screened in the UK. All costs will be expressed in 2024 GBP. Sensitivity analysis will be conducted to assess the impact of varying assumptions related to resource use, unit costs and sample throughput. Additional scenario analyses will consider the costs associated with modifying the current clinical service pathway to include gNBS.

Results

The gNBS workflow, from parent recruitment and consent through to sample collection, sequencing, genomic analysis, result return, and confirmatory testing for suspected infant conditions, has been charted onto a process map. Data collection to assess activity duration, quantities of consumables and equipment used is 60% complete at two sites. It will expand to four more sites in January 2025, with completion anticipated by March 2025.

Conclusions

The results of this micro-costing study will contribute to cost-effectiveness analyses of the use of gNBS in clinical practice in England. Evidence from these analyses will be used by key decision-makers (e.g. the UK National Screening Committee) to decide whether to expand the existing newborn screening programme to identify additional newborns with rare treatable genetic disorders.

abs-os644 Current Challenges and Potential Solutions When Evaluating the Cost-Effectiveness of Genomic Newborn Screening: A Long Road Ahead?

PRESENTER: **James Buchanan**

AUTHORS: Oliver Rivero-Arias, James B Chilcott, Hadley Stevens Smith

Background

Over the past five years there has been a growing interest in the use of genome sequencing to expand the scope of newborn screening programmes around the world. Several exploratory studies are currently exploring the risks and benefits of sequencing the whole genome of newborns at birth, including the Generation Study in England, the BabySeq Project in the USA, and BabyScreen+ in Australia. Many of these studies include a health economic evaluation. Evaluating the cost-effectiveness of genome sequencing in any context is challenging due to various well-documented methodological issues surrounding the measurement of costs and outcomes, uncertainty over the appropriate analytical approach, and weak data on the link between test effectiveness and patient outcomes. These challenges are exacerbated in a newborn context, in particular the measurement of health and non-health outcomes. The health technology assessment landscape for genomic newborn screening (gNBS) can also be complex.

This presentation will outline the challenges associated with evaluating the cost-effectiveness of gNBS. The approach to economic evaluation in the large gNBS studies underway around the world will be compared and contrasted, and potential solutions to some challenges will be proposed.

Methods

The challenges that health economists may face in this context were identified via discussions between the authors, informed by dialogue with screening experts and their experiences designing and evaluating existing newborn screening services. Challenges were grouped into categories that captured broad themes and steps when evaluating gNBS programmes. Information on analyses planned in current large gNBS studies was extracted from published sources.

Results

Six categories of challenges were identified. The first relates to cost-effectiveness modelling. Existing condition-by-condition modelling approaches may no longer be appropriate given that the number of screened disorders may increase from dozens to hundreds. Models also need to accommodate future expansions in gene lists, and uncertain data on gene penetrance and expressivity. A second category relates to evaluating outcomes. Few instruments exist to capture quality-of-life outcomes in newborns, and methods to combine benefits and harms for multiple stakeholders in one economic evaluation are still evolving. Further categories consider analytical scope (e.g. how to incorporate information on benefits across the life-course) and behavioural considerations (e.g. what factors impact on parental uptake). There are also issues surrounding the use of local versus global evidence, and the existence of multiple decision-makers within the same health technology assessment landscape. Key differences were identified across large gNBS studies – including different approaches to identifying a comparator population – that may lead countries and states to form different conclusions regarding the cost-effectiveness of gNBS. Potential solutions to the identified challenges include the development of new outcome instruments for this population, and global efforts to harmonise data collection to inform economic evaluations in this space.

Conclusions

Applying genome sequencing in the context of newborn screening could have a huge impact on health outcomes for newborns around the world. However, generating a robust economic evidence base to support implementation will not be straightforward – there is a long road ahead for health economists.

abs-os653 Discrete Choice Experiments to Inform the Evaluation and Implementation of Genomic Newborn Screening

PRESENTER: **Xiuqin Xiong**
AUTHORS: Riccarda Peters, Zornitza Stark, Ilias Goranitis

Background

Integrating genomic sequencing into newborn screening (NBS) programs provides an opportunity to significantly increase the early identification of rare genetic conditions. Various large-scale projects are underway to assess the feasibility of genomic NBS (gNBS), including BabyScreen+ in Australia. When considering introducing such a screening program at scale, it is crucial to consider societal values and beliefs. Using the example of gNBS, this presentation will focus on how discrete choice experiments (DCEs) can be used for the evaluation and translation of genomic technologies. The results of two discrete-choice experiment surveys will be discussed. The first DCE aimed to elicit the value of gNBS relative to standard NBS from members of the general public to inform an economic evaluation of BabyScreen+ (value DCE). The second DCE focused on preferences for the implementation of a gNBS program (implementation DCE).

Methods

Bayesian D-efficient designs were created. The value DCE employed an explicit partial profile design, whereas the implementation DCE utilised an implicit partial profile design. Data was collected from 1504 and 1005 members of the general public, respectively. The value DCE included six attributes, investigating preferences regarding conditions included in the screening program (severity, penetrance and treatment availability), performance of the screening program (diagnostic yield, accuracy), and cost of gNBS. The second DCE focused on eight attributes related to the implementation of gNBS, such as when and with whom gNBS should first be discussed and how results from gNBS should be returned. Survey data was analysed using a panel error component mixed logit model and a latent class model. Preference heterogeneity was explored using fractional logistic regression.

Results

Statistically significant preferences were identified across all attributes in the value DCE. Participants valued broad inclusion criteria for conditions included in gNBS, favouring screening programs that also provided information about conditions with mild severity, lower penetrance and conditions for which treatments may not be available yet. They further expressed preferences for higher diagnostic yield, accuracy, and lower costs. Preference heterogeneity was identified and associated with some sociodemographic characteristics. Willingness-to-pay estimates on the value of gNBS have been calculated and will be presented. For the implementation DCE participants valued who should provide information about gNBS, what support material should be available, who should return high-chance results and how high- and low-chance results should be returned.

Conclusions

DCEs offer valuable data sources for economic evaluation and decision-making. We demonstrate how DCEs can provide insights into the public's valuation of gNBS programs, including likely uptake and willingness-to-pay for such a service. The findings also highlight the importance of several aspects of service delivery that should be considered for the implementation of gNBS in Australia.

8:30 AM –10:00 AM MONDAY [Evaluation Of Policy, Programs And Health System Performance]

os31 Bali International Convention Centre – Denpasar B

Taiwan National Health Insurance System's 30 Years of Journey: Progress and Challenges

MODERATOR: **Hong-Jen Chang**, National Yang Ming Chiao Tung University

CONVENER: **Jui-fen Rachel Lu**, Chang Gung University

DISCUSSANT: **Winnie Yip**, Harvard University; **Karen Eggleston**, Stanford University

abs-os171 How Does the Hospital Market Respond to Universal Health Insurance?

PRESENTER: **Shin-Yi Chou**

AUTHORS: Hsien-Ming Lien, Chia-Lun Liu, Mary Deilye

Background The implementation of Taiwan’s National Health Insurance (NHI) in 1995 represented a major policy reform aimed at achieving equitable healthcare access and cost containment. While the positive effects of universal health coverage on patient outcomes are well-established, its implications for healthcare supply and market dynamics remain less understood. By altering the financial and regulatory landscape, the NHI reform likely disrupted the existing equilibrium in the hospital sector, prompting shifts in demand, pricing, and hospital operations. **Research Aim** This study investigates the impact of universal health insurance reform on healthcare supply, specifically examining how Taiwan’s NHI influenced the structure of the hospital sector. Additionally, it explores whether changes in market structure affected the quality of care, assessed through medical inputs and patient outcomes. **Methods** We utilize the 1990 census data to construct a measure of the NHI impact, alongside registry files from 1990-2001 and hospital utilization survey data to examine the NHI impact on the hospital market. To isolate the causal effects of these changes on hospital behavior and market structure, we adopt a treatment effect approach, comparing regions with higher pre-reform uninsured rates to those with lower rates. This strategy identifies the differential impacts of NHI-induced shifts in demand and pricing on hospital operations, while accounting for time-invariant regional characteristics and overarching national trends. Using 1990 census data, registry files from 1990-2001, and hospital utilization surveys, we construct a measure of the NHI’s impact on the hospital market. To identify causal effects, a treatment effect approach is employed, comparing regions with higher pre-reform uninsured rates to those with lower rates. This method captures the differential impacts of NHI-induced changes in demand and pricing on hospital behavior, while controlling for time-invariant regional characteristics and broader national trends. **Key results** We find the reform resulted in a significant decrease in the number of hospitals, and that most of those exiting were small hospitals that offered fewer services and employed fewer doctors. Examination of the input choices and utilization rates of individual hospitals shows that large hospitals increased staffing levels and other inputs, and experienced higher utilization rates, while small hospitals did not; instead, many became clinics. **Conclusion** The findings indicate that universal insurance facilitated the growth and expansion of large hospitals, while small hospitals either downsized or exited the market altogether. This highlights how universal health reforms can significantly reshape healthcare supply and market structure. Nonetheless, we do not find evidence showing that the market structure affects the quality of care, either medical input or patient’s outcome.

abs-os203 The Formulary Under the National Health Insurance in Taiwan in 30 Years: Price, Volume, Markup, and New Drugs Adoption

PRESENTER: **Meng-Chi Tang**

This paper uses the complete prescription records for one million Taiwanese patients from 1997 to 2011 and examines the slow drug adoption of newly introduced active ingredients. Our analysis reveals that, on average, these drugs require four to five years to reach substantial adoption across varied therapeutic classes. A mover-based instrumental variable approach exploits physician relocations to identify sizable peer effects: a one-percentage-point increase in peers' prescription rates raises a physician’s probability of prescribing by 0.4 percentage points in ordinary least squares and up to 0.8 with the instrument. We further show that adoption speed is shaped by local hospital settings, patient complexity, and demographic alignment among physicians. At the macro level, markets dominated by clinics exhibit slower diffusion, while academic institutions accelerate uptake. These findings underscore the crucial role of physician networks in accelerating new treatments, highlighting how targeted interventions could improve timely and equitable access to innovative therapies.

abs-os296 Beyond Coverage: Evidence, Equity, and the Need for Transparent Data on Out-of-Pocket Health Expenditures in Taiwan

PRESENTER: **Christy Pu**

Background: Out-of-pocket (OOP) health expenditures represent a critical factor in global health policy as they directly impact financial risk protection, health equity, and access to health-care services. Taiwan's National Health Insurance (NHI) system is internationally regarded for its extensive coverage, serving as a model for universal health care. However, OOP health expenses in Taiwan remain underanalyzed. With constrained reimbursements from NHI, hospitals increasingly rely on OOP payments, which now constitute approximately 25%-40% of their total revenue. A primary challenge within Taiwan is the lack of a standardized international framework, such as the System of Health Accounts (SHA), for systematically analyzing OOP expenditures. **Research Aim:** This presentation provides an overview of Taiwan's OOP expenditures, followed by an empirical analysis of the inequalities associated with these expenditures in the country. **Methods:** We utilized three data sources. First, we employed Taiwan's Household Income and Expenditure Survey to measure the prevalence of catastrophic health expenditures, the concentration index, and the Kakwani index over time. Although informative, this survey does not adjust for private health insurance reimbursements and is not based on the SHA standards. To address these limitations, we included another nationally representative survey, designed according to the SHA framework, to investigate equity issues related to OOP spending in Taiwan. Additionally, we focused on a disadvantaged subgroup—individuals with disabilities—to assess whether they bear a disproportionate financial burden from OOP expenses under NHI. **Key Results:** Our findings, based on the SHA definition, indicate that in 2021, OOP payments accounted for 29.6% of Taiwan's national health expenditure (NHE), with curative care (HC.1) comprising 50.1% of this total. Notably, around 39% of OOP spending is attributed to medical goods (HC.5), including items like wheelchairs, thermometers, and other medical supplies typically uncovered by NHI. This high expenditure on non-covered medical goods highlights a significant gap in NHI coverage that warrants policy consideration. Additionally, long-term care expenses, another contributor to OOP under the SHA framework, are often managed by departments outside of NHI administration. In 2022, Taiwan's Ministry of Health and Welfare reported that the private sector financed 56.7% of total long-term care costs, further demonstrating the extensive reach of OOP expenses beyond direct NHI coverage. Our analysis also indicates that there is a significant number of households facing catastrophic expenditure. Based on the SHA-based survey conducted in 2022, OOP payments are pro-rich but regressive. This means that, in absolute terms, the wealthy incur higher OOP payments. However, lower-income groups bear a disproportionately higher share of these costs relative to their income compared to higher-income groups. Notably, individuals with disabilities, as a disadvantaged group, incur high OOP costs. **Conclusion/policy implication:** Despite the NHI system, OOP healthcare expenditure in Taiwan remain significant. However, OOP expenses may not be directly related to essential curative care. in Taiwan, OOPs can be regressive from the perspective of both income and health status. Special policy consideration should be given to vulnerable populations, including individuals with disabilities. 1

abs-os298 Exploring a Public-Private Partnership Model to Enhance Financial Risk Protection

PRESENTER: **Jui-fen Rachel Lu**, Chang Gung University

Background A primary objective of the National Health Insurance (NHI) system is to provide financial risk protection to individuals seeking medical care. However, limited resources have led to unmet demands for innovative and life-saving treatment options. Since the NHI's establishment, many have opted to purchase supplementary or complementary private insurance to bolster their financial risk protection, driven by increasing real incomes. Unfortunately, existing private insurance policies often fall short in adequately covering the needs of critically ill patients. There are growing indications that out-of-pocket expenses for patients are steadily rising, and the unmet medical needs within the population pose a significant challenge that the NHI must confront effectively. **Research Aim** This study aims to develop a feasibility framework for a public-private partnership (PPP) between the NHI and private insurance to enhance financial risk protection through integrated supplementary private insurance coverage. **Methods** The research commenced with a comprehensive comparative analysis and a systematic literature review, supplemented by consultations with various international experts and scholars. This investigation focused on the role of private insurance in providing financial risk protection through supplementary coverage. Following this, a feasibility framework was developed through several rounds of stakeholder consensus meetings, incorporating insights from global best practices. **Key Results** The proposed feasibility framework builds upon the existing NHI, envisioned as a "second layer" of insurance policy. This structure stipulates that private market medical insurance must align with government policy objectives. In exchange, the government would offer administrative support—including premium collection and standardized claim filing systems—aimed at reducing the administrative burden on private insurers and making premiums more affordable for the general population. Under this PPP model, private insurance would operate as the insurer, following a financial principle of breaking even (no excessive profits). In the initial phase, the model would facilitate open enrollment, allowing all willing Taiwanese participants to join without excluding those with pre-existing conditions, with the government assuming financial risk for these individuals. While insured participants would bear the full cost of their premiums, government subsidies would be available for low-income individuals and other economically disadvantaged groups. Premium rates would adhere to community rating principles or simplified experience rating (adjusted solely by age) and would be reviewed periodically. **Conclusion and Policy Implications** The government must conduct thorough assessments to determine the costs associated with administrative support for insurance and financial responsibilities for enrollees with pre-existing conditions. Strengthening financial risk protection in healthcare will necessitate ongoing discussions focused on evaluating the government's financial commitments between "expanding the scale of the existing NHI" and an "enhanced medical protection policy insurance." Additionally, strategic incentives will be needed to encourage private insurance entities to engage in this public-private partnership model.

os41 Bali International Convention Centre – Bougainville

Navigating Value, Access, and Transparency in Healthcare

MODERATOR: **Ou Yang**, University of Melbourne

DISCUSSANT: **Henry Cutler**, Macquarie University, Sydney; **Susan Méndez**, University of Melbourne; **Yuting Zhang**, University of Melbourne

abs-os31 Excess Capacity and Low Value Care in a Mixed Public-Private Health System: The Case of Invasive Coronary Angiography

PRESENTER: **Mr. Jongsay Yong**, University of Melbourne
AUTHORS: Mr. Ou Yang, Vijaya Sundararajan

Objective: This paper investigates low value care in relation to the use of invasive coronary angiography (ICA) for stable ischaemic heart disease (sIHD). Unnecessary healthcare expenditure, overuse or low value care has been a policy concern in many countries. However, in practice it is difficult to detect due to unobserved patient factors that may necessitate more extensive care than indicated by guidelines. Guideline inconsistent care can be either appropriate or low value care. Methods: We propose a novel approach of using short-term capacity fluctuations to identify the presence of low value care in the use of ICA and investigate the difference between public and private hospitals in this practice. We make use of hospital administrative data from the state of Victoria, Australia. The data contain 59,192 episodes of ICA use for sIHD during a ten-year period, 2001/02--2010/11. We develop a proxy measure for short-term hospital capacity for ICA and allow for potential endogeneity of capacity using weekends as our instrument. we estimate linear and probit models as recursive bivariate models, with endogenous capacity interacting with other covariates in the model. Results: We find that guideline inconsistent use of ICA is about 30 percentage points more prevalent during periods of excess capacity, indicating the likely presence of low value care. We further find that private hospitals were more likely to engage in guideline inconsistent ICA use, and this tendency increases during periods of excess capacity. Conclusions: Using short-term capacity fluctuations to identify low value care, we find evidence of low value use of ICA and the incidence is greater in private than public hospitals. Further work is required to understand the interaction of consumer demand and provider characteristics in driving low value ICA use, so that appropriate policy response can be developed to reduce the incidence.

abs-os32 Impact of the GP-Specialist Referral Network on Referral Waiting Times and Out-of-Pocket Costs

PRESENTER: **Yuting Zhang**, The University of Melbourne
AUTHOR: Mr. Ou Yang

Objectives: Australia's universal healthcare system, Medicare, faces a significant challenge with rising waiting times to see medical specialists. Psychiatry has emerged as one of the most sought-after medical specialties outside of hospital settings, receiving substantial subsidies from Medicare. Nevertheless, there is a notable lack of evidence regarding waiting times for psychiatric specialist consultations for general outpatients in Australia. In a setting where fees are unregulated and patients receive a fixed subsidy from the government, as is the case in Australia, limited evidence exists on the major factors influencing psychiatric specialist pricing behaviour and their interactions with patients. Our study aims to bridge this gap in the literature by taking an innovative perspective and investigating how the General Practitioner (GP)-Specialist referral pattens affect specialist consultation waiting times and patients' out-of-pocket costs. Methods: We analyse all records of Medicare-rebated GP referrals to psychiatric specialist across Australia from Q1 2011 to Q3 2023 sourced from the Medicare Benefits Schedule (MBS) data collection within the Person Level Integrated Data Asset (PLIDA). We apply a fixed effects linear regression which respectively relates waiting times and patients' out-of-pocket costs for all non-hospital psychiatric services to GP-Specialist quarterly referral network concentration, controlling for specialist fixed effects. The quarterly GP-Specialist referral network concentration is measured by the well-known Herfindahl–Hirschman Index (HHI). As a robustness check, the regression is also run with a categorical variable, constructed based on the HHI, instead of the original continuous HHI, to capture the non-linear effects of the quarterly GP-specialist referral network concentration. Results: Our findings indicate that higher GP-Specialist referral network concentration leads to lower consultation waiting times; however, this comes at the cost of higher out-of-pocket expenses for patients. Both effects are statistically significant. Specifically, the average specialist consultation waiting time decreases by approximately 6 percent when comparing GPs with the highest referral network concentration to those with the lowest concentration. In contrast, patients' out-of-pocket costs are about 1 percent higher. Discussion: The research findings reveal a trade-off between lower waiting times and higher out-of-pocket costs for patients due to increased GP-Specialist referral network concentration. Policymakers should balance access and affordability, potentially through measures like monitoring specialist pricing, enhancing competition, implementing targeted subsidies, and incentivizing efficient referral practices. Continuous monitoring and a multi-faceted approach are crucial to address market power concerns and ensure an equitable healthcare system.

abs-os33 The Impact of Price Transparency on Patients Medical Costs for In-Hospital Services

PRESENTER: **Ms. Susan Méndez**, University of Melbourne
AUTHORS: Anthony Scott, Hana Sabanovic, Mr. Jongsay Yong, Camille La Brooy, Adam Elshaug, Khic-Houy Prang

A reason for market failure in healthcare is information asymmetry. Patients face considerable uncertainty about expected health and financial outcomes because they might be less likely to assess the complexity of their case or the type of services they require. In a setting where providers can freely set prices, patients face uncertainty in their expected fees and out-of-pocket costs. Price transparency is promoted as a key to empowering patients with information, and fostering more equitable healthcare decision-making processes. Objectives: We study the impact of two price transparency initiatives on medical costs for private in-hospital services in Australia. The first initiative is the Surgical Variance

Reports, published in 2016 by the Royal Australasian College of Surgeons to reduce variation in clinical outcomes. The reports also included information about surgeons out-of-pocket costs. They were targeted at surgeons but publicly available. The second initiative is the launch of a price comparison website in 2018 designed to help members of the insurance company find the location of specialists around their area and their expected cost when undergoing a procedure in a private hospital. Methods: We use administrative claims data from the largest private health insurance company in Australia. The data spans from 2014 to 2019 and it links records from over 1.6 million patients to the doctors who provided their care while undergoing treatment in a private hospital. The detailed information allows to risk-adjust for patient complexity. We compare the evolution of fees and out-of-pocket costs from targeted procedures exposed to price transparency to costs of procedures not exposed in the initiatives with a difference-in-difference approach. Results: We find a significant increase in fees for procedures that were included in the Surgical reports. We also show a decrease in fees after the introduction of the insurance company's webpage. Conclusions: While providing price information effectively promotes search and choice in other industries, it may be less effective in healthcare. Price transparency alone does not remove uncertainty in quality and doctors' perceived experience and skills can still drive price variation. In addition, the state of urgency and stress might hinder patients' ability and willingness to compare options before choosing their preferred provider.

abs-os30 Understanding Views on Value Based Mental Healthcare Payment Reform in a Complex Healthcare System. The Australian Experience

PRESENTER: **Henry Cutler**, Macquarie University
AUTHORS: Anam Bilgrami, Jonas Fooken, Frances Rapport, Alicia Norman, Mona Aghdaee

Objectives: Many developed countries have fragmented mental healthcare systems with costly care that is misaligned with patient preferences. To improve the integration of care, payers are exploring new payment methods that promote collaboration and care integration among multiple providers. Our study aimed to provide insights and recommendations for shifting mental health care payment models away from traditional fee-for-service toward innovative models that pay for outcomes. Methods: We gathered data by interviewing 21 executives from state and federal government departments, agencies, and mental health commissions in Australia. We also conducted three national online workshops with 70 non-government stakeholders, consumers, and public participants. Responses were transcribed and analysed to identify common themes using thematic and schema analysis methods. These themes were organized using the Consolidated Framework for Implementation Research (CFIR) to offer a concise overview of stakeholder perspectives. Results: Stakeholders generally agreed on the need for value-based payment models in mental healthcare, but there were differing opinions on how these new models should be governed in a federated system like Australia. Primary barriers to implementation included defining outcomes that matter to consumers, lack of evidence, workforce gaps, political complexities, procedural challenges, and costs. Contrasting perspectives between government and non-government stakeholders highlighted ideological differences that may need to be addressed before implementing payment reforms. Discussion: Reforming payment models in mental healthcare is complex and challenging, magnified by the often-large uncertainty in attributing outcomes to care. This paper offers potential recommendations for implementing outcomes-based payment reform at scale in mental healthcare, across areas such as governance and planning, evidence-based care promotion, and laying the groundwork for reform.

8:30 AM –10:00 AM MONDAY [Demand & Utilization Of Health Services]

os71 Bali International Convention Centre – Dahlia

Quality and Demand in Mixed Primary Health Care Systems: Evidence from the Soweto Primary Care Study

MODERATOR: **Charles Hongoro**, Human Sciences Research Council

CONVENER: **Duane Blaauw**, Centre for Health Policy, University of the Witwatersrand

DISCUSSANT: **Manoj Mohanan**, Duke University; **Elisa Maffioli**, University of Michigan

abs-os246 Comparing the Quality and Efficiency of Primary Care Providers in Soweto. A Standardised Patient Audit

PRESENTER: **Duane Blaauw**, University of the Witwatersrand
AUTHORS: Mylene Lagarde, Olukemi Babalola, Nicholas Stacey

ABSTRACT

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Access to quality primary health care (PHC) is essential for addressing health inequalities in South Africa. However, effective strategic purchasing and regulation for PHC within a new National Health Insurance (NHI) system will require better information about the relative quality and costs of different providers.

The objective of the study was to compare the quality and efficiency of acute care provided by different PHC providers in Soweto. We used a standardised patient (SP) audit survey to evaluate the effort, quality and efficiency of PHC providers. SPs are fieldworkers trained to consistently portray a specific clinical case, attend health care providers as normal patients, and then accurately record details of the consultation. SPs presented five different clinical cases: angina, tuberculosis (TB), asthma, migraine and post-partum depression (PPD). They were sent to 33 public clinics, 75 private general practitioners (GPs) and 19 private mid-level worker (MLW) clinics in Soweto. Consultation

details were recorded immediately after each visit on a tablet-based questionnaire. We compared indicators of provider effort, technical quality, patient-centredness and efficiency.

A total of 793 consultations were completed: 328 in public clinics, 374 with private GPs and 91 at private MLW clinics. We found low technical quality of care across all three groups, with only 40% of cases managed according to evidence-based guidelines. Private GPs performed slightly better than other providers managing 45.2% of the SPs correctly, compared to 38.1% in public clinics and 37.4% by private MLW clinics. Low sputum testing of the TB case was a concern though management of the PPD case was better than expected. We also found significant wastage with over-prescribing of unnecessary and harmful medicines especially in the private sector. Problems with patient-centred care were mostly reported from public clinics.

The technical quality of care, patient-centredness and wastefulness of PHC providers requires improvement in order to provide more cost-effective care. Private providers may provide slightly better quality care but are also less efficient. Strengthening the quality and efficiency of PHC across both the public and private sectors is imperative if NHI is to be successful in promoting equitable health outcomes.

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abs-os255 Examining Patient Choice and the Role of Quality Information in Healthcare Markets in South Africa

PRESENTER: **Nicholas Stacey**
AUTHORS: Olukemi Babalola, Mylene Lagarde, Duane Blaauw

ABSTRACT

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Reforms that rely on private providers to deliver care, such as those envisaged in South Africa, are premised on the notion that the effect of market competition will increase efficiency, quality and sensitivity to consumers. However, insights from economic theory suggest a more nuanced picture, and in particular highlight the important consideration of whether the demand side is indeed responsive to quality. In settings where consumers are not able to judge the quality of services, such as healthcare markets, it is widely held that giving information about provider quality would improve the responsiveness of demand, and therefore the allocative efficiency of the market. Yet there is hardly any evidence of responsiveness of demand to information and quality in healthcare markets in low- and middle-income settings.

The project aims to inform the policy debates in South Africa around the introduction of a national health insurance (NHI) scheme by answering two questions:

1. To what extent do patients choose healthcare providers based on quality versus other attributes (proximity, type of providers, reputation, etc)?

2. Does information about provider quality influence patients' choice of providers?

To answer the first question, we use detailed healthcare utilisation data collected from approximately 850 households in Soweto during a three-month period where they had free access to a small network of public and private providers. We fit a choice model that analyses provider choice as a function of provider characteristics: distance to household, perceived quality and attitude (both elicited at baseline), type of provider (private or public), and expected provider category (nurse or doctor).

To answer the second question, we extended the free access to providers by an extra two months and randomly allocated half of the household clusters to receive information about the best two providers in the network. We monitor household choice of providers over the period and collect information about provider preferences and information spillover at endline.

Results show that proximity and ease of access, more than quality, is the key factor that determines choice of providers. Even equipped with information about quality of providers, most individuals continue to choose the closest providers, rather than the better ones. Findings illustrate the inelasticity of the demand with respect to quality compared to barriers such as distance. Those results also cast doubts on the notion that healthcare markets can operate efficiently.

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abs-os252 Free Access, Indirect Barriers and Healthcare Efficiency: Experimental Evidence from Soweto

PRESENTER: **Mylene Lagarde**, London School of Hygiene & Tropical Medicine (LSHTM)
AUTHORS: Nicholas Stacey, Olukemi Babalola, Duane Blaauw

ABSTRACT

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Despite free access to public health care in South Africa, barriers such as long waiting times and perceptions about poor quality may inhibit optimal healthcare utilisation. Plans to expand private sector access through National Health Insurance (NHI) could modify these patterns, but the likely impacts on utilisation remain uncertain and may depend on the location of contracted providers.

The objective of this study was to assess the impact of providing access to private PHC providers in Soweto on healthcare utilisation,

appropriate health-seeking and healthcare spending, and to investigate if distance influences these effects. A randomised controlled trial was conducted with 1400 households without private health insurance and children under six. Households were randomly assigned to three groups: a control group with standard public healthcare access, a group with access to a network of nearby private providers, and a group with access to more distant private providers. The health card intervention granted free private PHC access for one child for three months. Caregivers used a pictorial diary to capture daily symptoms and health care visits. Fieldworkers completed surveys at baseline and endline, and also visited households weekly to collect the diary information. We applied the WHO community IMCI guidelines to the diary data to determine whether health provider visits during illness episodes were appropriate or unnecessary. We also identified episodes with under-use where care was not sought although the guidelines recommended it.

Free access to private providers increased healthcare usage, with the highest care-seeking in the nearby provider group. Although free private care doubled appropriate care-seeking, it also led to a significant rise in unnecessary visits. Importantly, the rate of underuse remained unchanged. Pharmacy spending decreased but transport costs increased, particularly for the far-network group. Distance did influence utilisation, with further travel reducing both appropriate and unnecessary visits.

Expanded access to private PHC providers increased beneficial healthcare utilisation but also increased low-value visits. Unfortunately, it did not improve the problem of under-use. The implementation of NHI needs to consider and plan for the likely effects on household healthcare utilisation patterns.

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8:30 AM –10:00 AM MONDAY [Health, Its Valuation, Distribution And Economic Consequences]

os86 Bali International Convention Centre – Orchid

Measuring and Valuing Health-Related Quality of Life in Infants, Toddlers, and Young Children

MODERATOR: **Lisa Gold**, Deakin University

CONVENER: **Christine Mpundu-Kaambwa**, University of Melbourne

abs-os618 Challenges in Evaluating Health-Related Quality of Life (HRQoL) in Children: Selecting the Value-set for the EQ-5D-Y-3L

PRESENTER: **Diana Khanna**
AUTHORS: Christine Mpundu-Kaambwa, Jyoti Khadka, Rachel Milte, Julie Ratcliffe

Objective: There is limited guidance on whether to apply a child-specific value set from another country or use a country-specific adult EQ-5D-3L value set when the former is unavailable. This study aims to examine how the choice of value set, i.e., child- versus adult-specific, influences the inter-rater gap between child self-reported and proxy-reported health-related quality of life (HRQoL).

Methods: An online sample of 845 dyads (children aged 6-10 years and their parents) completed the self and proxy versions of the EQ-5D-Y-3L independently. HRQoL values were derived using the 'Y' and the adult-specific value sets for five countries: Germany, Hungary, Japan, Netherlands and Spain. Analyses were stratified by age (6-7 versus 8-10-year-olds), gender, and health condition. Group differences were identified using paired t-tests with a Bonferroni corrected significance level (α=0.0014). The percentage of directional consistency in child-proxy discrepancies across value sets was also examined as a secondary analysis.

Results: Proxies significantly overestimated HRQoL values across most 'Y' value sets (Hungary, Japan, Spain); marginal significance was observed for Germany and the Netherlands. Similar pattern using the corresponding 'adult' value sets was observed only for Germany. Significant inter-rater differences were observed for children without health conditions across all value sets. Proportional agreement in direction was marginally higher when using 'Y' value sets, except for Germany.

Conclusion: The choice of value set influences child-proxy HRQoL assessments. In the absence of a country-specific 'Y' value set, using an alternative child-specific value set is preferable to relying solely on a country-specific 'adult' value set.

abs-os687 Exploring Valuation of the Adapted EQ-5D-Y-3L for 2-4 Year Olds: A Qualitative Think-Aloud Study

PRESENTER: **Alexander van Heusden**
AUTHORS: Kim Dalziel, Renee Jones, Brendan Mulhern, Alice Yu, Nancy Devlin

Objective

This study aims to qualitatively explore the views of the general public regarding valuation of HRQoL in young children, 2-4 year olds, including 1) whose preferences should be sought 2) which perspective should be used 3) what age framing to use, 4) whether and how participants consider spillover effects, and 5) the feasibility of completing a discrete choice experiment (DCE) task for the adapted EQ-5D-Y-3L for 2-4 year olds.

Methods

Individual online semi-structured think-aloud interviews were conducted with Australian adults, including both parents/caregivers and non-parents. The interview consisted of six think-aloud DCE tasks (imagining a hypothetical 3-year-old) using health states derived from the adapted EQ-5D-Y-3L for 2-4 year olds, followed by a range of open-ended questions to explore the key aims. Interview transcripts were double coded using an inductive and deductive approach and analysed using framework analysis.

Results

Interviews were conducted with 17 adult participants, including parents/caregivers (n=9) and non-parents (n=8). Almost all participants found the DCE task easy to understand and reported high confidence completing the task. Participants' emphasised the inclusion of preferences from parents/caregivers or professionals who interact with children. Despite asking participants to consider a hypothetical child, participants tended to instinctively think of themselves as a child, their own child, or a child they know. All participants stated that they would respond differently if asked to consider an older child (e.g. a 10 year old). Caregiver spillover effects were observed in valuation task considerations made by many parents/caregivers (e.g. how the child's health state impacts the parent's life), whereas future spillover effects (e.g. impacts on children's future health and non-health prospects) were considered by many of the total sample. Almost all participants used information beyond the description of the task when making decisions, such as imagining if health states were treatable.

Conclusions

DCEs tasks appear to be feasible for obtaining stated preferences of dimension importance for the adapted EQ-5D-Y-3L for 2-4 year olds. There was strong preference for inclusion of those with experience of young children for valuation. It is important for those conducting or using results from valuation studies to understand the types of considerations being made and the extent to which spillovers are being incorporated in participant's valuations of health states for young children.

abs-os611 Methodological Study to Develop a Short Form of PedsQL Infant Scale to Measure Preference-Weighted HRQoL for Children Under 2 years

PRESENTER: **Xinyang Hua**, University of Melbourne
AUTHORS: Valerie Sung, Kim Dalziel

Background

Limited instruments are available to measure health-related quality-of-life (HRQoL) for children under age two. The PedsQL Infant Scale (36 and 45 item) was designed as a generic HRQoL instrument for infants aged 1-24 months. However, it is not a preference-weighted measure and thus cannot be directly used in economic evaluation.

Aim

To develop a short form of the PedsQL Infant Scale to measure preference-weighted HRQoL for children under two years of age, enabling its application in economic evaluation.

Methods

Data from the BabyBiotics study was used in this analysis. BabyBiotics is a randomised controlled trial to determine whether the probiotic Lactobacillus reuteri reduces crying or fussing in a broad community-based sample in Melbourne, Australia. Infants with colic aged less than 3 months were included in the trial, with the PedsQL Infant Scale collected 6 months after the intervention. Confirmatory factor analysis was conducted to identify the core dimension structure of the new health state classification system based on the PedsQL Infant Scale. Three competing conceptual models were tested: (a) the original 5-dimension structure of the PedsQL Infant, (b) a modified version with the lowest loading factors omitted, (c) a modified version with 2 single-item dimensions (Play, Hurt) isolated consistent with other available HRQoL instruments for children under two. Model fit was evaluated by examining standardised factor loadings and various fit indices. Rasch analysis and psychometric analysis will be used to select the best item for each dimension in the next step of analysis.

Results

132 infants with the PedsQL Infant data available at a median age of 8.5 months were included in this study. The original structure of the PedsQL Infant Scale had acceptable fit indicators (Tucker-Lewis Index (TLI)=0.969, Root Mean Square Error of Approximation (RMSEA)=0.051), with relatively low loading for item 6 (Being constipated, loading=0.312) and item 8 (Having diarrhoea, loading=0.399) in the Physical Symptoms dimension. Taking out these items or isolating play and hurt as single-item dimensions results in a similar model fit to the base model (TLI =0.968-0.971, RMSEA=0.53-0.55).

Conclusion

The original 5-dimension structure of the PedsQL Infant Scale exhibited adequate model fit in this Australian community-based sample of children under 12 months. Further quantitative exploration and engagement with experts will be made to determine the best model structure, and to select a single best item for each dimension. This study will provide a short form of the PedsQL Infant Scale that is amenable to preference elicitation methods and to calculate utilities for children under two years.

abs-os646 Psychometric Properties of the EQ-5D-Y-3L Self-Complete Version for Bangladesh: Testing Feasibility, Reliability and Validity

PRESENTER: **Marufa Sultana**, Deakin University
AUTHORS: Shakhawat H Rana, Md Badruddin Saify, Mimmi Åström, Rumana Huque, Shumia Islam, Ms. Lisa Gold

Background

Assessing Health-Related Quality of Life (HRQoL) in children is crucial for healthcare decision-making. The EQ-5D-Y-3L is a simple tool consisting of five dimensions (mobility, looking after myself, doing usual activities, having pain or discomfort, feeling worried, sad or unhappy) with three response levels (no problem, some problems, a lot of problems) and a visual analogue scale (VAS) to assess the current health status of children aged 8–18 years. This study, for the first time, piloted the self-complete Bangla version of EQ-5D-Y-3L among school children in Bangladesh to assess the feasibility, reliability, and validity of the tool, as well as exploring differences in HRQoL between age groups, sex, and geographical locations.

Methods

Children and adolescents attending primary or secondary level public schools were recruited from two districts in Bangladesh (one urban, one rural). Children aged 8–18 years completed the Bangla versions of the EQ-5D-Y-3L and KIDSCREEN-27 questionnaires, along with a few acceptability-related qualitative questions, at baseline, and a sub-sample repeatedly answered the EQ-5D-Y-3L one week later. The psychometric performance of the EQ-5D-Y-3L was assessed in terms of: (a) feasibility (missing values, completion time, acceptability); (b) test-retest reliability, using expected agreement and Prevalence-Adjusted and Bias-Adjusted Kappa (PABAK), with recommended values for reliability being a Kappa of ≥0.70 for strong agreement; and (c) convergent validity, by Spearman's correlation coefficients between the EQ-5D-Y-3L dimensions and KIDSCREEN-27 scales, with a value for strong correlation as ≥0.50. Variations in proportion of reported problems were assessed based on age, sex, and geographical location.

Results

A total of 120 children/adolescents participated, with a mean age of 13.1 years (SD ± 2.8); 37% were aged 8–11 years, and 52% were from urban areas. The mean completion time of EQ-5D-Y-3L with VAS was 5.2 minutes (SD ± 2.0), with no missing responses. Overall, 48% of participants reported no problems across all five dimensions (profile 11111), followed by 16% reporting 11121. 'Some/a lot of problems' were most reported in the having pain or discomfort dimension (36%) and the feeling worried, sad or unhappy dimension (30%). Test-retest reliability indicated strong agreement for the mobility, looking after myself, and doing usual activities dimensions (PABAK ≥ 0.70), but poor agreement for the having pain or discomfort dimension (PABAK = 0.06). Overall, convergent validity between the EQ-5D-Y-3L and KIDSCREEN-27 indicated weak correlation ($r \leq 0.30$). Reports of any problems in the feeling worried, sad or unhappy dimension were significantly higher among 15–18 year-olds (56%) compared to other age groups ($\chi^2 = 11.3$, $p < 0.01$) and higher among urban respondents (39%) compared to rural ($\chi^2 = 8.6$, $p < 0.01$). Any problems in the having pain or discomfort dimension were reported more frequently by female participants (43%) compared to males (28%).

Conclusions

The Bangla version of the EQ-5D-Y-3L demonstrated feasibility and reliability for measuring HRQoL among children in Bangladesh, although convergent validity showed a weak correlation between the EQ-5D-Y-3L and KIDSCREEN-27 dimensions scores and needs to be further explored.

10:00 AM –10:30 AM MONDAY [Social Events]

Bali International Convention Centre – BICC Foyers

Refreshment Break

10:30 AM –12:00 PM MONDAY [Health Care Financing & Expenditures]

Bali International Convention Centre – Nusantara 1

Health Financing Equity and Universal Health Coverage

MODERATOR: **Ching-Ching Claire Lin**,

Ind-1473 Social and Developmental Impact Bonds in Achieving Universal Health Coverage in Low-and-Middle Income Countries

PRESENTER: **Natasha Ogeto**

Background: Sustainable Development Goal (SDG) 3.8 is dedicated to achieving Universal Health Coverage (UHC). The coverage of essential health services and financial protection from catastrophic health spending are both indicators of progress towards the SDG. Out-of-pocket

expenses account for 40% of health expenditures in Low-and-Middle Income Countries (LMICs), making achieving UHC a priority as they limit access to essential health services. Social and Developmental Impact Bonds tailored for health interventions, also known as Health Impact Bonds, have emerged as innovative financing mechanisms to address these challenges. This scoping review aims to explore the implementation of Health Impact Bonds for financing UHC in LMICs and assess their alignment with key financial coverage objectives Methods: This scoping review followed Arksey and O'Malley's framework and complied with PRISMA-ScR guidelines. A systematic search was conducted in EconLit, PubMed, Scopus, Web of Science, and Ovid Embase for articles published between January 2010 and August 2024. Grey literature was also included and critically appraised by AACODS. The key components of the World Health Organization Health Financing Framework, which includes financial protection, equity and quality of care, were used to evaluate the Health Impact Bonds. Data extraction focused on target populations, interventions, evaluation methods and outcomes. Results: This scoping review identified 14 Health Impact Bonds implemented across various health sectors in LMICs, including maternal and child health, infectious diseases and water, sanitation and hygiene. The findings showed that Health Impact Bonds contribute to achieving the financial coverage goals outlined in the World Health Organization Health Financing Framework. These are reducing out-of-pocket expenses, improving healthcare utilisation relative to need and enhancing service quality. However, their overall effectiveness was limited by inadequate data infrastructure, institutional barriers and a priority on immediate results. Conclusion: By addressing gaps in healthcare access and financial protection, Health Impact Bonds show potential as innovative financing tools for achieving UHC in LMICs. However, long-term impact is dependent on improving data systems, encouraging stakeholder engagement and expanding their scope to address chronic health issues. These adaptations ensure Health Impact Bonds promote sustainable health system improvements and equity in LMICs.

Ind-426 Comparison of Pregnancy-related Out-of-pocket Expenditure in Bangladesh and Pakistan

PRESENTER: **Farjana Misu**
AUTHORS: Taslima Rahman, Dominic Gasbarro, Khurshid Alam

Abstract

Background

The burden of out-of-pocket (OOP) healthcare expenses for pregnancy-related conditions is a significant concern in resource-prone countries. Bangladesh and Pakistan, two historically connected countries with similar socioeconomic standings, rank among the highest globally in OOP share in total health expenditures. Excessive OOP costs pose financial barriers to maternal healthcare utilisation, leading to catastrophic health expenditures (CHE) and deepening poverty. Our study aims to compare pregnancy-related OOP expenditures between Bangladesh and Pakistan, examining key disparities in spending patterns and financial burden.

Methods

This study utilises data from the Bangladesh Household Income and Expenditure Survey (HIES) 2022 and published secondary evidence for Pakistan in the absence of primary data. For Bangladesh, we included all women of reproductive age who reported pregnancy-related health issues in the past 30 days or were hospitalised in the last 12 months. We estimated the share of OOP in total household expenditure on pregnancy-related healthcare, assessed CHE using budget share, actual, and normative food expenditure methods, and evaluated impoverishment effects. Descriptive and equity-based analyses were conducted to examine expenditure variations across socioeconomic groups.

Results

In Bangladesh, pregnancy-related OOP expenditures (USD 434.4) accounted for 50% of total household healthcare spending (USD 892.6). The share of OOP in total household expenditure was significantly higher for private healthcare facilities (USD 417.1) and among rural women (USD 384.8). Low-income households spent a greater proportion (two-thirds) of their total expenditure on pregnancy-related care. The CHE incidence was around 94.6%-80.9% among the lowest quintile households and 26.8%-66.5% among rural households under normative capacity-to-pay (CTP) method. Impoverishment rates were highest, with 31.7% low-income and 3.9% rural households falling into poverty due to OOP expenses. In Pakistan, OOP costs for pregnancy care were significantly higher in private facilities (USD 209.88-255.49) than in public facilities (USD 23.30-63.87).

Conclusion

Pregnancy-related OOP healthcare costs constitute a significant financial burden in Bangladesh and Pakistan, with higher expenses in private facilities. Low-income and rural families in Bangladesh face the greatest hardship, often leading to financial catastrophe and poverty. Strengthening public healthcare funding, expanding maternal health insurance, and regulating private sector pricing could reduce OOP costs and improve maternal healthcare equity.

Ind-1027 Financing Community Governance for Primary Care Facilities in Khyber Pakhtunkhwa, Pakistan: A Critical Analysis

PRESENTER: **Dr Shabana Haider**
AUTHORS: Mir Sana Ullah Khan, Nida Hameed, Mr. Sven Engels

Background: Direct facility financing (DFF) is increasingly recognized as critical for improving primary healthcare service delivery in resource-constrained settings. However, implementing DFF in contexts with limited institutional capacity presents significant challenges. In 2020, Pakistan’s Khyber Pakhtunkhwa (KP) province introduced Primary Care Management Committees (PCMCs), which combine elements of DFF with community governance. PCMCs, comprising facility staff and community representatives, were established across primary care facilities to manage supplementary funds alongside traditional district-managed budgets. This reform aimed to enhance facility responsiveness

to local needs by empowering communities to collaborate with facility managers in utilizing resources and improving infrastructure, supplies, and staffing, marking a significant shift from the province's historical reliance on centralized, input-based budgeting. **Research Question:** How do PCMCs receive, prioritize and utilize their resources, and what factors impact their ability to utilize these funds efficiently and effectively? **Approach:** The study employed a mixed-methods approach examining PCMC implementation from 2020-2023. We analyzed financial data of PCMCs at 439 facilities (out of 1,076) where complete and verifiable data was available across fiscal years 2021-22 and 2022-23. This was complemented by stakeholder interviews to understand fund flows, allocation patterns, and institutional arrangements. **Results:** We identified that PCMCs receive grants from the recurrent budget, development grants (through time-bound projects), and revenue from nominal service fee. While PCMCs showed promise in addressing immediate facility needs through infrastructure improvements (91% of expenditure), spending on service delivery inputs remained limited - equipment (3%), medicines (1%), and operational costs (5%). The analysis identified three key implementation challenges: fragmented oversight, weak data management systems, and heavy reliance on development rather than recurrent budgets, which may affect long-term sustainability. PCMCs expenditure analysis demonstrates how quickly infrastructure improvements can be made using PCMCs rather than traditional province wide infrastructure improvement projects which can be spread over several years. It also highlights the preference of using development funds instead of recurrent funds, identifying the need to ease access to recurrent funds, a longer term sustainable source. In addition, the lack of oversight and ownership of PCMCs by the Department of Health (DoH) has led to limited visibility of expenditure. **Conclusion**: PCMCs represent one of Pakistan's first systematic attempts to combine direct facility financing with community governance at the primary care level. The analysis shows that PCMCs are operational and capable of managing public funds to address local facility needs, though initial spending has primarily focused on infrastructure. To leverage PCMCs' full potential for improving service delivery, we recommend the KP Health Department establishes dedicated oversight mechanisms, improves data systems, and ensures sustainable funding through recurrent budgets. As the model matures, PCMCs can expand beyond infrastructure to address broader aspects of service delivery and quality improvement. The experience of PCMCs in Pakistan offers valuable insights for other low- and middle-income countries implementing DFF reforms in resource-constrained settings. **Key Words:** Direct Facility Financing, Community-based Health Governance, Pakistan, Primary Care Management Committees (PCMCs), Decentralized Financial Management, Community Involvement, Sustainability

Ind-797 Equity in Health Financing Towards Universal Health Coverage in China

PRESENTER: **Tiange Chen**

AUTHOR: Hongqiao Fu

Background: Equity in health financing is essential for achieving universal health coverage (UHC), particularly in low- and middle-income countries (LMICs). This study aims to examine the equity in both burdens and benefits of China's health financing system.

Methods: We used data from the Chinese Household Income Project (2007, 2013 and 2018), a nationally representative household survey. The progressivity of various financing sources and the overall financing system were measured using the Kakwani index (KI), and the distribution of benefits from social health insurance (SHI) was evaluated using the concentration index. We further conducted counterfactual policy scenario analyses to explore the impact of potential solutions to mitigate inequalities

Results: The overall health financing system remained mildly regressive, with KIs of -0.032 (95% CI: -0.044, -0.020) in 2007, -0.038 (95% CI: -0.053, -0.022) in 2013, and -0.036 (95% CI: -0.046, -0.025) in 2018. Among the financing sources, direct tax payments, SHI contributions by employees, and private health insurance premiums remained progressive, while indirect tax payments, SHI contributions by non-employed residents, and out-of-pocket payments were regressive. In addition, the distribution of benefits from SHI did not align with healthcare needs. The wealthiest 20% of households bore only 11.8% of the health burden but received 52.9% of the benefits in 2007 and this inequity in SHI benefit distribution persisted in 2018.

Conclusion: Lower-income households bore disproportionately greater health financing burdens relative to ability to pay, and received fewer SHI benefits relative to health needs. To address these inequities, China should reform the flat-rate contribution mechanism, set out-of-pocket payment caps for households, and reduce disparities in benefit packages across different SHI schemes.

Ind-1344 Strategic Purchasing for Quality Improvement: Evaluating Quality of Care and Client Satisfaction in Myanmar's Sun Private Clinics

PRESENTER: **Han Win Htat**

Background: Myanmar faces significant healthcare challenges, with many individuals accessing services through the private sector and paying out-of-pocket, leading to financial burdens and underutilization of essential health services. To support Myanmar's universal health coverage goals, Sun Community Health (SCH) contracted with 10 Sun General Practitioners (GP) clinics for one-year period in 2023 to provide a comprehensive package of primary care services. To enhance service delivery and ensure high-quality care, SCH conducted quarterly assessments and an end-of-project evaluation focusing on client satisfaction, quality of care, and implementation challenges. **Aim:** This study aimed to evaluate the quality of care and client satisfaction at SCH-contracted clinics, identify challenges and opportunities in implementing strategic purchasing for healthcare services, and inform future initiatives to improve service delivery and achieve universal health coverage in Myanmar. **Methods:** A mixed-methods approach was employed, combining quantitative assessments and qualitative interviews. Quarterly client satisfaction surveys were conducted using the Lot Quality Assurance Sampling (LQAS) method. In each of the 10 clinics, 19 clients were randomly selected per round (except one clinic in Q2 with 17 clients due to security challenges), totaling 568 client surveys across Q2, Q3, and Q4 of 2023. Concurrently, quarterly quality assurance assessments to all 10 clinics were conducted, aligned with the Royal Australian College of General Practitioners (RACGP) Standards (5th edition). Qualitative interviews were conducted at the end of the project with 10 medical doctors, 10 clinic assistants, and 30 clients to gather insights on recruitment, service coverage, financial systems, and client satisfaction. Data were analyzed to identify strengths, gaps, and actionable recommendations. **Results:** Quantitative assessments revealed consistently high client satisfaction across Q2, Q3, and Q4 of 2023, with clinics achieving 100% satisfaction increasing from three in Q2 to five in both Q3 and Q4. Areas needing improvement included communication about drug side effects and information on free or out-of-pocket services. Quality

assurance assessments showed all clinics meeting the 90% compliance threshold by Q4, with strengths in clinical management and adherence to guidelines. Gaps persisted in patient education and emergency preparedness. Qualitative interviews revealed challenges such as brief recruitment periods hindering full integration, gaps in the benefit package (e.g., exclusion of skin infection treatments), and delays in payment systems, especially for maternal health investigations. Clients reported improved financial access and positive maternal health outcomes, emphasizing strong provider-client relationships and the need for clear communication about available services and potential costs. **Conclusions:** The findings indicate high levels of client satisfaction and quality care across SCH clinics, with significant improvements over time. Challenges remain in enhancing patient education, emergency preparedness, and financial systems. Strategic purchasing has transformative potential for addressing healthcare challenges in Myanmar. Future programs should consider extended recruitment periods, regular benefit package reviews, streamlined financial processes, and enhanced client engagement to sustain impact and adapt to evolving health needs. Ongoing assessments and targeted interventions are crucial for maintaining and improving service quality on Myanmar's path toward universal health coverage.

Ind-79 Financing Landscape for Key Populations HIV/AIDS in Uganda: March 2022

PRESENTER: **Arnold Taremwa**
AUTHORS: FELIX RUTARO, CHARLOTTE MUHEKI

Background: Key Populations (KPs) such as sex workers and people who inject drugs face heightened vulnerability to HIV/AIDS due to social, legal, and structural barriers. Despite their elevated risk, HIV funding in Uganda for KPs remains disproportionately low, representing less than 1% of total HIV prevention funds in recent years. This funding gap jeopardizes Uganda's progress in controlling HIV/AIDS, particularly among marginalized groups. This research examines the funding landscape for KPs in Uganda and identifies strategic priorities to enhance HIV prevention, care, and treatment services. **Aim:** To assess the current HIV/AIDS funding allocations for KPs in Uganda and propose recommendations to address funding gaps and improve service delivery for these vulnerable groups. **Methods:** This research employs a mixed-methods approach. Quantitative data from Uganda's National AIDS Spending Assessment (NASA) was analysed to understand trends in resource allocation between 2016-2019. Qualitative data was gathered from policy documents, interviews with stakeholders in the health sector, and reports from donor agencies. The analysis focuses on the distribution of funding between government, donor agencies, and private contributions, highlighting disparities in resource allocation to KPs. **Results:** Between 2016 and 2019, Uganda's HIV response was primarily funded by international donors, contributing over 80% of resources. However, only a marginal portion of these resources were allocated to KPs. In 2018/19, KPs received just 0.3% of total HIV prevention funding, with most of it directed toward sex workers (95% of KP-specific funds). Other KPs, including people who inject drugs and transgender individuals, shared the remaining 5%. The analysis revealed a significant funding gap in addressing the specific needs of these groups, despite them being disproportionately affected by the HIV epidemic. For instance, the HIV prevalence among sex workers was estimated at 31.3%, far exceeding the national average of 6.2%. Similarly, people who inject drugs and other KPs faced higher risks of infection but remained largely underserved. Moreover, the report found that donor contributions, while substantial, are declining, with a predicted drop in future allocations due to shifting global priorities. The government's domestic contribution to KP-focused HIV programs remained below 1%, further exacerbating the resource gap. This inadequate funding allocation raises serious sustainability concerns, as over-reliance on donor funding leaves the HIV response for KPs vulnerable to fluctuations in international aid. **Conclusions and Policy Implications:** Sustainable HIV/AIDS control in Uganda requires re-prioritization of KP funding in national HIV responses. The study advocates for increased domestic funding, strategic donor engagement, and the development of KP-led health initiatives. Without addressing these funding disparities, Uganda risks stagnating in its fight against HIV, particularly among high-risk populations. The findings support calls for policy changes aimed at equitable resource distribution and the removal of legal barriers that hinder access to care for KPs.

Ind-2806 Assessing the Effectiveness of Social Health Insurance in Reducing out-of-Pocket Health Expenditure in Mixed Health Systems: The Philippine Case

PRESENTER: **Shem Pava**, De La Salle University - Carlos L. Tiu School of Economics
AUTHORS: Bernardo II Cielo, Alellie Sobrevinas, Arlene Inocencio, Emi Obina, Dariafel Faith Mararac, Nathaniel Bangalan

The Universal Health Care (UHC) Act of 2019 positioned the National Health Insurance Program (NHIP) as a central mechanism for achieving UHC in the Philippines, transitioning membership from contribution-based eligibility to citizenship. Despite this shift, some Filipinos remain unregistered, in part, due to distrust in the NHIP's ability to reduce out-of-pocket (OOP) health expenditures relative to the premiums and tax subsidies it collects. This distrust has been fueled by public controversies, including ineffective price negotiations under prospective payment mechanisms, pandemic-era administrative relief through advanced payments, and recent challenges in maintaining actuarial fairness. Additionally, the diminishing share of NHIP's social health insurance (SHI) payments in national health expenditures and inadequate coverage for catastrophic cases have intensified calls to reassess the program's value. This study evaluates the effectiveness of the NHIP in reducing OOP health expenditures for hospital admissions, focusing on inpatient care, given its limited coverage for outpatient services. Using data from the 2022 National Demographic and Health Survey, a Tobit regression model was employed to assess the impact of SHI payments on OOP spending, controlling for cost drivers and alternative payment sources, including private insurance, government subsidies, and inter-familial transfers, among others. Furthermore, the study analyzed OOP reductions across wealth quintiles to determine the NHIP's capacity for cross-subsidization and equitable cost coverage. Findings indicate that NHIP participation significantly reduces OOP expenditures for inpatient care, with insured individuals paying an average of Php 14,110.95 (USD 253.20) less for premium-based members and Php 15,286.33 (USD 274.29) less for state-subsidized members compared to the uninsured. However, coverage remains insufficient in offsetting OOP relative to other payers, with inpatient cost drivers linked to length of hospital stay and private hospital utilization. Across wealth quintiles, the lowest-income NHIP contributors exhibit higher OOP spending than their uninsured counterparts, suggesting potential gaps in complementary financing and confirming the assumed effect of insurance-induced demand. The results underscore NHIP's positive, though limited, role in reducing OOP expenditures for hospitalizations. Strengthening the program is imperative to improve efficiency in payment mechanisms. Key recommendations include addressing the widening public-private provider gap, as private hospitalizations are a major cost driver. Cost containment strategies, such as expanding public sector investments to enhance competition and leveraging NHIP's market power to negotiate

prices, are essential. Additionally, increasing NHIP population coverage and expanding the proportion of care costs covered by SHI can enhance the program's ability to provide financial risk protection towards achieving UHC.

abs-os167 Indonesia's National Health Insurance and Maternal Health Outcomes

PRESENTER: **Ms. Dina Anjayani**
AUTHORS: Mr. Praptadi Agung Sadyoga, Mr. Antokalina Sari Verdiana, Ms. Esterlita Putri Pamungkasari

Background: Sustainable Development Goal (SDG) 3.8 aims to ensure universal access to quality healthcare. Indonesia introduced the National Health Insurance (JKN) in 2014 to support this goal. By 2024, JKN covered 98% of Indonesia's population, including East Nusa Tenggara (NTT) Province, where the poverty rate is 19.48%. JKN is expected to improve healthcare utilization, particularly for maternity care. This study examines the impact of JKN on maternity care utilization in NTT Province before and after its implementation.

Methodology: This study analyzed data from the 2013 and 2023 National Socioeconomic Surveys (Susenas) focused on mothers who gave birth in healthcare facilities. A total of 3,936 women were surveyed in 2013 and 1,725 in 2023. The Andersen Behavioral Model was used to explore factors influencing JKN enrollment, considering predisposing (age, education, marital status, employment), enabling (wealth index, residence, internet access), and need (health service access) factors. Logistic regression identified variables related to health insurance ownership for each year. The sample was divided into JKN holders (treatment) and non-holders (control). Propensity Score Matching (PSM) and Difference-in-Differences (DID) were applied to measure JKN's effect on maternity care utilization across the two years. Concentration Index (CI) using Lorenz curves assessed disparities in healthcare access and facility-based childbirth in 2013 and 2023.

Results: In 2013, key determinants of JKN ownership were healthcare access and wealth index (Q4 and Q5), while in 2023, education (basic and secondary) and healthcare access were the main factors. PSM for 2013 showed an Average Treatment Effect on the Treated (ATT) of 0.0207, while for 2023, it was 0.0683. Post-matching, variables were balanced, reducing potential bias. DID analysis indicated a 4.76% treatment effect for JKN holders, suggesting a stronger impact of JKN on facility-based childbirth. CI for healthcare access among JKN holders was 0.074 in 2013, dropping to 0.057 in 2023. For facility-based childbirth, CI decreased from 0.163 in 2013 to 0.043 in 2023. These findings show that JKN has helped reduce inequalities in healthcare access and facility-based childbirth in NTT Province.

Conclusion: JKN has positively influenced maternity care utilization in healthcare facilities, particularly in NTT. Policy recommendations include increased governmental involvement and public education to encourage facility-based childbirth, maximizing JKN's benefits for maternal health. Additional policy measures are needed to address out-of-pocket costs and unmet needs for facility-based childbirth services, especially in NTT's remote areas.

10:30 AM –12:00 PM MONDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Bandung

Food Insecutiy, Community Health, and Obesity

MODERATOR: **Rocio Garcia-Diaz**, Tecnológico de Monterrey

Ind-2188 Canada's Old Age Security Program: A Path to Alleviating Food Insecurity Among Seniors

PRESENTER: **Mohammad Hajizadeh**
AUTHORS: Catherine L. Mah, Mevlude Akbulut?Yuksel, Thiago Ferro

The Old Age Security (OAS) program, comprising the universal OAS pension and the Guaranteed Income Supplement (GIS) for low-income seniors, serves as the foundational pillar of Canada's retirement income system, effectively providing a guaranteed annual income for the senior population. We investigate the impact of OAS income on food insecurity, a critical issue with significant implications for physical and mental health, among primary beneficiaries of the program, low-income seniors. Using a sharp regression discontinuity design (RDD), we analyze pooled data from the 2015–2019 Canadian Community Health Survey (CCHS), focusing on seniors with annual incomes below $26,000 who become eligible for GIS and OAS benefits at age 65, resulting in a significant increase in their income. To assess the causal impact of program participation, we measure the likelihood of food insecurity using the Adult Scale from the Household Food Security Survey Module (HFSSM), a validated tool that identifies food insecurity through questions on running out of food, skipping meals, and experiencing hunger due to financial constraints. We find that receiving OAS at age 65 reduces food insecurity in Canada by 7-8%, with the impact varying by sex and province of residence. Significant reductions in food insecurity were observed among both sexes in Ontario, and females in Nova Scotia and Quebec, while other provinces showed minimal or no improvement. Our study suggests that OAS financial support is an effective policy tool against food insecurity among low-income seniors, potentially explaining why food insecurity is lower in this group compared to the general population. The observed heterogeneity in the estimated effects of the program across Canadian province indicates that provincial factors also contribute to food insecurity levels. **Keywords:** Old Age Security program, Seniors, Regression discontinuity design, Food insecurity, Canada

Ind-1304 Nutrition-Sensitive Cash Transfers and Lean Season Food Insecurity

PRESENTER: **Dan Maggio**
AUTHORS: Aulo Gelli, Anissa Collishaw

Significance/Background Across sub-Saharan Africa, poor rural households experience intra-annual cycles of hunger. During these "lean

seasons" – the period between planting and harvest when crops are in the field but not ready for consumption – households deplete their grain stores, food prices rise, and income-generating opportunities decline, leading to widespread food insecurity. These spells of severe food insecurity not only harm households' ability to pull themselves out of poverty but may also co-occur with periods of crucial importance to children's growth, causing stunting and poor cognitive development. **Research Question** We study the degree to which social protection programs can protect against these lean season shocks. Specifically, we ask if unconditional cash transfers combine with complementary nutrition behavior change programming can protect household food security during the lean season. **Methods** We study a cluster randomized controlled trial designed to evaluate the effectiveness of augmenting the Government of Malawi's (GOM) early childhood nutrition and development approach with more intensive social behavior change communication and unconditional cash transfers. Our trial randomly assigns communities to one of four trial arms: 1. Control – The GOM's Standard of Care (SOC) 1. Social behavior change (SBC) – A bundle of SBC interventions to augment the SOC. 1. SBC + Low Cash – The SBC intervention + an MWK 17,204 monthly cash transfer 1. SBC + High Cash – The SBC intervention + an MWK 43,516 monthly cash transfer We study the effectiveness of this package at maintaining food security during Malawi's severe 2022-2023 lean season. **Key Findings** We find that the SBC + High Cash Arm was particularly effective. Among households who received this package, we observe 16 percent higher food consumption and 14 percent lower food insecurity. In contrast with control households, who experiences sharp deterioration of dietary quality during the lean season and consumed 385 fewer calories per person per day relative to our baseline survey, these households consumed 226 more calories. They also had fewer micronutrient inadequacies and consumed 31 percent more thiamin, 11 percent more niacin and 15 percent more. These findings can be largely explained by greater agricultural yields and food storage that insulated these households against the sharp price spikes of staple grains in the lean season. In our other treatment arms, we see improvements in dietary diversity but observe no evidence of a protective effect regarding dietary quantity. **Knowledge Contribution** Our results present a clear tradeoff between scale and treatment intensity when looking to reduce seasonal food insecurity. We show that this is likely because the income elasticity of demand for food is quite low, while several of the substitution elasticities are much higher; meaning that households may prioritize diverse diets over adequate diets, even in the context of a large economy-wide negative shock. These findings also the highlight the importance of transfer timing, as the "high cash" households did not improve their food consumption through purchases, but rather by using the cash to purchase agricultural inputs and sure-up their food stocks for the lean season.

Ind-1807 Impatience and Present Bias do not Predict Weight Loss in Obesity: Evidence from Lab-in-Field and Nationally Representative Data

PRESENTER: **STEFANIE SCHURER**
AUTHORS: Ian Caterson, Nicholas Fuller, Xueting Wang, Agnieszka Tymula

This paper demonstrates that impatience and present bias, the key building blocks of behavioral economics models of choice, do not predict success in attempts at reducing body fat and BMI for people with obesity. Behavioral economic theory attributes the inability to lose weight to impatience and present bias, assuming they lead to excessive food consumption and inadequate exercise. We use data from a large-scale lab-in-field study that tracks 293 participants with obesity who attempted to improve their health as part of a 12-month randomized controlled trial conducted in a clinical setting. We find no statistically and economically significant relationship between impatience or present bias and body fat/BMI loss within a 6 and 12 months window. We rule out that our results are driven by measurement issues or internal validity concerns. First, we replicate our key finding in nationally representative survey data of 6,118 adults with obesity, regardless of their weight loss intentions. Second, we find that impatience significantly predicts the risk of drop-out from the trial before completion in an economically meaningful way. Increasing participants' impatience by 1 standard deviation above the mean implies that an extra 1 in 12 participants would fail to complete the trial ($p<0.05$). Our results suggest that inability to complete medically advised treatments is a behavioral condition, but obesity itself is not. Treatments that focus on correcting impatience or self-control alone may not be the right approach for weight loss in clinically relevant populations.

Ind-2215 The Impact of Volume Based Promotion Removal on the Sales of Soft Drinks and Confectionery Products

PRESENTER: **Viktorija Kesaite**
AUTHORS: Thijs van Rens, Jean Adams, Martin White, Oliver Mytton

Background: Studies have shown that in-store price promotions disproportionately target the sale of less healthy foods. Removing such promotions may reduce these purchases. In this study, we evaluated the impact of removing multi-buy promotions on the purchases of soft drinks and confectionery products at one major UK supermarket in April 2016, relative to other major UK supermarkets which hadn't implemented this intervention. We had three main objectives: i) to assess whether removing multi-buy promotions led to a shift toward other types of price promotions among households in the intervention group compared to those shopping at other UK supermarkets; ii) to examine whether the intervention affected the expenditure and quantity of soft drinks and confectionery products purchased; and iii) to explore whether the effects varied by educational level and household size.

Data: We used household purchase data on soft drinks and confectionery products from Kantar Worldpanel's UK consumer panel, which includes approximately 30,000 households. Our dependent variables were log transformed purchases, analysed separately for expenditure and quantity, and the main variable of interest was the interaction variable between a post-treatment dummy for April 2016 and the proportion of spending in the intervention group. For the purposes of this analyses we used data for the years 2014 -2018.

Methods: To evaluate the effect of removing multi-buy promotions in the intervention group on household supermarket purchases, relative to purchases for households who shop at other major UK supermarkets, we used a difference-in-difference methodology, which we estimated using two-way fixed-effects. Our empirical strategy exploits the exogenous variation across supermarkets on the impact of multi-buy promotion removal on sales outcomes in the intervention group.

Results: We found a statistically significant decrease in both expenditure and unit sales of soft drinks and confectionery products following the removal of multi-buy promotions. Soft drink expenditure decreased by 0.4725 (95% CI: -0.5319 to -0.4131) and unit sales by 0.2509 (95% CI:

-0.3097 to -0.1921). For confectionery products, expenditure fell by 0.2108 (95% CI: -0.2829 to -0.1387) and unit sales by 0.1803 (95% CI: -0.2427 to -0.1178). While purchases on other price promotions increased, total promotional purchases of these products decreased overall. Sub-group analyses indicate that this effect was more pronounced among households with children and those where the highest education level was a degree or higher.

Conclusions: Our analysis showed that removing multi-buy promotions led to a statistically significant shift toward other price promotions. However, this substitution did not fully offset the impact of the intervention, resulting in an overall decline in promotional sales of soft drinks and confectionery products. This suggests that removing multi-buy promotions on unhealthy products in-store might help to reduce the demand for these products.

10:30 AM –12:00 PM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Medan

Economic Evaluation of Non-communicable Disease Interventions

MODERATOR: **Fernando Postali**,

Ind-207 Optimising Radiotherapy Access: A Cost-Effectiveness Analysis of Hypofractionated vs. Conventional Radiotherapy for Breast and Prostate Cancers

PRESENTER: **Nayyereh Ayati**
AUTHORS: Jing Jing Li, Andrew Scott, May Abdel-Wahab

Introduction:

Global access to radiotherapy remains critically limited, particularly in low- and middle- income countries, where patients often face limited or delayed treatment due to resource constraints. Hypofractionated radiotherapy (HRT), which delivers shorter treatment courses with comparable efficacy compared to conventional radiotherapy (CRT) presents a promising option for optimising resource use. However, its potential to improve accessibility is yet to be fully explored. This study addresses this knowledge gap by estimating the global demand for radiotherapy for two high burden cancers -breast and prostate -and assessing the potential cost savings and resource efficiencies achievable with HRT over a one-year period from the perspective of national healthcare systems.

Method:

We conducted a comprehensive review of the comparative efficacy and safety of HRT versus CRT to guide our economic evaluation. Using the unique Global Cancer Observatory (GLOBOCAN) 2022 database, we estimated the global incidence of breast and prostate cancers in 2024, providing a robust foundation for estimating global radiotherapy demand, adjusted for country-specific population growth. Optimal radiotherapy rates and fraction requirements for CRT and HRT were determined based on practice guidelines and validated with real-world data from 207 radiotherapy centres across 55 countries across all income levels. Costs—including equipment, staffing, and infrastructure—were estimated using income-specific data from the International Atomic Energy Agency (IAEA) activity-based costing model. Cost savings were estimated by comparing the reduced number of fraction requirements in HRT to those of CRT, with freed-up capacity assumed to allow treatment of additional patients, thereby expanding global access to radiotherapy.

Results:

This analysis included 174 countries classified as 15% low-income, 27% lower-middle-income, 26% upper-middle-income, and 32% high-income split. In 2024, the estimated radiotherapy demand encompassed 895,249 prostate cancer and 2,101,986 breast cancer patients. CRT would require 33.1 million fractions for prostate and 52.5 million for breast cancer, while HRT would reduce these needs to 17.9 million and 31.1 million fractions, respectively. These 36.2 million reductions in fractions could free capacity to treat an additional 2.2 million patients. Cost-savings from substituting HRT over CRT were estimated at $5.5 billion, with savings divided between prostate ($2.6 billion) and breast cancer ($2.9 billion). High-income countries achieved the largest savings in absolute terms especially in labour costs, but low-income countries showed substantial relative gains when adjusted for GDP per capita and population size, especially in equipment and infrastructure costs. Sensitivity analysis confirmed a linear relationship between cost-savings and the rate of HRT substitution, with even partial adoption yielding significant financial benefits.

Conclusion:

This study demonstrated significant cost-savings with HRT over CRT, particularly for prostate and breast cancers given their high global incidence. Leveraging global cancer data through GLOBOCAN allowed for precise, region-specific estimates of radiotherapy demand, underscoring its utility in health resource allocation worldwide. The findings support HRT as a cost-effective strategy to expand radiotherapy access, address resource limitations, and improve patient care, especially in low- and middle-income countries. These results suggest potential policy shifts, such as reimbursement models that encourage HRT use, to drive sustainable and efficient radiotherapy expansion globally.

Ind-289 Cost-Effectiveness of IoT-Based Management of Home NPPV in COPD Patients With Hypercapnic Chronic Respiratory Failure: Trial Based Economic Evaluation

PRESENTER: **Ruihua Feng**
AUTHORS: Hui Liu, Jiu Cheng, Yuanlin Song, Yueying Cui, Xi Wang, Yinghao Lv

Background The management of chronic obstructive pulmonary disease (COPD) presents a significant burden to healthcare systems across the world. For COPD patients with hypercapnic chronic respiratory failure, home noninvasive positive pressure ventilation (NPPV) is an established treatment option associated with significant benefits, but challenges still remain in ensuring treatment effectiveness. This study aimed to assess the cost-effectiveness of Internet of Things (IoT)-based management versus standard management of home NPPV in COPD patients with hypercapnic chronic respiratory failure. **Methods** A Markov decision analytic model was developed to simulate real-world COPD progression and predict health outcomes and costs associated with IoT-based and standard management of home NPPV. Efficacy and cost inputs were primarily sourced from a published multicenter, prospective, randomized controlled trial and supplemented by official Chinese databases where necessary. The discounted lifetime cost per quality-adjusted life-year (QALY) gained was calculated from Chinese healthcare payer perspective and sensitivity analyses were conducted to test the robustness of model results across different assumptions. **Results** Compared to standard NPPV, IoT-based NPPV increased costs by ¥3,607.26 and improved QALYs by 0.24 per person across the lifetime horizon, resulting in an incremental cost-effectiveness ratio of ¥15,030.25 per QALY with a 93.6% probability of being cost-effective at the given willingness-to-pay threshold. Base case results were also robust to multiple one-way sensitivity analyses, with the main drivers being hospitalization costs of standard and IoT-based NPPV groups during the period of serious exacerbation. **Conclusions** IoT-based NPPV was cost-effective compared to standard NPPV for COPD patients with hypercapnic chronic respiratory failure. **Keywords:** Chronic obstructive pulmonary disease; Noninvasive positive pressure ventilation; Hypercapnia respiratory failure; Internet of things; Telemedicine; Cost-effectiveness analysis; Economic evaluation.

Ind-562 Estimating the Healthcare Costs of *In Situ* and Thin Invasive Melanoma Overdiagnosis in Australia

PRESENTER: **Daniel Lindsay**
AUTHORS: Thanya Pathirana, Louisa Collins, Catherine Olsen, Katy Bell, David Whiteman

Background: International research suggests that a high proportion of melanoma *in situ* may be overdiagnosed, potentially contributing to overtreatment, patient harm and inflated costs for individuals and healthcare systems. However, Australia-wide estimates of the magnitude of melanoma overdiagnosis are potentially outdated and there has been no estimation of the cost to the healthcare system. We aimed to estimate the magnitude and subsequent cost to the Australian healthcare system of overdiagnosed *in situ* and thin invasive melanomas in Australia.

Methods: Using the competing mortality and adjusted for multiple primary methods to calculate lifetime melanoma risk, we used routinely collected national-level data to estimate overdiagnosed melanoma *in situ* and thin invasive melanomas (stage IA) in Australia in 2017 and 2021, separately for men and women. We multiplied the number of overdiagnosed melanomas by the estimated annual cost of a melanoma *in situ* or thin invasive melanoma, to quantify the financial burden of melanoma overdiagnosis to the Australian healthcare system in the year following diagnosis.

Results: We estimated that 67–70% of melanoma *in situ* were overdiagnosed in 2017, rising to 71–76% in 2021, contributing to between 19 829 (95%CI: 19 553 – 20 105) and 20 811 (95%CI: 20 528 – 21 094) cases of overdiagnosed melanoma *in situ*. In 2021, the estimated costs in Australia for melanoma overdiagnosis ranged between $17.7 million Australian dollars (AUD; 95%CI: AUD$17.4 – AUD$17.9 million) and AUD$18.6 million (95%CI AUD$18.3 – AUD$18.8 million). We estimated that 22–29% of thin invasive melanomas were overdiagnosed in 2017, rising to 28–34% in 2021, contributing to between 2831 (95%CI: 2726 – 2935) and 3168 (95%CI: 3058–3279) overdiagnosed thin invasive melanomas in Australia. In 2021, the estimated costs from thin invasive melanoma overdiagnoses ranged between AUD$2.5 million (95%CI: AUD$2.4 – AUD$2.6 million) and AUD$2.8 million (95%CI AUD$2.7 – AUD$2.9 million). The total cost of overdiagnosed melanomas to the Australian healthcare system was approximately AUD$21.6 million in 2021.

Conclusions: Melanoma overdiagnosis is a growing clinical and public health problem in Australia, producing significant economic costs in the year following overdiagnosis. Limiting melanoma overdiagnosis may prevent unnecessary healthcare resource use and improve financial sustainability within the Australian healthcare system. Redirecting costs incurred for overdiagnosis to fund skin cancer prevention programmes aimed at reducing incidence might be a more cost-effective use of government resources.

Ind-621 Healthcare Resource Utilisation and Cost of Coronary Heart Disease Care Pathway Across the Continuum in Australia Using Linked Administrative Data

PRESENTER: **Sangita Shakya**
AUTHORS: Richard Varhol, James Boyd, Crystal Lee, Bernard Asiamah-Asare, Kevin Chai, Lan Gao, Suzanne Robinson, Sean Randall

Background:

Coronary heart disease (CHD) is the leading cause of morbidity and mortality, imposing a substantial burden on healthcare systems. The coexistence of type 2 diabetes mellitus (T2DM) further amplifies this burden. As the socio-economic impact of CHD continues to rise, a clearer understanding of care pathways and their associations with health outcomes and costs is critical for informed healthcare planning and policy.

Objective:

To examine integrated care pathways for individuals with CHD and T2DM, identify healthcare interactions associated with rehospitalisation and mortality, and estimate incremental healthcare cost for CHD patients with and without T2DM.

Methods:

We used linked administrative datasets for CHD patients (ICD10-AM code block I20-I25) from MedicineInsight general practices (GP) and secondary care data (emergency, hospital, and mortality) in Western Australia (n=694,004) recorded between 2010-2023. First, CHD cases presented at emergency departments (ED; index event) were matched with hospital and GP records. Among CHD patients with T2DM (n=2,085), we analysed pre-and post-CHD care pathways and their associations with rehospitalisation and mortality using descriptive statistics, Cox regression and discrete-time generalised linear model (GLM) with $\log_2$-transformed GP visits counts in StataSE 18. Second, we conducted an incremental cost analysis over a 3-year post CHD period comparing CHD patients with T2DM (n=1,006) to propensity score matched CHD-only controls (n=1006), drawn from a larger population (n=3,240). Direct healthcare costs (GP visits, ED presentations, hospital admissions, prescribed medications, and pathology tests) were estimated for 2024 from a government perspective. All models were adjusted for age group, sex, remoteness, and socio-economic status (comorbidities included only in pathway analysis).

Results:

Each doubling of post-CHD GP visits was associated with reduced odds of recurrent rehospitalisation (OR=0.94; 95% Confidence Interval (CI) 0.92-0.97; p<0.001) and lowered mortality risk (HR=0.87, 95% CI: 0.84-0.90; p<0.0001). Conversely, a doubling of pre-CHD GP visit was associated with increased odds of recurrent rehospitalisation (OR=1.04, 95% CI: 1.01-1.06; p=0.005) and mortality (HR= 1.09, 95% CI: 1.05-1.11; p<0.0001). Older age (≥ 60 years), remote residence, comorbid heart failure or chronic kidney disease were significantly associated with elevated mortality. Overall, 73.7% (95% CI: 71.8-75.6%) of patients received at least one of the guideline-recommended medication, 34% (95% CI; 31.9%, 36.4%) were prescribed metformin, often alongside Insulin, or DPP4 inhibitors. Patients with CHD and T2DM incurred an additional AUD 10,213 than patients only having CHD in 3-year post CHD follow-up largely due to hospitalisation. Cost peaked in the first year post-CHD in both groups of patients.

Conclusion:

Post-CHD GP engagement was linked to improved survival and reduced risk of rehospitalisation, suggesting its potential value in improving outcomes and containing long-term costs. In contrast, frequent GP visits before the index event may reflect underlying health complexity and elevated risk. The higher cost burden in CHD with T2DM patients, largely driven by hospitalisations, underscores the need for integrated, cost-effective care models and improved uptake of guideline recommended therapies. Targeted interventions for older adults, remote population, and those with multimorbidity may help reduce avoidable system burden and improve health equity.

Ind-1143 Cost-Utility Analysis of Radiofrequency Ablation (RFA) Among Facet Joint Chronic low Back Pain Patients in Thailand

PRESENTER: **Manit Sittimart**

Background: Chronic low back pain (CLBP) is among the top ten leading worldwide causes of years lost to disability. Radiofrequency ablation (RFA) is widely recommended as a secondary treatment for facet joint-related chronic low back pain (CLBP). However, evidence on its cost-effectiveness in Thailand remains insufficient to inform reimbursement decisions. **Aim:** This study aimed to evaluate the cost-effectiveness of conventional RFA compared to conservative treatment for facet joint originated CLBP patients over 16-month and 28-month time horizons in Thailand. **Method:** A cost-utility analysis was performed using a Markov model and guided by the Thai health technology assessment (HTA) guidelines. The model used a monthly cycle length and adopted a societal perspective. RFA, including a diagnostic medial branch block (MBB), was compared to conservative treatment (medications, physical therapies, and integrative treatments). Data were collected from both primary and secondary sources. Clinical data were obtained from multiple randomised controlled trials, while medical cost data—including doctor fees—were extracted from claim databases of three university hospitals in Bangkok. Direct non-medical costs were based on patient interviews (n=64; RFA group: 31, conservative group: 33). Utility values were derived using the EQ-5D-5L (Thai version) questionnaire, with health states classified by a numeric rating scale (NRS ≥4 for pain state). THB values were converted to international dollars (Intl $) using a 2022 purchasing power parity rate (THB 11.7236 = 1 Intl $). The results were shown as incremental cost-effectiveness ratios (ICER) in Intl $ per quality-adjusted life year (QALY), with a willingness-to-pay (WTP) threshold of approximately I$13,652 per QALY gained. Sensitivity analyses, including one-way and probabilistic analyses, were conducted to explore influential parameters and uncertainty. A threshold analysis was performed to identify the RFA pricing at which it could become cost-effective. **Results:** The probabilistic ICER for RFA was estimated at I$99,267/QALY for the 16-month horizon and I$52,380/QALY for the 28-month horizon, both exceeding the WTP threshold. One-way sensitivity analysis showed that the ICER was most affected by variations in utility parameters, RFA pricing, opportunity costs, and the direct medical costs associated with CLBP. At the current WTP threshold, RFA pricing would need to decrease fourfold—from I$4,897 to I$1,158 for the 16-month horizon and to I$1,779 for the 28-month horizon—for RFA to have a 50% chance of being cost-effective. **Conclusion:** This study is the first economic evaluation of RFA for CLBP in Asia. At its current price, RFA is not considered cost-effective in Thailand. However, it may offer potential benefits, including reduced need for unnecessary lumbar spine surgeries. Price negotiation is recommended to make the intervention more cost-effective before it is included in Thailand's benefit package.

Ind-1384 Lifetime Direct Costs of Managing Cervical Cancer in South Africa: Medical Schemes Perspective

PRESENTER: **Evelyn Thsehla**

Background

South Africa bears 2.3% of the global burden of cervical cancer incidences and 1.8% of the estimated global death. Cervical cancer is a leading cause of cancer mortality in South African women. Approximately 5 870 women died of cervical cancer in 2018. The lifetime cost of managing cervical cancer in medical schemes is unknown. This study estimates the lifetime direct medical costs of managing cervical cancer using the

prescribed minimum benefits (PMB) funding guidelines in medical schemes in South Africa.

Methods

A Markov model was used to estimate the long-term costs of managing cervical cancer as a PMB in medical schemes. Based on the number of girls below the age of 9 in medical schemes, a hypothetical cohort of 150 000 girls was followed over a 55 –year time horizon. The PMB funding guidelines were used to identify services for managing cervical cancer. Unit costs were sourced from medical schemes and the Council for Medical Schemes. Epidemiological data and transition probabilities were sourced from literature. Total costs were estimated over the follow up period from the medical schemes perspective and expressed in South African rands.

Results

A total of R5.3 billion (no discount) was estimated for managing cervical cancer cases after following the cohort for 55 years. This amount translates to R899 million when a discount rate of 5% is used. When analysed by different groups, R187 million (discount) was estimated for managing cervical cancer in the age group 25 to 34 as compared to R537 million (discount) in the age group between 35 and 55. Approximately R233 billion, R170 million, R117 million and R378 million was estimated for managing the cohort in stage I, stage II, stage III and stage IV, respectively.

Conclusion

The lifetime costs of cervical in medical schemes are substantial. Effective interventions such as screening and vaccination should be encouraged to reduce new infections and lifetime costs in the covered population.

Ind-1478 Direct Medical Costs of Nasopharyngeal Carcinoma in Indonesia: A Healthcare Payer Perspective

PRESENTER: **Royasia Viki Ramadani**
AUTHORS: Cosphiadi Irawan, Erna Kristin, Susanna Hilda Hutajulu, Yussy Afriani Dewi, Gregorius Ben Prajogi, Lucia Rizka Andalucia, Donni Hendrawan, Sudi Indrajaya, See-Hwee Yeo, Shikha Dhawan, Junice Ng

Background: Nasopharyngeal carcinoma (NPC) is a common and deadly cancer in Indonesia. The objective of this study is to estimate the direct medical hospital costs of NPC using the national health insurance (*Jaminan Kesehatan Nasional* [JKN]) database in Indonesia. **Methods:** The annual costs were estimated using a nationally representative sample of 1% of the JKN population, comprising 2.1 (2019) to 2.4 million (2022) JKN members, from 2019 to 2022. Patients newly diagnosed with NPC, who had at least two NPC-related visits and no prior cancer diagnosis in the year before, were included. Annual costs were calculated over one year (365 days) from the first visit associated with NPC. Costs captured under Case-Base Groups (CBGs) comprised hospitalization and specialist outpatient visits. Non-CBGs costs included radiotherapy, diagnostic procedures, and other costs such as prostheses. Chemotherapy costs were not available for analysis. Costs in Indonesian Rupiah (IDR) were inflated using the Consumer Price Index in 2022 and converted to United States dollars (USD) (1 USD = IDR 15,731). **Results:** Of the 590 NPC patients with records in JKN, 262 patients met the inclusion criteria. Around 29% of these patients did not receive any NPC-related treatment one year after diagnosis. The annual mean cost was USD 4644 per patient. CBGs accounted for 92% of the total mean cost, with inpatient and outpatient CBGs costing USD 2014 and USD 2278 per patient, respectively. Non-CBGs cost per patient was USD 353. The total direct medical hospital cost for all NPC patients in the JKN population was extrapolated to be USD 40.5 million per year. This comprised 14% of the JKN cancer expenditure. **Conclusions:** NPC imposes a significant economic burden on Indonesia's health system. To contain health expenditures, specific policies are needed to improve cancer prevention and early diagnosis, as well as to efficiently allocate healthcare resources. **Editorial acknowledgement:** This study was sponsored by BeOne Medicines, Ltd. Editorial support, under the direction of the authors, was provided by Envision Pharma Inc., and was funded by BeOne Medicines.

Ind-1510 Budget Impact Analysis of Biosimilar Denosumab Versus Xgeva for the Prevention of Skeletal Related Events in Cancer Patients with Bone Metastases

PRESENTER: **Arun Jones**
AUTHORS: Linda Siachalinga, Hansoo Kiim, Joshua Byrnes, Kyoo Kim

Background

In advanced solid cancers, metastases to the bone are a common marker of disease progression with poor prognosis. Once cancer metastasizes to the bone, the patient becomes at high risk of Skeletal-Related Events (SREs) such as bone fracture or spinal cord compression. SREs are expensive to treat and result in massive quality-of-life reductions, they therefore represent a large clinical and financial burden to society. Denosumab is a monoclonal antibody effective in delaying the occurrence of SREs in patients with advanced solid cancers. For this indication, denosumab’s patent is soon expiring. Non-inferior biosimilars are primed to enter the market thereafter, as such we aim to estimate the budget impact of switching to a biosimilar in Thailand.

Methods

A budget impact model was created in Microsoft Excel which estimates the number of patients to be treated with denosumab in the next five years. We then calculated the difference in costs between a scenario where all patients over the next five years were treated with the originator brand at list price and one where they are treated with a discounted biosimilar. An alternate scenario was analyzed which aimed to emulate market conditions affecting total budget impact, such as market share split and originator brand price drop. Input parameters were varied by +-20% to quantify the impact of parameter uncertainty on model results.

Results

Over the next five years, we project a total accumulated saving over five years equal to 6.5bn THB in the base case when the biosimilar is sold at a 25% discount to the originator. In the scenario analysis, total accumulated savings were estimated at 2.2bn THB. Results were robust to one-way sensitivity analysis, with the switch being cost saving in all cases. The lower bound of total cost-savings found through sensitivity analysis was 5.2nn THB in the base case and 1.8bn THB in the scenario analysis. The upper bounds were 7.8bn THB in the base case and 2.6bn in the scenario analysis. All inputs are found to be unitarily elastic to the total cost saving.

Conclusions

Switching from originator to biosimilar denosumab for the prevention of SREs in patients with advanced cancers will result in significant savings for payers in Thailand.

Ind-1519 Using Modeling Tool to Estimate Country-Specific Costs for Policy-and Decision-Making in Cervical Cancer Secondary Prevention in Burkina Faso

PRESENTER: **Fadima Inna Kamina YAYA BOCOUM**, Institut de Recherches en Sciences de la Santé
AUTHORS: Winthrop Morgan, Nayi ZONGO, Jacques Fabrice Ella, Linda TRAORE, Cindy L. Gauvreau, Ann Levin, Lisa HUANG

Background Cervical cancer is the second most common cancer among women in Burkina Faso. In 2018 the World Health Organization (WHO) launched the Global Initiative for the elimination of cervical cancer with the goal of 70% of women screened with a high-performance test by the age of 35 and again by the age of 45. To meet this target, national cancer control programs need to plan and develop a budget forcast. Cost estimates of cervical cancer secondary prevention are important for well-informed strategic policy- and decision-making. To support planning efforts, we used a costing tool that 1) estimated cost of scaling up cervical cancer interventions in Burkina Faso for two scenarios and 2) provides five-year scale-up scenarios to support implementation. Method Within the SUCCESS project, the Burkina Faso costing team conducted a micro-costing of scaling-up screening and precancer treatment over five years. Data for target populations by HIV status, facility availability and capacity, healthcare personnel utilization and wages, and supplies and equipment costs were collected and verified with the Ministry of Health. These data were applied to the updated WHO Cervical Cancer Prevention and Control Costing (C4P) Tool . Key stakeholders consisting of policymakers, clinicians and public health advocates were convened for consensus-based model validation and development of country-relevant scenarios. We conducted two scenario analyses to address alternative screening and precancer treatment strategies – 1) continuation of current efforts using visual inspection with acetic acid (VIA); and 2) using a higher-performing test, HPV DNA for 30% of its target population. In both scenarios, the screening coverage is assumed to increase from 10% in 2025 to 70% in 2029. Results Over 5 years, the total cost for scenario 1 is estimated to be $15,285,342 and for scenario 2 $26,035,865. In scenario 1, the largest share of total costs is for program support activities for both financial and economic costs, 53% and 49%, respectively. In scenario 2, the costliest category is cervical cancer service delivery for both financial and economic costs, 55% and 60%, respectively. The financial and economic cost drivers in scenario 2 are HPV DNA testing and laboratory processing (42% and 44%) and training activities (23% and 21%), respectively. With 100% VIA, scaling-up is projected to provide approximately 2 million screenings and 84 000 precancer treatments. In scenario 2 with 30% HPV DNA and 70% VIA, scaling-up is projected to provide approximately 2 million screenings as well; but provide 35% more precancer treatments. Conclusion As Burkina Faso progresses towards universal health coverage, new strategic approaches to prevent cervical cancer are required. Implementing the more ambitious scenario will take the country closer to reaching WHO cervical cancer elimination goals. However, additional funding will be required to reach this scenario, The costs from this study can help inform policymakers to develop effective strategies for implementation in Burkina Faso and act as an effective tool in advocating for budgetary allocations.

Ind-1654 The Health and Economic Benefits of Improving Prehospital Identification of Stroke in Australian Women: a Modelling Study

PRESENTER: **Laura Downey**
AUTHORS: Lei Si, Emily Atkins, Tom Gadsden, Stephen Jan

Objective: In the prehospital setting, emergency medical services are more likely to accurately identify stroke in young men than women. We aimed to estimate the long-term cost savings and gain in quality-adjusted life years (QALYs) that could be achieved if ischaemic stroke was identified in women with the same level of accuracy received by men, versus the status quo. **Design:** Decision tree and** Markov model decision analysis. **Settings, participants:** Two arms including 5,513 women aged under 70 years: (1) a 'hypothetical' scenario, whereby women receive the same level of accurate stroke identification as men (yet experienced symptoms relevant to women); and (2) the status quo. Transitions between post-stroke health states, recurrent stroke and death were made in one-year cycles over 50 years from a societal perspective. **Main outcome measures:** Years of life lived,** costs and QALYs in the hypothetical scenario relative to the status quo. Results were extrapolated to the national level based on the annual number of ischaemic stroke hospitalisations among women across Australia in 2020-21. **Results:** Compared to the status quo, the hypothetical arm gained 0.14 years of life, 0.08 QALYs and cost savings of $2,984 per patient. At the national level for 2020-21, this equates to 252 life years,144 QALYs gained, and cost savings of $5.4 million. Outcomes were most sensitive to the probability of an accurate assessment of stroke, short-term treatment costs, patient age and transition probabilities to 90-day post stroke health states. **Conclusions:** Enhancing the timely and accurate identification of ischaemic stroke among Australian women in the prehospital setting would yield significant health benefits and cost savingsto Australian society as a whole.

Ind-1926 Health State Utility Values in Oesophageal Cancer: a Systematic Review and Meta-analysis.

PRESENTER: **Josipa Petric**
AUTHORS: Victoria Kollias, Norma Bulamu, Maziar Navidi, Muktar Ahmed, Tim Bright, Jonathan Karnon, Sonia Hines, David Watson

Background: Patients receiving treatment for esophageal cancer often experience an array of symptoms affecting their health status, along with physical, psychological and social functioning, which affect their quality of life. Significant limitations exist in the low quality of studies in previous systematic reviews and no application of a MAUI, meaning that QALY inputs for cost utility analysis are scarce. The aim of this systematic review was to critically appraise the literature and summarize utility values for the different health states associated with esophageal cancer care and treatment to inform inputs for cost utility analysis.**Methods:** The following databases were searched: MEDLINE (Ovid), Embase (OVID), Scopus, Web of Science Core Collections, Cochrane Register of Controlled Trials, CINAHL (EBSCOhost) and ProQuest, for articles with data in English from database inception until September 2023. Empirical studies reporting utility values elicited directly or indirectly were included. The quality of the article was assessed using a combination of tools and mean utility values for studies applying the same utility elicitation methods and heath state (disease stage, treatment or treatment timepoint) were pooled using random-effects models.**Results:** A total of 5,929 records were identified and 13 studies were included. Most studies were conducted in China (n=3), the UK (n=2), the Netherlands (n=2) and Australia (n=2). There was a clear description of HRQoL generation with direct evidence collection in each study, and each study was of adequate quality. Utilities were mostly elicited using EQ-5D-3L (53.8%) and EQ-5D-5L (23.1%). Six studies applying EQ-5D-3L were included in the meta-analysis. The pooled utility estimate for EQ-5D-3L at baseline was 0.66 (95% CI 0.56–0.75, I2=83%) for stage I, 0.84 (95% CI 0.81–0.87, I2=48%) for stages II/III and 0.67 (95% CI 0.57–0.78, I2=85%) for stage IV esophageal cancer.**Conclusion and implications for policy:**The EQ-5D is the most prevalent utility-based patient-reported outcome measure applied in esophageal cancer. This review provides utility estimates using EQ-5D-3L at diagnosis for the different stages of esophageal cancer. However, due to heterogeneity in heath states and studies, obtaining robust utility estimates for cost-utility analyses remains a challenge. Larger studies are needed to generate sufficiently accurate estimates.

Ind-2103 Distributional Cost Effectiveness Analysis of Colorectal Cancer Screening Program in Beijing Based on Markov Model

PRESENTER: **Haoran Zhan**
AUTHORS: Shangyao Li, Yitong Lu, Tingting Xu, Yu Su, Yu Tian, Yuxin Sun

OBJECTIVE: This study aims to investigate the impact of a colorectal cancer(CRC) screening program on population health and equity among urban and rural residents in Beijing, as well as what screening strategies are economically feasible to maximize improvements in population health and equity.

METHODS: A Markov model was used to simulate the screening intervention process in Beijing, and a distributional cost-effectiveness analysis was conducted for 37 strategies based on three different screening techniques at different intervals and with different age ranges. We obtained 16 groups of district-specific CRC incidence rates as the anchor target, and constructed district-specific colorectal cancer screening models by adjusting and calibrating the initial state distributions and the all-cause mortality rate. The 1x per capita GDP of Beijing (132,600 yuan) in 2017 was utilized as the willingness-to-pay level. Net monetary benefit (NMB) was calculated for optimal strategy identification. The Atkinson index was used to calculate the health equity level Aε of the health outcomes produced by each strategy. The social welfare function based on Atkinson's index was also used to calculate the Equally distributed equivalent(EDE)-NMB value of each strategy for the trade-off between equity and cost-effectiveness. Parametric and probabilistic sensitivity analysis were used to verify the robustness of the results. Scenario analyses were also used to explore the cost-effectiveness and equity implications of each strategy in suburban populations under scenarios of relatively higher or lower adherence or compliance.**

RESULTS: When the NMB were considered, an annual FIT screening among people aged 40-79 years(FIT (1Y, 40-74 years)) was the optimal strategy among all districts, with a weighted average incremental value of ¥85,809.04 relative to no screening. When the equity impacts were considered, all 37 strategies increased regional health inequality(Aε value for no screening: 0.0002128), and the Aε of each strategy was significantly inversely related to the NMB, with a correlation coefficient of 0.837 ($p<0.001$). When the equity and cost-effectiveness were considered together, FIT (1Y, 40-79 years) was still the optimal screening strategy, with an EDE-INMB of ¥85,764.33 relative to no screening. Probabilistic and parametric sensitivity analyses at a WTP level of 1x GDP per capita demonstrated the robustness of the results. While the sensitivity of FIT screening for nonprogressive adenomas at a WTP level of 3x GDP per capita may be the only parameter influencing the conclusions. Scenario analyses shaowed that the cost-effectiveness and equity of each strategy improved as compliance increased among suburban residents.

CONCLUSION: All strategies were cost-effective for all districts in Beijing, while keeping the unequal impact of health benefits low. FIT (1Y, 40-74 years) was the optimal strategy for all districts in Beijing, in terms of maximizing equity and cost-effectiveness combined. Interventions to improve compliance and adherence for suburban populations can increase the value of the screening program in terms of both equity and health improvement efficiency, Efficiency in health improvement may be a key driver of social value. Care needs to be taken for the sensitivity of the FIT used for non-advanced adenomas.

Keywords: colorectal cancer, screening, equity, economics evaluation; distributional cost-effectiveness analysis

Bali International Convention Centre – Bougainville

Addressing Health Financing Gaps for Mental Health and Other NCDs

MODERATOR: **Hongqiao Fu**,

Ind-377 How Mental Health Shapes Healthcare Costs: Evidence From Australian Longitudinal Survey

PRESENTER: **Mr. Md Ehsanul Haque Tamal, MS, MEcon**
AUTHORS: Kamrul Hassan, Khurshid Alam, Dominic Gasbarro

Background: Mental health conditions pose a significant burden on human civilisation. These conditions not only affect emotional and psychological well-being but also have severe implications for economic outcomes. While research has highlighted association between mental health and healthcare utilisation, the long-term impact of mental health on health expenditure, particularly considering the role of education, remains underexplored.

Objective: We aim to address this gap by examining longitudinal relationship between mental health and health expenditure. We investigated how mental health influences out-of-pocket (OOP) healthcare costs, including expenses for health professionals and medications in a well-functioning health system with universal health coverage like Australia. Additionally, we explored whether education could mitigate the negative impact of poor mental health on healthcare spending by employing theoretical framework of Grossman model.

Methods: Using 22 waves of the Household, Income and Labour Dynamics in Australia (HILDA) survey (2001-2022), we applied fixed-effects regression models to analyse association between mental health and detailed health expenditure components. We controlled for socioeconomic factors and examined the role of education as an effect modifier. To quantify mental health status, we used Mental Health Inventory-5 (MHI-5) metric, which ranges 0-100, implying 100 as good mental health and 0 as severe mental health condition.

Results: Our findings reveal a strong negative association between good mental health and higher OOP healthcare expenditure. A one-unit decrease in MHI-5 score (indicating mental health degradation) is associated with a 0.25% increase in OOP spending (β=-0.0025, $p<0.05$), along with a 0.23% increase (β=-0.00232, $p<0.01$) in health professional fees and a 0.23% increase (β=-0.00231, $p<0.01$) in medication costs. The increase in OOP spending was also associated with long-term illness by 4.8% and regular annual increments by 1.6%.

We further examined relationship between education and health expenditure as postulated in the Grossman model and the efficient producer hypothesis. Our analysis indicates that OOP health expenditure rises with the increase in individual education levels. Individuals with a postgraduate degree spend 16-21% more on health professional fees and 9-18% more in overall OOP expenditures, compared to those with secondary or lower education levels, suggesting that postgraduates are efficient producers of health. Similarly, graduate diploma holders spend 4-12% more, and bachelor's degree holders spend 1-6% more than those who completed high school or below, which supports the Grossman theory.

However, this relationship is nuanced for individuals with poor mental health. Those with graduate diplomas (10% less) or bachelor's degrees (3% less) with poor mental health tend to spend less on healthcare compared to high school graduates. This suggests that mental health issues may diminish the benefits of higher education in terms of efficient health production.

Conclusion: Our study highlights substantial economic burden of mental illness in Australia. While higher education can improve health outcomes for many, it may not fully mitigate the negative impact of poor mental health on OOP healthcare costs. Policy interventions prioritising mental health support and access to affordable healthcare could help alleviate this burden and enhance overall well-being. 2

Ind-2745 Healthcare Use and Costs in Traditional Medicare Versus Medicare Advantage among Older Adults With and Without Dementia: 2011-2020

PRESENTER: **Elham Mahmoudi**

Research Objective. Dementia is a rapidly growing public health concern and an escalating economic burden. In 2024, the direct healthcare cost of dementia in the U.S. is expected to be $360 billion ($1 trillion by 2050).** Improving healthcare efficiency for these high-need, high-cost people is an economic imperative. We examined healthcare use and costs in traditional Medicare (TM) and Medicare Advantage (MA) among White, Black, and Hispanic Medicare beneficiaries (65+) with and without dementia. MA plans are private insurers paid by Medicare on a prospective capitated model, incentivized to provide more efficient healthcare. We hypothesized total and out-of-pocket healthcare costs and Black-White and Hispanic-White variations in these outcomes are lower in MA vs. TM.

Study Design. In a cross-sectional case-control study, we pooled 2011-2020 Medical Expenditure Panel Survey data (nationally representative). We used multivariable generalized linear models to examine total and specific healthcare use/costs (hospitalization, emergency, outpatient, office, home health, and prescription refills). We used gamma and negative binomial distributions for healthcare use and cost, respectively. Two-part regression models were applied, and all models were adjusted for age, gender, race/ethnicity, chronic conditions, family income as a share of the federal poverty level, Medicaid, education, comorbid conditions, perceived physical and mental health, and survey year. Cost measures were inflated to 2020 value. Furthermore, we used the Average Treatment Effect (ATE) to examine the effect of MA on healthcare use and cost. We applied Inverse Propensity Weighting (IPW) to address a potential selection bias into MA.

Populations Studied: Community-dwelling older adults (65+) with and without dementia diagnosis who enrolled in TM or MA. [N=41,546

(MA=17,974; with-dementia=814); TM=23,572; with-dementia=982)].

Principal Findings: Adjusted predicted total healthcare costs among non-dementia beneficiaries were higher in TM vs. MA by $1,444 (no significant difference between TM and MA among dementia patients). There was no difference in out-of-pocket costs between TM and MA. Similarly, while the probability of hospitalization [by 1.1 percentage point (PP)] and cost of hospitalization (by $2,111) was higher among non-dementia beneficiaries in TM vs. MA, there were no differences between TM and MA among dementia patients. White patients with dementia, compared with their Black and Hispanic counterparts, had the highest total (by $5,106 and $2,519, respectively) and out-of-pocket costs (by $1,435 and $1,558, respectively). Hispanic patients with dementia had the lowest likelihood of any hospitalization and emergency visits compared with White (by 8.7 and 13.4 pp, respectively) and Black patients (by 7.6 and 10.33 pp, respectively). White patients with dementia had the highest number of use and costs associated with office visits and prescription refills compared with their Black (by 6.4 visits and $1,874; by 10.5 refills and $1,420, respectively) and Hispanic counterparts (by 2.3 visits and $1,023; by 11.9 refills and $1,414, respectively).

Conclusions: Racial/ethnic variations in healthcare use and costs exist in Medicare. Healthcare costs and racial/ethnic variations among non-dementia patients were lower in MA vs. TM. However, we did not find any evidence of lower costs or lower racial/ethnic variation in healthcare use/costs among beneficiaries with dementia in MA vs. TM.

Ind-1504 Classification of Psychosocial Interventions for Severe Mental Illness: Evaluating the Applicability of WHO's ICHI for Resource Allocation

PRESENTER: **Kuo-yi Jade Chang**
AUTHORS: Richard Madden, Jennifer Smith-Merry, Ivy Yen, Firew Bobo, Nicola Fortune, Luis Salvador-Carulla

Background: Severe mental illnesses affect approximately 4% of the global population. Restoring functioning often requires diverse psychosocial interventions, such as illness management, case coordination, supported employment, family psychoeducation, and housing assistance. However, the lack of standardised terminology for these interventions leads to inconsistent descriptions, inaccurate data collection and inefficient reimbursement processes. As a results, many interventions are not adequately captured or recorded in broader health and social care systems, further undermining resource allocation decisions and evidence-based service planning. **Aims:** This study evaluated the applicability of WHO's International Classification of Health Interventions (ICHI) for classifying psychosocial interventions, its capacity to clearly describe key components, and its potential for integration into routine data collection and billing systems. **Methods:** Three coders independently assigned ICHI codes to psychosocial interventions described in 460 studies identified through a scoping review using a five-stage iterative process. Coding involved ICHI's three axes - Target (entity on which the Action is carried out), Action (deed done by an actor to the Target), and Means (processes and methods by which the Action is carried out) - and extension codes for recipient types, session quantifiers, and factors such as tele-practice and assistive technology use.** A consensus meeting with coders and an experienced ICHI developer was held at each stage to reflect on coding process, refine strategies, and improve consistency. Inter-coder reliability was assessed using Jaccard Similarity Coefficient. Coding patterns - one-to-one (one intervention, one code), one-to-many (one intervention, multiple codes), and many-to-one (multiple interventions, one code) - were documented. **Results:** The ICHI's three-axis structure and alignment with the ICF framework effectively categorise a wide range of interventions, accounting for the interplay between health conditions, functionality, and environment. It supports linking interventions to functionality-focused outcome measures (e.g., engaging in remunerative employment), potentially aiding outcome-based funding decisions. The Action axis captures dynamic processes central to psychosocial interventions, for example, "navigating", "planning" and "collaborating" in case management. Inter-coder reliability for coding the initial 100 interventions yielded a mean Jaccard similarity coefficient of 0.34 (fair agreement) for Target coding, and ranged from 0.54 (moderate) to 0.80 (strong) for Action coding. This variability was attributed to initial unfamiliarity with the ICHI framework, the complexity of the interventions, and vague descriptions of the interventions. All interventions received at least one stem code. One-to-many matches (n = 58) reflected the multifaceted nature of the interventions, requiring multiple codes, while many-to-one matches (n = 14) highlighted gaps in ICHI's specificity, often due to limited codes under the Means axis, which primarily focuses on medical and surgical methods. ICHI's precision and applicability could be enhanced by adding a purpose-designed extension code. The ICHI framework is not designed for fee-for-service reimbursement as it lacks categories for intervention intensity, frequency, duration, service providers and facilities/settings. However, it may hold potential for use in capitation or other remuneration models. **Conclusions:** Integrating ICHI can ensure consistent documentation, enable like-for-like comparisons, support outcome-based resource allocation, and improve client-focused service planning.** Future research should collaborate with practitioners to evaluate ICHI's feasibility and scalability for routine data collection.

Ind-704 Towards Sustainable Mental Health Financing in Ghana: An Analysis of Budget Trends, Challenges and Opportunities

PRESENTER: **Lucy Owusu**, Kumasi Centre for Collaborative Research, Kumasi
AUTHORS: Tessa Roberts, Barbara Barrett

INTRODUCTION

About 13% of Ghanaians are estimated to suffer from a mental disorder yet more than 90% do not receive appropriate treatment. With a psychiatrist to population ratio of 0.13 per 100,000 population, the treatment gap is substantial and attributed mainly to gross underfunding. Addressing this treatment gap and working towards achieving the sustainable development goal to promote mental health(MH) requires sustained financing to build infrastructure and human resource across the country. Unfortunately, very little evidence exists on understanding current patterns in mental health financing including challenges and opportunities to guide policy action. This study reviews mental health budget allocation and explores barriers to mental health financing, highlighting its implications for mental health care and existing opportunities.

METHODS

We used a qualitative situational analysis design using a documentary analysis and in-depth interviews. A total of 10 stakeholders were carefully selected to reflect mental health financing at national and sub-national levels. The documentary analysis involved extracting trends of government budgets allocated to mental health, analysis of reports on mental health expenditure and flow of allocated funds to mental health departments and units at the regions and districts where services are delivered. The interviews focused on understanding barriers to mental health financing, their implications, and the existing opportunities for improving MH financing. A thematic analysis was conducted to synthesise the findings from the data sources.

FINDINGS

Ghana is making progress in recent years to prioritize mental health in the health budget to support mental health services, though the results show evidence of inconsistent budget allocation to mental health. Between 2020 and 2023, budget allocation to mental health declined by 90%. Approximately 98% of the MH budget allocated over these years were spent on the three main psychiatric facilities without evidence of fund transfers to subnational mental health units and facilities. External assistance from donors and development partners, reported to be unreliable and restricted to selected regions, remained the main source of support to sub-national units. The main barriers to inadequate mental health financing in Ghana were highlighted by stakeholders to include increase national debt payment affecting overall health budget and the lack of contextual MH data to inform prioritization and financial investment. Stakeholder interviews also indicated that beyond inadequate health care access, poor MH financing also led to staff attrition, increased out-of-pocket payments for healthcare which causes delays to treatment seeking and consequently worsening patient wellbeing. There is currently plan to include three mental health conditions in the health insurance service package which will be a significant financing breakthrough that can reduce patients' out-of-pocket payments for treatment.

CONCLUSION

While some effort is being made to have a dedicated mental health allocation in the health budget in Ghana, this should be complemented with innovative financing strategies to expand government commitment to the mental health budget. Additionally, research regarding best approaches to address data gap is needed to generate nationally representative mental health data to estimate the true burden that can inform prioritisation and investment.

Ind-2058 Mobile-Money Self-Financing to Improve Hypertension Medication Supply: Evidence From Rural Uganda

PRESENTER: **Caterina Favaretti**, Technical University of Munich

AUTHORS: Vasanthi Subramonia Pillai, Mr. Nikkil Sudharsanan

Background: Health systems in low-resource contexts often struggle to consistently deliver essential services and treatments. In rural Uganda, patients with hypertension (HTN) frequently face medication stockouts at government health facilities that lead to treatment discontinuation or high out-of-pocket costs from private pharmacies. In response to this gap in access, community members in our study setting have developed informal resource-pooling systems to collectively purchase medications in bulk. While these initiatives are crucial, they face challenges such as minimum funding thresholds and logistical delays, which can hinder access to essential medications and adversely affect health outcomes. This study aimed to formalize these informal community-based purchasing systems, by implementing a mobile-money-based self-financing program to improve access to anti-hypertensive medications at a public non-communicable disease (NCD) clinic in Nakaseke, Uganda. The primary objective of our study was to evaluate the program's effectiveness in ensuring consistent medication supply and receipt of medication. We also examined factors related to the scheme's uptake, including any adverse selection effects, and investigated whether participation influenced patients' blood pressure levels. **Methods:** Between August 2023 and February 2024, we recruited 183 participants with HTN from a public NCD clinic in Nakaseke, Uganda. All participants were invited to contribute 5000 Ugandan Shillings monthly via a mobile money account to the health facility to ensure the availability of their anti-hypertensive medications during their next visit. Contributors received medications from a study supply if government stocks were unavailable, while non-contributors relied solely on government stocks. Our primary outcomes included contribution rates and improvements in the overall supply of medications. **Results:** Participants contributed in 47% of eligible months on average. Contribution rates showed no significant differences across education levels or medication need, suggesting minimal equity concerns or adverse selection. Government pharmacies fulfilled only 9% of total prescriptions; however, for contributors, MoPuleesa closed 84% of the remaining gap. Due at least in part to implementation challenges, some non-contributors also received medications, with pooled funds covering 53% of their shortfall. **Discussion and Conclusions:** Our findings demonstrate the feasibility and effectiveness of mobile money pooling in addressing chronic medication shortages. MoPuleesa achieved broad participation and equitable outcomes in a resource-constrained setting, significantly improving medication availability. While not a substitute for systemic reform, such community-driven financing models can serve as effective interim solutions in under-resourced health systems. Future research should explore scalability, sustainability, and integration with the national supply chain and financing mechanisms.

10:30 AM –12:00 PM MONDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Surabaya

Equitable and Sustainable Workforce Policies

MODERATOR: **Chris Schiling**,

Ind-1631 Promoting Equity in Health Care: Evidence on The Rural and Remote Allied Health Workforce and Determinants of Retention and Turnover

PRESENTER: **Jenny Cleland**
AUTHORS: Diana Khanna, Rachel Milte, Ali Dymmott

Background

Rural and remote communities are negatively affected by complex challenges in recruitment, retention and turnover of the allied health workforce which result in reduced access, despite a growing demand. Adding to the inequity, those in rural and remote populations are more likely to experience higher rates of chronic disease, increased hospitalisations, and lower SES status. High costs relating to lost time, recruitment, relocation and training are experienced by employers who have a high turnover of staff. There is a need for a detailed examination of quantitative evidence to aid policy makers develop interventions to increase the rural and remote allied health workforce. The aim of this review was to determine the extent of available evidence from studies with a quantitative component to examine the length of stay and costs associated with the recruitment, retention and turnover of rural and remote Allied Health Professionals (AHP), and any potentially non-modifiable or modifiable factors which have been shown to impact length of stay or turnover.

Methods

Six databases were systematically searched to identify studies that included a quantitative approach. Included studies had to report on either recruitment, retention, turnover, length of stay or associated costs of AHPs in rural or remote settings. Data was extracted using a specifically adapted proforma, analysed, and further examined to synthesise factors- 'personal' and 'organisational'- reporting significant associations. The review was conducted using the PRISMA extension for scoping reviews.

Results

Twenty-four studies were included from Australia, Canada, USA, South Africa and Europe. Only two studies reported costs associated with turnover and recruitment, both from Australia. The studies reported median direct costs ranging from AUD $18000 to $22000, with indirect costs further incurred. Findings indicated length of stay was short in comparison to urban AHPs, with the median duration ranging from 1-3.2 years, and a survival probability of 0.54 at two years which bears significant cost implications for employers. Consistent evidence for statistically significant associations was found between a variety of personal and organisational factors (such as rural education, and rural work placements) and recruitment, retention and turnover. Being integrated into the community, opportunities for career development, good working conditions and financial incentives were also found to be significantly associated.

Conclusion

There remains a significant challenge in maintaining an adequate rural and remote allied health workforce across Australia, but also in several other countries. Despite this, there has been limited evaluation of the direct or indirect cost implications for the public or private healthcare sector. On a more positive note, the findings of this review indicate that there is much evidence for policy makers to design programs to improve workforce access in rural and remote areas, including through supported university places for rural students, targeted educational programs and career and financial incentives. However, while supports such as educational programs supporting recruitment and retention of workers have been shown to be effective, without detailed evidence of the costs and benefits of such programs sustainable funding is likely to remain elusive.

Ind-2302 The Effect of Informal Caregiving on Presenteeism and Absenteeism: Evidence From the United Kingdom

PRESENTER: **Mr. Charles Smith, BSc**
AUTHORS: Sean Urwin, Matt Sutton

Background

Informal (unpaid) caregiving is widespread and has substantial consequences for carer's health, wellbeing and on labour market outcomes. Previous research on the labour supply impacts of caregiving have mainly focused on participation, hours and earnings. There is less research on those who combine informal care and work, including: (i) presenteeism – the reduced productivity whilst working and (ii) absenteeism – the number of days with missed work. These are important to consider given that one in seven UK workers are informal carers.

Aim

To quantify the impact of caregiving on work-related productivity loss focusing on presenteeism and absenteeism.

Data

We use the UK Household Longitudinal Study, a large and nationally representative survey which tracks respondents since 2009 over 13 survey waves. Presenteeism is measured using responses to three questions from the Short Form-12 questionnaire. Absenteeism measured by missing any days of work in the last week due to either personal/family reasons or being sick/injured. We categorise carers as high intensity (at least 20 hours per week) or low intensity (1-19 hours of care per week).

We include a rich set of covariates that account for individual demographics as well as job and health-specific characteristics.

Methods

To quantify presenteeism and absenteeism impacts we apply random and fixed effects regression techniques. Comparisons between the two methods allow us to explore to what degree unobservable and time-invariant individual factors explain any differences between carers and non-carers.

We also test whether informal carers are more likely to leave the labour market than non-carers in our sample.

Results

Our final sample consists of 208,163 individual-wave observations (15.4% are unpaid carers) from 44,266 employed individuals. We identify 12.2% of the sample as experiencing presenteeism, and 1.29% experienced absenteeism in the previous week. We find that high and low intensity carers are 3.27 [95% CI: 2.12, 4.42] and 0.62 [95% CI: 0.15, 1.10] percentage points more likely to report presenteeism than non-carers, respectively, using a random effects specification. Accounting for individual fixed effects we find high and low intensity carers are 1.34 [95% CI: 0.004, 2.78] and 0.22 [95% CI: -0.34, 0.78] percentage points more likely than non-carers to report presenteeism.

High intensity carers are also 1.08 percentage points [95% CI: 0.55, 1.61] more likely to have missed work in the last week due to illness or family reasons than non-carers. This is consistent whether random or fixed effects models are used.

We find that carers are less likely than non-carers to be employed in the subsequent survey wave.

Conclusion

Our study finds that informal carers in employment are more likely to experience presenteeism and absenteeism than non-carers in employment, an effect that is larger for more intensive carers. This suggests that more support is required for informal carers to continue working. Estimates of the productivity losses due to informal caregiving are underestimated if they only consider reductions in labour force participation and do not account for presenteeism and absenteeism.

Ind-2535 The Impact of Motherhood on Female Medical Doctors' Earnings

PRESENTER: **Jia Song**
AUTHORS: Mr. Terence Cheng, Julie Ratcliffe

Background Gender equity in education and labour markets has enabled more women to enter high-prestige professions such as medicine, yet persistent inequalities remain. Despite achieving parity in education and training, female doctors continue to face significant challenges in their professional trajectories, particularly after becoming mothers. Existing literature demonstrates that the arrival of children creates a marked divergence in the labour market outcomes of men and women, with women often bearing the brunt of household and caregiving responsibilities. This effect is especially pronounced in demanding, high-skilled professions like medicine, where long hours and inflexible schedules compound the difficulties of balancing work and family roles. While extensive research has documented the motherhood penalty across general populations, there is limited evidence regarding its impact on elite professions, particularly in the context of Australia. Understanding how childbirth affects earnings trajectories in this group is critical to inform policies that address gender disparities in professional advancement and labour market outcomes.

Aim

This study examines the causal effect of childbirth on the earnings trajectories of Australian female doctors. It investigates the magnitude and duration of earnings changes, explores differences by specialty and family size, and evaluates the role of childcare accessibility in shaping employment outcomes. Providing new insights into the intersection of parenthood and professional career progression.

Methodology Using longitudinal data from the "Medicine in Australia: Balancing Employment and Life" (MABEL) survey (2008–2018), this study employs an event-study approach to track changes in annual gross earnings around the birth of a first child. The sample includes 7,191 doctor-year observations of female doctors, covering a period from four years before to eight years after childbirth. By controlling for individual fixed effects and time-varying factors, the analysis provides robust causal estimates of the earnings impact of motherhood.

Results The findings highlighted a sharp and immediate decline in earnings for female doctors, averaging 42.2% in the year of childbirth. While earnings gradually recover, they remain 35% below pre-birth levels three years after childbirth and only return to baseline eight years later. The impact varies significantly by specialty and family size: general practitioners experience more prolonged earnings penalties compared to specialists, and mothers of three or more children face the greatest long-term reductions. Accessibility to childcare near the workplace emerges as a significant factor, with limited availability delaying mothers' return to full-time employment and earnings recovery.

Conclusion Motherhood imposes substantial short- and medium-term earnings penalties on female doctors in Australia, highlighting the enduring challenges of balancing professional and family responsibilities. These findings underscore the importance of targeted interventions, including improved workplace childcare access and flexible working arrangements, to mitigate the effects of parenthood on career progression. By addressing these barriers, healthcare organizations can promote gender equity and better support female doctors, ultimately contributing to a more sustainable and efficient healthcare workforce.

Ind-2158 Fishing in the Same Pool? The Impacts of Hospital Hiring on Long-Term Care Employment and Quality Outcomes

PRESENTER: **George Stoye**, Institute for Fiscal Studies
AUTHORS: Max Warner, Carol Propper, Ben Zaranko

Objectives: Global demand for both hospital and long-term care (LTC) is rising, and both sectors increasingly struggle to recruit and retain adequate numbers of staff. However, recruitment efforts are rarely coordinated across sectors, with the LTC and the wider healthcare system managed separately in most countries. For example, in England, many care workers leave the LTC sector to join the public healthcare provider – the National Health Service (NHS) – which typically offers higher pay, more job stability and greater opportunities for career progression. This may in turn have negative impacts on the LTC sector, which are so far poorly understood. We aim to fill this evidence gap by examining the consequences of hospital hiring decisions for the labour supply of care workers in residential care homes in England, and the potential health impacts on care users.

Methods: Using monthly NHS hospital payroll data and six-monthly data on staff employed by care homes in England, we first use geographic and time variation in the availability of NHS jobs to study how social care worker numbers change in relation to hospital employment. Specifically, we compare changes in care home staff employed by providers across Travel-to-Work-Areas (TTWAs) with differential changes in the number of relevant NHS staff employed in the same year. We carry out this analysis separately for care workers and registered nurses, using different groups of NHS workers to measure the relevant amount of NHS employment in each case. One key challenge is that local NHS and care home staffing levels may be driven by common factors (e.g. an ageing population demanding both health and LTC services). To address this, we employ a shift-share instrumental variables approach, instrumenting changes in NHS staffing levels with predicted changes based on historical employment patterns and national trends in each staffing group. This relies on the identifying assumption that changes in care home staffing are otherwise unrelated to the share of each NHS staff group employed before our analysis begins. We repeat this with care user health outcomes as the outcome variable to study how changes in staffing impact care quality in residential care homes.

Results: We show hospital hiring decisions have large impacts on employment in care homes. The estimates indicate that if the NHS hires an additional healthcare or nursing assistant, a local care home loses 0.35 care workers, while an additional nurse hired in the NHS reduces registered local care home employment by 0.06 nurses. Preliminary results indicate no impact on emergency admissions from care homes due to these staffing changes. Further work will examine other measures of care home performance and patient outcomes.

Discussion: The results show hospital hiring decisions have significant impacts on employment in the LTC sector in England. This indicates that both hospital and care homes are competing for the same set of workers, and a lack of coordination could undermine policy efforts to improve service outcomes.

Ind-1827 A Health Workforce Planning Model for Palliative Care: Development and Applications

PRESENTER: **Chris Schilling**

Abstract

Introduction

With growing demand for palliative care and an ageing workforce, there is a critical need to develop planning tools that can identify potential shortfalls in the palliative care workforce before they occur. This presentation introduces a new palliative care service planning (PCSP) model for Australia, designed to support strategic planning and workforce development. We discuss the development and validation of the model and use it to project the baseline palliative care workforce over the next 20 years. We then compare policy response scenarios based on the 'Wellbeing in the palliative care workforces' survey.

Methodology

A bespoke systems dynamics PCSP model was developed to capture inflows (new graduates, re-entering the workforce) and outflows (retirements/exiting labour force, death) of the palliative care workforce. The PCSP model projects the counts, full-time equivalents (FTEs) and clinical FTEs of the palliative care workforce by profession (palliative medicine physicians and palliative care nurses), age group, sex, and region (State, rurality). Key data were sourced from the Health Workforce Data (HWD) tool and the 'Wellbeing in palliative care workforces' survey with 1,400 responses. Model validation compared model results with observed results for 2014-2023.

Results

Under the business-as-usual approach, the rate of palliative care physicians is expected to increase to 1.5 FTE per 100,000 population by 2035, and to 1.6 FTE per 100,000 population by 2045, still well short of the service delivery target of 2.0 FTEs. Scenario analysis highlights that a 60 per cent increase in the number of annual graduates would be required to reach the target coverage by 2035. Policy responses to improve the wellbeing of the palliative care workforce has a moderate impact on long-term supply.

Discussion

The results from the PCSP model are sobering. Baseline projections suggest there is little chance that the palliative care workforce will be able to meet current let alone future levels of demand without substantial increases in the number of new graduates.

Bali International Convention Centre – Lotus

Within Trial Economic Evaluations

MODERATOR: **Carl Asche**, Guidelines and Economists Network International (GENI)

Ind-597 Is Prehospital Video Triage for Suspected Stroke Cost-Effective? A Stepped-Wedge Analysis Using Real World Data

PRESENTER: **Jing Yi Jessica Weng**
AUTHORS: PHOTONIC Study Team, Ms. Rachael Hunter

BACKGROUND

Prehospital video triage (PVT) for suspected stroke patients was implemented in four areas of the English National Health Service (NHS) during COVID-19. It enables hospital-based stroke specialists to communicate remotely with ambulance clinicians at the scene of emergency ambulance calls of suspected stroke patients via telephone or videoconferencing; potentially improving the responsiveness of the receiving stroke unit.

RESEARCH QUESTIONS

As part of a mixed-methods study, we aimed to address the following research questions:

\1) Does PVT impact on care delivery and patient outcomes across the prehospital and acute stroke pathways?

\2) Is PVT for stroke cost-effective?

METHODS

To study acute stroke care delivery and stroke patient functional independence, we analysed data from Stroke Sentinel National Audit Programme (SSNAP). To account for sites implementing PVT at different timepoints, we used a stepped-wedge design fitting a mixed effects logistic regression model with age, sex, ethnicity, rurality, stroke type, out-of-hours arrival and stroke severity as covariates, with hospital site as a random effect. Comparator patients were areas of England where PVT was not implemented and pre-implementation timepoints. A second model fitted an interaction with COVID-19. Outcomes included stroke unit as the first ward of admission and functional independence at discharge.

Logistic regression and general linear models employing the same stepped-wedge design will be used to evaluate the effect of PVT on 30-day mortality and length of hospital stay, respectively, using data from Hospital Episode Statistics.

We will conduct an economic evaluation comparing PVT to no triage using a 10-year decision analytic model. The decision model will draw on the same data sources as mentioned above, along with national reference costs and Trust estimates of the cost of PVT. We will report the incremental cost per quality-adjusted life-year gained of PVT compared to no PVT over a 10-year time horizon from a health and social services perspective. The probability that PVT is cost-effective for a range of decision thresholds will be calculated using probabilistic sensitivity analysis.

RESULTS

206,144 patients who had a new hospital admission for stroke in England between April 2019 and August 2022 were included in the SSNAP analysis. There was a significant increase in the likelihood that the 8,434 patients treated in areas with PVT were admitted to a stroke unit as their first ward (Odds ratio (OR): 1.04, 95% confidence interval (CI) 1.03, 1.05) and had improved functional independence (OR:1.005, 95% CI 1.001, 1.010). This effect was stronger during COVID-19 (stroke unit as first ward OR: 2.15, 95% CI 1.89, 2.46; functional independence OR: 1.13, 95% CI 1.02, 1.25). Analysis of care delivery, patient outcomes and cost-effectiveness is ongoing.

CONCLUSIONS

Our preliminary SSNAP analysis found that services using PVT for suspected stroke saw improvement in stroke ward admission and functional independence at discharge, particularly during COVID-19. Our evaluation of the clinical and cost-effectiveness of PVT will contribute to the national priority of rapid deployment and scale-up of digital technologies.

Ind-981 Uncovering the Cost-effectiveness of Theory-based Implementation Approaches: a Health Economic Analysis of the Hide and Seek Project (HaSP) Trial

PRESENTER: **Bonny Parkinson**, Macquarie University

Background: Evidence that a healthcare intervention is clinically and cost-effective, and subsequently funded, does not guarantee adoption into

routine clinical practice. Implementation science can help ensure benefits are realised by improving adoption, although it also involves valuable resources, such as staff time. This study aimed to assess the cost-effectiveness of a theory-based compared to an intuition-based implementation approach to improve referral rates for genetic testing for Lynch syndrome (LS) – a common cause of colorectal cancer (CRC) and a range of other cancers – from the Australian health system perspective. **Methods:** A pragmatic two-arm cluster randomised controlled trial (the Hide and Seek Project, HaSP) compared the approaches across seven large hospitals (N=3,321 patients). Costs associated with the implementation approaches and the strategies were collected during the trial, including staff time, consumables, and once-off and ongoing costs of the strategies. Results were incorporated into Policy1-Lynch, a microsimulation model of testing, surveillance, prophylaxis and treatment of LS probands and at-risk relatives. Costs were reported in 2021 Australian Dollars (AUD). **Results:** Compared with the intuition-based approach, the theory-based approach was previously shown to significantly improve genetics services referral in high LS risk patients ($p<0.0001$); and there was a nominally significant improvement in risk-appropriate tumour testing (P=0.0306). The within-trial analysis found that a theory-based approach reduced once-off and ongoing implementation costs by AUD$2.47 and AUD$0.75 per patient, respectively, versus an intuition-based approach over five years. The modelled analysis estimated that a theory-based implementation approach increased health system costs by AUD$103.74 per CRC patient, but resulted in fewer CRC deaths and more life years gained (LYG), and thus cost AUD$37,679 more per LYG than an intuition-based approach. **Conclusions:** The once-off costs with the theory-based implementation approach were marginally more than with the intuition-based approach, but resulted in more effective strategies that were less costly on an ongoing basis based on the within-trial analysis. Overall, the theory-based implementation approach was cost-effective compared to an intuition-based approach based on the modelled analysis and a threshold of AUD$50,000/LYG. Further research is needed to confirm these results in larger trials, other settings and conditions.

Ind-1168 Cost-Effectiveness of Home-Based COVID-19 Treatments: Findings From the PRINCIPLE Trial

PRESENTER: **May Ee Png**, University of Oxford
AUTHORS: Victoria Harris, Ly-Mee Yu, Christopher Butler, F.D. Richard Hobbs, Paul Little, Mr. Stavros Petrou

Background: SARS-CoV-2, the virus causing COVID-19, infected over 676 million people and caused 14.9 million deaths globally between 2020 and 2021. In the UK, an estimated 1.5 million individuals have experienced lasting symptoms beyond four weeks post-infection, with 20% reporting significant activity limitations. The PRINCIPLE (Platform Randomised trIal of treatmeNts in the Community for epidemic and Pandemic iLlnEsses) trial is a community-based clinical trial designed to identify effective treatments for managing acute COVID-19 symptoms in higher-risk populations (e.g., individuals aged 18+ with comorbidities or aged 65+ without comorbidities). The population was largely unvaccinated when the trial began with azithromycin and remained so until favipiravir and ivermectin were introduced. While the trial evaluated the clinical effectiveness of six treatments, their cost-effectiveness remains unexplored.

Aim: To assess the cost-effectiveness of six COVID-19 treatments (azithromycin, doxycycline, inhaled budesonide, colchicine, favipiravir, and ivermectin) compared to usual care for home-based recovery.

Methods: Within-trial cost-effectiveness analyses were conducted among participants testing positive for SARS-CoV-2 in the PRINCIPLE trial's primary analysis population. Incremental cost-effectiveness ratios (ICERs) were calculated for mean costs versus two co-primary outcomes: hospitalisation/death avoided and day saved until recovery. The base case analysis, from an NHS and personal social services perspective, evaluated costs and effects over 28 days post-randomisation, using multiple imputation for missing data. Sensitivity analyses included adopting a societal perspective, conducting a complete case analysis, extending outcomes to 12 months, and examining pre-specified subgroups. Results were presented as cost-effectiveness acceptability curves across willingness-to-pay thresholds. All costs were reported in 2022/23£, with no discounting for the one-year trial follow-up period.

Results: Base case findings indicated that inhaled budesonide was consistently cost-effective, with an ICER of £6,386 per hospitalisation/death avoided and -£821 per day saved until recovery (south-east quadrant). Colchicine showed the most favourable ICER for hospitalisation/death avoided at £2,858, but its ICER for day saved until recovery was £283, suggesting limited cost-effectiveness in accelerating recovery. Azithromycin and doxycycline were cost-saving in terms of day saved until recovery but had high ICERs for hospitalisation/death avoided (£27,490 and £21,278, respectively), indicating limited cost-effectiveness for preventing severe outcomes. Favipiravir, although having an ICER of £136 per day saved until recovery, showed a dominated ICER for hospitalisation/death avoided. Ivermectin exhibited the least favourable ICERs for both outcomes, making it unlikely to be cost-effective relative to usual care. Sensitivity and subgroup analyses largely supported these findings.

Conclusions: Inhaled budesonide is a cost-effective option for home-based management of acute COVID-19 symptoms, reducing hospitalisations and accelerating recovery compared to usual care. This finding aligns with clinical insights suggesting inhaled budesonide may provide benefits in managing COVID-19 in the community setting.

Implications for policy and practice: This study provides essential insights for policymakers regarding resource allocation in community-based COVID-19 management. Establishing willingness-to-pay thresholds for COVID-19-related clinical outcomes can guide funding decisions, particularly for outpatient management strategies that reduce hospitalisations and support faster recovery. Future work should explore strategies for implementing the most cost-effective treatments, supporting sustained at-home care, and addressing long-term impacts on post-acute COVID-19 symptom management.

Ind-1222 Effect and Economic Evaluation of Pharmacist- led Multi-agent Collaboration Medication Reconciliation:A Randomized Controlled Trial in Hubei Province

PRESENTER: **Zhe Jin**, Huazhong University of Science and Technology
AUTHORS: Da Feng, Xiao Li, Yangfan Sun, Jiaxin Lv, Zhanchun Feng

Background: Polypharmacy among chronic disease patients is a significant global challenge, particularly in China, where the prevalence of

chronic diseases continues to rise. The 2018 National Health Service Survey reported that 34.3% of individuals aged 15 and above in China have chronic conditions, with 23.8% of those over 60 having two or more chronic diseases. Polypharmacy increases the risks of adverse drug interactions, side effects, and poor medication adherence, leading to higher hospitalization and readmission rates, influencing the healthcare costs and patient safety. Although medication reconciliation is recognized as an effective intervention, systematic studies evaluating its effectiveness and economic impact in China remain limited. This study aimed to assess the impact of a pharmacist-led multi-agent medication reconciliation model on the medication safety and cost-effectiveness for chronic disease inpatients. Through a randomized controlled trial, this research addressed an evidence gap by validating the intervention's effectiveness and economic benefits, providing empirical support for its application in chronic disease management.

Methods: This multi-center randomized controlled trial was conducted across 10 tertiary hospitals in Hubei Province,China, from July 2023 to the present,enrolling 1,250 chronic disease inpatients, with 625 patients in the intervention group receiving pharmacist-led medication reconciliation and 625 in the control group receiving standard care. The intervention involved pharmacists' comprehensive medication history collection, discrepancy identification, resolution of medication-related issues, and discharge counseling, while the control group received usual care. Key outcome measures included 30-day all-cause readmission rates, unplanned readmissions, medication discrepancies, and adverse events. Data analysis was conducted by generalized linear mixed models and difference-in-differences methods to assess the intervention's effects and conduct a cost-effectiveness analysis.

Results: Medication reconciliation significantly reduced the incidence of medication discrepancies (44.80% vs. 48.32%, OR=0.840, 95% CI: 0.712-0.993, p=0.041) and adverse events during hospitalization (5.60% vs. 6.72%, OR=0.826, p=0.202). The intervention group showed a significant decrease in 30-day unplanned readmission rates (9.80% vs. 13.26%, OR=0.638, p=0.019), though no significant difference was observed in 30-day all-cause and drug-related readmission rates (p>0.05). The economic evaluation showed an incremental cost-effectiveness ratio (ICER) of ￥5,331.37, indicating that for each readmission prevented, the healthcare system incurs an additional cost of ￥5,331.37, suggesting favorable cost-effectiveness.

Conclusion: The pharmacist-led medication reconciliation model significantly enhanced medication safety for chronic disease patients, demonstrating strong cost-effectiveness. By reducing medication discrepancies, adverse events, and unplanned readmissions, this model shows potential for improving medication adherence and optimizing healthcare resources. Expanding this model across healthcare settings, especially in primary care, could help manage polypharmacy and reduce complications and hospitalizations from inappropriate medication use. To support broad adoption, enhancing the clinical pharmacist workforce and implementing systematic training are essential, as is reinforcing policies that support quality assessment and collaboration within care teams.

Ind-1594 Economic Evaluation of Point-of-Care Testing and Treatment of Sexually Transmitted Infections during Pregnancy in Papua New Guinea (WANTAIM trial)

PRESENTER: **Qinglu Cheng**
AUTHORS: Virginia Wiseman, William Pomat, Lisa Vallely, Handan Wand, Andrew Vallely, Neha Batura, Michaela Riddell

Objectives

Left untreated, sexually transmitted infections (STIs) in pregnancy can lead to serious adverse outcomes for mother and child. Papua New Guinea (PNG) has among the highest prevalence of curable STIs including chlamydia trachomatis (CT), Neisseria gonorrhoea (NG), trichomoniasis vaginosis (TV) and bacterial vaginosis (BV), and high neonatal mortality rates. Advances in STI diagnostics through point-of-care (PoC) testing hold promise for resource-constrained countries such as PNG. This study aimed to conduct an economic evaluation of a cluster-randomized cross-over trial comparing antenatal PoC testing and immediate treatment of curable STIs with standard antenatal care in two provinces in PNG.

Methods

This economic evaluation was conducted prospectively over the trial period (2017–2021) from a societal perspective, including both provider costs and participant costs. Provider costs were incurred by the institutions implementing the PoC tests for CT, NG, and BV, and providing antenatal care. Participant (treatment) costs were the direct and indirect costs of healthcare seeking incurred by women and their families such as medical costs, transport costs and the opportunity costs in terms of lost productivity due to care-seeking visits. Costs were adjusted for inflation using the Consumer Price Index for PNG and converted to 2022 international dollars (INT$) using the Purchasing Power Parity. Incremental cost-effectiveness ratio was calculated and expressed as the additional costs per reduction in the proportion of either preterm birth and/or low birth weight.

Results

Preliminary results showed that over the trial period, the total costs were INT $2,107,101 in the intervention group and INT $1,795,911 in the control group. The proportion of preterm birth, low birthweight, or both among women with gonorrhoea at enrolment (secondary outcome of WANTAIM trial) was 16.2% in the intervention group and 34.2% in the control group (p=0.024). Therefore, the WANTAIM trial costed an additional INT$311,190 to achieve a reduction of 53% in the proportion of preterm or low weight birth among women with gonorrhoea at enrolment.

Conclusions

Further sensitivity analysis will be conducted to account for uncertainty in key model inputs. Scenario analyses will be conducted to identify scale-up options, and budget impact analysis will be undertaken to understand short-term financial impacts of intervention adoption on the national budget. The findings of this study will have the potential to provide decision-makers in PNG and similar settings evidence on the

relative value for money of this intervention and the likely level of investment required for implementation at scale.

10:30 AM –12:00 PM MONDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Dahlia

Growing up Is Hard to Do: Causes and Consequences of Child and Adolescent Health

MODERATOR: **Devaki Nambiar**, The George Institute for Global Health- India

Ind-381 Parental Absence, Bullying Victimization, and Associated Child Health-Related Outcomes in Rural China

PRESENTER: **Yangling Ren**, Southwestern University of Finance and Economics
AUTHORS: Peirong Yang, Gang Chen, Yixiao Liu

Abstracts

Background and Objective: Parental absence is a potential contributor to bullying victimization and its subsequent negative effects on children's health and well-being, especially in rural China. However, the associations, mechanisms and heterogeneous linking parental absence, bullying victimization, and health outcomes remain inadequately understood. This study aims to explore the relationships between parental absence and child health outcomes, including physical health (doctor visits), health-related quality of life (measured by the Child Health Utility 9D [CHU9D] and Pediatric Quality of Life Inventory™ 4.0 [PedsQL]), and subjective well-being (WHO-5), with a focus on the mediating role of bullying victimization.

Methods: Self-reported data from 1912 school-aged children and adolescents in western China were analyzed. Logistic and linear regression models were used to examine the associations between parental absence, bullying victimization, and health outcomes. An instrumental variable approach was employed to assess the robustness of the results. Additionally, subgroup regressions and the Chow test were used to evaluate differences between children with and without siblings for each health outcome.

Results: Parental absence was associated with increased odds of children experiencing both higher probabilities (OR ranging from 1.286 to 1.353) and frequencies (OR ranging from 1.193 to 1.263) of bullying victimization. It also significantly correlated with higher odds of medical visits (coefficient = 0.311, $p < 0.01$), as well as lower CHU9D (coefficient = -0.014, $p < 0.05$), PedsQL (coefficient = -1.631, $p < 0.05$), and WHO-5 (coefficient = -0.256, $p < 0.05$) scores. Bullying victimization partially mediated the effects of parental absence on these outcomes, with frequency of victimization further amplifying the negative effects on physical health, especially regarding medical visits. Cumulative exposure to both parental absence and bullying resulted in increasingly severe health consequences. Children with siblings experienced more pronounced negative effects on health-related outcomes.

Conclusion: This study highlights the complex interactions between parental absence, bullying victimization, and health outcomes among adolescents in rural China. While both parental absence and bullying negatively affect mental health, their cumulative impact on physical health is particularly severe. Furthermore, the presence of siblings, typically viewed as a protective factor, may exacerbate the adverse effects of these challenges. These findings underscore the need for interventions that strengthen family support and provide resources for at-risk children to mitigate these vulnerabilities. Targeted programs focusing on improving family function and addressing bullying are crucial for safeguarding the health and well-being of vulnerable youth.

Key words: parental absence left-behind child, bullying victimization, physical health

, health-related quality of life, child wellbeing, rural China

Ind-2349 The Persistent Effects of Early-Life Stunting on Adolescents: Causal Evidence from the Philippines

PRESENTER: **Eeshani Kandpal**, The World Bank
AUTHORS: Jed Friedman, Deon Filmer

This study estimates rigorously identified, causal medium-run effects of malnourishment in the first 1000 days of life across a range of developmental and human capital measures thirteen years later when the affected individuals are between 14 and 18 years of age. The consensus in the literature is that stunting has negative associations with cognitive achievement (Sanchez, 2017; Hoddinott et al., 2011; Maluccio et al., 2009; Walker et al., 2005), educational attainment (Hoddinott et al., 2011; Martorell et al., 2009), long-term economic outcomes (Grantham-McGregor et al., 2007; Thomas and Strauss, 1997; Galasso and Wagstaff, 2017), and even adult physical health (Alderman, 2011). However, virtually all this evidence has been generated from observational studies with the possibility that these estimates are upward biased (in absolute value) due to the influence of unobserved confounders such as parental choices of child investment, home environment, and even unobserved aspects of income and wealth. Another common approach to the identification of long-run stunting impacts leverages child- or household-level shocks, however these estimates also run the risk of confounding by other child development inputs also affected by the shock.

In contrast, we leverage our previous research in which we identified large, exogenously induced increases in stunting among children from

vulnerable households in remote parts of the Philippines (Filmer et al., 2023). This earlier research showed that the Philippine cash transfer, *Pantawid*, raised the prices of perishable, protein-rich foods in remote areas and therefore *increased* stunting rates among children not born into the program. This original study was a cluster randomized controlled trial in 130 villages across 8 municipalities in 4 provinces of the Philippines. In the current study, we return to these 130 treated and control communities that constituted the experimental sample of *Pantawid* and resurvey 650 children who were 6–59-month-old children in 2011 (Chaudhury, Friedman, and Onishi, 2013). To understand the persistence of stunting impacts, we compare non-beneficiary cohorts in treated communities to the same cohort in similarly poor households in communities that were randomized out of the program. The identifying assumption is that stunting occurs in the first 1000 days of life and is largely irreversible after that (Georgiadis and Penny, 2017). We assess impacts on child anthropometry, cognition, socio-emotional skills, education and health, as well as biological impacts through fecal, buccal, and blood samples. We also account for differences in caregiving, household conditions, and COVID-19 impacts.

Early results show evidence of broad-based catch up on anthropometric and cognitive outcomes, but persistent detriments to measure of noncognitive wellbeing, including executive function. Perhaps most striking, we find that girls who were stunted in early life experience an earlier onset of menarche. Epigenetically, this is likely due to the young infant or in-utero fetus learning that it was in a resource scarce environment and therefore would have fewer years to reproduce, which in turn hastens the onset of menarche. Consistent with there not being a "menopause" for men, there are no impacts on the onset of puberty for boys.

Ind-228 The Role of Dental Health in Human Capital Formation During Adolescence

PRESENTER: **Shuhei Kaneko**
AUTHOR: Cheolmin Kang

Background

Although water fluoridation is widely recognized as an effective public health intervention, the appropriate dosage of fluoride remains a subject of ongoing debate. While numerous studies have demonstrated that fluoridation policies significantly reduce the prevalence of dental cavities, some recent research—including a well-executed causal analysis by Roberts (2024)—has raised concerns about potential adverse effects on cognitive function from childhood exposure to fluoride at levels commonly used in artificial fluoridation programs.

Objective

This study estimates the causal effects of childhood fluoride exposure at levels lower than those typically used in artificial fluoridation programs, leveraging quasi-exogenous variation in naturally occurring fluoride concentrations driven by regional geology in Japan. By combining this variation with unique longitudinal data tracking individuals from birth, nationally representative medical claims and patient survey data, we examine impacts on dental health and human capital development.

Main Results

We find that even low concentrations of fluoride significantly improve multiple dental health outcomes, despite the widespread availability of preventive measures such as fluoride toothpaste. Children in higher-fluoride areas are less likely to visit medical institutions for dental cavities and incur lower monthly dental expenditures.

Contrary to concerns raised by prior studies examining higher-dose exposure, we find no evidence of adverse effects on cognitive outcomes. Specifically, fluoride exposure has no detectable impact on educational attainment, including high school quality or college enrollment.

Importantly, we find that low-level fluoride exposure in early childhood leads to meaningful improvements in non-cognitive skills—particularly among females. A 0.1 mg/L increase in fluoride concentration during childhood (ages 2–12) increases Rosenberg self-esteem by about 4% of a standard deviation. It also enhances the "openness to experience" and "conscientiousness" dimensions of the Big Five personality traits, again only among females. These findings suggest notable gender heterogeneity in fluoride's developmental effects. As a potential mechanism, the results support that improved appearance-related confidence driven by better dental health is a key mechanism.

Validity of Identification Strategy

To support the validity of our identification strategy, we conduct a series of placebo tests. First, we show that fluoride concentrations are not significantly correlated with birth outcomes such as birthweight or gestational age, suggesting no association with underlying health endowments. Second, we find no systematic relationship between fluoride exposure and parental characteristics—including education, age, and parenting quality—reducing concerns about endogenous residential sorting. Third, we show that fluoride levels are not associated with healthcare utilization for non-dental conditions such as asthma, allergies, or influenza, indicating that fluoride is unlikely to affect unobserved health conditions other than dental health.

Policy Implication

Amid recent policy developments—such as U.S. Health Secretary Robert F. Kennedy Jr.'s announcement to end CDC support for community water fluoridation—our findings offer timely empirical insight. Taken together with recent studies, our results suggest that the fluoridation debate should shift from a binary choice of whether to fluoridate toward identifying optimal fluoride dosage. Such discussions must weigh not only the potential cognitive risks of higher exposure but also non-cognitive benefits linked to better dental health.

Ind-966 The Association of Maternal and Child Quality of Life: Australian Cohort Experiencing Psychosocial and Socioeconomic Adversity

PRESENTER: **Shalika Bohingamu Mudiyanselage**
AUTHORS: Anna Price, Jennifer Watts, Eric HY Lau, Julie Abimanyi-Ochom, Ms. Lisa Gold

Background and Objectives Evidence of the relationship between mothers and their children's quality of life (QoL) during early childhood is limited. Our previous systematic review highlighted a particular research gap in mothers' and young children's QoL in disadvantaged communities, especially within well-developed healthcare systems. Therefore, this study aims to explore the associations between maternal and child QoL from children aged three to five years in a cohort experiencing psychosocial and socioeconomic adversity in Australia. **Methods** This study used secondary data from the right@home randomised controlled trial (RCT) of sustained nurse home visiting. The right@home RCT recruited pregnant women experiencing psychosocial and socioeconomic adversity across two Australian states between 2013-2014, and 722 mother and child pairs were followed up from pregnancy to children's fifth birthdays (2013-2021). Mothers' QoL (exposure) was measured at multiple time points using the self-reported Assessment of Quality of Life Eight Dimensions (AQoL-8D) instrument. Children's QoL (outcome) was measured using the parent (proxy)-reported Pediatric Quality of Life Inventory (PedsQL) 4.0 when children were aged three, four, and five. A mixed-effects linear regression model was used to examine the association between maternal QoL and child QoL over the three-time points, adjusting for individual, psychosocial and socioeconomic factors. Missing data was handled using multiple imputations. **Results** Data from 491 (68%) mothers and child pairs and 1,473 observations over 3 years were included. The mean age of mothers at childbirth was 27.6 (SD 6.2), ranging from 14-49 years. 80% of mothers lived in poor neighborhoods, 33% smoked, and 33% had no income during pregnancy. At the age of 3 years, the mean QoL score of children was 87.35 (SD 10.50), and mothers' mean AQoL utility was 0.70 (SD 0.19). The child's QoL was positively associated with the mother's QoL (Adjusted Coefficient (ACE) 13.45, 95% CI: 8.51; 18.37, P < 0.001) and the child's health (ACE 5.34, 95% CI: 4.33; 7.35, P < 0.001). Children's QoL was negatively associated with child age (year 3=ACE -2.64, 95% CI: -3.83; -1.45, P < 0.001) and year 4=ACE -2.93, 95% CI: -4.17; -1.70, P < 0.001), residence in a disadvantaged area (ACE -4.07, 95% CI: -7.06;-1.08, P= 0.008), child body mass index (ACE -1.22, 95% CI: -1.90; -0.54, P < 0.001), premature birth (ACE -4.03, 95% CI: -7.26; -0.88, P = 0.012), formal childcare use (ACE -1.85, 95% CI: -3.15; -0.54, P = 0.006), mother's education (ACE -2.92, 95% CI: -5.37; -0.46, P = 0.020). **Conclusion** Mothers' quality of life is an important predictor of children's quality of life during the first five years. Quality of life in early childhood is associated with maternal, child, and neighborhood determinants of psychosocial and socioeconomic adversity. Government policies across health and welfare need to address the poor maternal and child quality of life in communities facing adversity.

Ind-2232 Childcare Quality and Maternal Mental Health

PRESENTER: **Miryana Dayanti**
AUTHORS: Eric Ochieng, Anne Fitzpatrick, Emily Beam, Maira Reimao

Introduction: Maternal mental health is important, as mothers often shoulder significant childcare burdens, with poor-quality or unreliable arrangements contributing to stress. Prolonged stress negatively affects mental health, impacting both mothers and their children. While much research focuses on childcare availability, perceived quality and satisfaction remain understudied despite their potential role in maternal mental health. Maternal depression, which harms child outcomes, may be influenced by how mothers evaluate childcare. Evidence is mixed. Some studies link high-quality care to reduced depressive symptoms, particularly when care meets expectations, while others find inconsistent effects. Perceptions of limited care availability are more reliably associated with depressive symptoms. Previous studies often assess childcare quality using structured observations and professional ratings, which can be challenging in unregulated settings. Our study evaluates quality across multiple dimensions—caregiver training, practices, nutrition, and infrastructure—while incorporating mothers' perceptions to provide a nuanced understanding of how childcare impacts maternal mental health.

Objective: We examine the relationship between childcare and maternal depressive symptoms, considering type of care, satisfaction, and quality. Using a rich dataset capturing supply (providers) and demand (mothers), we explore how actual and perceived childcare quality and maternal satisfaction relate to maternal mental health. This research adds evidence from a developing country context, where childcare markets are largely informal and unregulated, emphasizing the importance of not just availability but also quality that provides peace of mind.

Methods: We canvassed 51 communities in urban informal settlements across 11 counties in Kenya, mapped boundaries, and surveyed 978 daycare providers and 2,820 caregivers (daycare and non-daycare users). Our analysis focuses on 1,714 biological mothers who completed all mental health questions. Maternal depression was assessed using the 10-item Center for Epidemiological Studies Depression Scale (CESD-10), with 40% scoring 10 out of 30 or higher, indicating depression. Perceived childcare quality was measured as above or below average, and satisfaction with care arrangement was categorized as satisfied, neutral, or dissatisfied. We performed descriptive analysis using OLS with enumerator and strata fixed effects, controlling for household demographics, education, marital status, time use, labor force participation, and socioeconomic characteristics.

Results: We find evidence that perceived below average childcare quality is associated with higher maternal depression scores ($\beta = 2.391$, p-value < 0.01) and clinical depression diagnoses ($\beta = 0.188$, p-value < 0.01) . Similarly, lower satisfaction with childcare arrangements correlates with higher depression scores (βVery Unsatisfied = 2.265, p-value < 0.01), controlling for household demographics, socio-economic status, number of care arrangements, and interviewer and strata fixed effects. Consistent with prior studies, the results underscore maternal perceptions of childcare quality as crucial determinants of maternal well-being.

Conclusions: High-quality childcare supports child development and alleviates maternal stress. Limited access to reliable childcare exacerbates depressive symptoms, increasing burdens on mothers. This study provides suggestive evidence linking childcare quality and satisfaction to maternal mental health and lays the groundwork for future research to explore causal pathways. It underscores the need to consider maternal preferences when designing sustainable childcare solutions, particularly in informal markets with high demand and inconsistent quality.

Bali International Convention Centre – Frangipani

Innovations in the Payment and Delivery of Primary Care

MODERATOR: **Laurence Baker**,

Ind-2221 Effects of Integrating Primary Care and Specialist Physician Practices

PRESENTER: **Laurence Baker**
AUTHORS: Gabriel Sekeres, Kate Bundorf, Anne Royalty

Background: The organization of physician practices may affect the cost and quality of care delivered. In the U.S., primary care physicians (PCPs) may work in practices that also include specialists ("multi-specialty'), or in practices with only primary care physicians. There have been significant shifts toward PCPs working in multi-specialty practices. Economic theory suggest that reduced frictions and improved information flow between primary and specialty care from having PCPs in multi-specialty practices could reduce costs and improve quality. On the other hand, theory also suggests the potential for delivering primary care in multi-specialty practices to increase incentives for inefficient specialist referrals. Understanding whether and how this dimension of practice organization affects care delivery is increasingly important, but relatively little literature examines this question. We investigate effects of having PCPs in multi-specialty practices on the cost and quality of care.

Data: We focus on the U.S. Medicare program, the government-operated health insurance program primarily for the elderly. Following methods developed by Finkelstein, Gentzkow, and Williams, we identify 181,075 individuals age 65-99 in "traditional" Medicare who move from one Hospital Referral Region (HRR) to another between 2007 and 2019, tracking each for up to 13 years before and after the move (1.9m person-years). When individuals move, they must change PCPs. We identify each mover's source of primary care in the pre- and post-move periods and identify those who switch between primary-care-only and multi-specialty groups and those who do not. We measure each mover's total annual spending (including physician, inpatient and outpatient facility, prescription drug, skilled nursing, home health, hospice, and equipment spending), spending and utilization by categories, and ambulatory care sensitive admissions as a quality measure.

Methods: We estimate stacked event study models to determine the impact of practice type on a range of outcome variables, identifying effects from those who switch relative to those who stay in the same type of practice, including individual and calendar time fixed effects and controlling for characteristics of the origin and destination HRRs. The stacked event study models account for heterogeneous treatment timing and allow investigation of possibly heterogenous treatment effects. We emphasize results from models that separately examine those who begin in primary-care only practices, some of whom switch to multi-specialty, and those who begin in multi-specialty practices, some of whom switch to primary-care only.

Results: Switchers and non-switchers have similar demographic characteristics. Event study models find no evidence of pre-trends. Receiving primary care in a multi-specialty practice is associated with a decrease of $300-$400 per year in total spending, about 4% ($p<.01$). Multi-specialty patients have 0.41 fewer primary care visits per person per year, 0.06 more specialist visits, and 0.01 fewer hospitalizations (all $p<.01$). Quality of care measures are not changed. A broad range of specification tests yields generally stable results. Changes in health status do not appear to differentially lead movers to switch to or from multi-specialty practices.

Conclusions: Primary care delivered in multi-specialty practices leads to increased efficiency. Policies that would affect the further development of multi-specialty practices should account for this.

Ind-2418 Private Equity Investments in Primary Care and Changes to Medicare Spending and Utilization

PRESENTER: **Yashaswini Singh**
AUTHORS: Christopher Whaley, Meehir Dixit

Research Objective: Private equity (PE) firms have increasingly acquired physician practices in the United States. This trend is of particular importance within primary care, given provider shortages and declining independent practices. On the one hand, PE's emphasis on short-term profitability may increase overuse of health care services to increase health care spending without commensurate patient benefit. On the other hand, PE investments may facilitate improved coordination of care through technological investments. Despite its significance, no prior research has examined the effects of PE acquisitions in primary care. The objective of this study is to examine changes in Medicare spending, patient out-of-pocket spending, and utilization of primary care services following PE acquisitions in primary care from 2016-2022.

Study Design: We identified 177 PE acquisitions in primary care between 2016 to 2022 using data from Pitchbook and the Medicare Data on Provider Practice and Specialty. We linked acquisition data to outcomes constructed using a 20% sample of Medicare fee-for-service data from 2016-2022.

We examined the effects of PE acquisitions relative to matched controls using a difference-in-differences design. Each PE-acquired practice was matched to up to 3 control practices. We used data from 6 quarters prior to acquisition through 6 quarters after, with the quarter of acquisition as the reference period. The unit of analysis was the physician-quarter. All regressions included physician and time fixed effects to account for time-invariant practice-specific attributes and secular trends. Standard errors were clustered at the level of the matched group (PE-acquired practice and its set of matched controls).

Primary outcomes include measures of spending and utilization, including Medicare spending, number of services billed, and number of unique

patients per physician. In secondary analysis, we examined patient-level measures of care coordination, including out-of-pocket spending on primary care vs specialty care and the number of physicians seen for primary vs specialty care.

Principal Findings: Relative to matched controls, physicians in PE-acquired primary care practices exhibited an average increase in Medicare spending of $1894 per physician-quarter or a 29.8% increase from baseline ($p<0.01$). This increase was driven by increases in the number of services billed per physician by 61 claims or 33.2% ($p < 0.01$) and increases in the number of patients by 26 patients or 26.2% ($p < 0.01$). Following acquisition, patients in PE-acquired primary practices had visits with a greater number of physicians for primary and specialty care and higher out-of-pocket spending on specialty care by $36 per patient-quarter or 14.3% ($p < 0.01$).

Conclusion: PE acquisitions in primary care increased Medicare spending by 30%, driven by increases to both the number of billed services and patients seen. Patients in PE-acquired practices had visits with a greater number of physicians, resulting in increased out-of-pocket spending on specialty care. Take together, our results suggest that PE acquisitions increase health care spending and utilization of primary care services with no evidence of improved care coordination. Policymakers must monitor the growth of PE investments in primary care to mitigate the undesirable effects on the cost and quality of care.

Ind-2284 Integrating Virtual Primary Care: Evidence and Learnings from Lower-Middle Income Countries

PRESENTER: **Divya Srivastava**, London School of Economics & Political Science
AUTHOR: Anooj Pattnaik

Background Digital health communication technology in primary care (also termed virtual primary care, VPC)) allows patients to interact with health practitioners remotely through email, text, online chat, video or phone. Use of VPC grew exponentially in lower-and-middle-income countries (LMICs) during Covid-19. However, they grew within health systems that were not set up for this type of service delivery, from the regulatory and financing side to the underlying infrastructure and information systems. A question also remains on whether the growth of VPC contributes to persisting digital exclusion for underserved populations. This paper reviews the evidence and challenges LMICs faced when trying to set up these virtual primary care systems in the face of increasing demand but intransigent legacy health systems. **Methods** We apply an adapted novel framework, built on the World Health Organization building blocks for health systems functions. First, we conduct a targeted literature review that includes PubMed, CINAHL, EBSCO, Web of Science, Scopus, Cochrane Review, Google Scholar, between 2013 and 2023. We then map LMIC findings from three illustrative countries which have had significant activity in virtual primary care in recent years: Indonesia, Kenya,Thailand against the adapted WHO's framework. The targeted review is complemented with a three-round Delphi consensus building exercise which is currently underway. The Delphi exercise involves an international group of experts focussed along seven themes to examine virtual primary care systems: (1) stated policy objectives, (2) regulation and governance, (3) financing and reimbursement, (4) delivery and integration, (5) workforce training and support, (6) IT systems and data sharing, and (7) patient involvement. **Results** Preliminary results, indicate that the deployment of VPC in LMICs was largely in the private sector with little regulation or policy guidance. Common challenges include lack of basic infrastructure (especially in rural areas), non-existent governance, legal, and regulatory systems for digital health, fragmented and often paper-based information systems, and nascent or limited national health insurance schemes for providers to contract with and be incentivized by. This is in the face of growing public demand for virtual primary care systems coupled with real equity and access barriers around infrastructure and costs associated with private provision. **Conclusions** LMIC experiences highlight how the intense need for digital alternatives during the pandemic led to the rapid and innovative growth of VPC primarily in the private sector. We found that LMIC governments struggled to keep up with this rapid deployment, with little effective regulation or policy change to integrate this private VPC into the health system, protect the privacy and data of citizens, or ensure access to those in most need. The standardized framework itself proved valuable in allowing a comparative approach to facilitate the assessment of VPC in LMICs. 2

Ind-2670 Unlocking Fiscal Autonomy: The Economic Impact of the BLUD Model on Strengthening Primary Health Care in Decentralized Indonesia

PRESENTER: **Rooswanti Soeharno**
AUTHORS: Hadrian Marta, Mrunal Shetye

Background. Decentralized governance in health systems is a strategy for improving equity and efficiency by empowering local authorities. In Indonesia, the BLUD (Regional Public Service Agency) model grants financial and operational autonomy to Puskesmas (community health centers), enabling them to address local health needs effectively. However, evidence on the economic impacts of fiscal autonomy in low- and middle-income countries is limited. This study evaluates the BLUD model's economic implications in West Nusa Tenggara (NTB), focusing on its potential to transform primary health care (PHC) delivery within decentralized systems. **Research Aim.** The study investigates how the BLUD model impacts revenue generation, resource allocation, and health outcomes in decentralized health systems and assesses its scalability and sustainability. **Methods.** A mixed-methods approach was employed, combining quantitative analysis of financial and health performance data (2021–2023) from BLUD-enabled Puskesmas in West and East Lombok with qualitative insights from stakeholder interviews. Financial metrics included revenue growth, expenditure patterns, and service utilization rates. Strategic flexibility was used as the theoretical framework to explore its role in enhancing innovation and organizational performance. **Results.** The BLUD model significantly improved fiscal performance and operational efficiency. In West Lombok, BLUD-enabled Puskesmas achieved a 20% revenue increase over two years, reinvesting funds into infrastructure, workforce expansion, and innovative health initiatives such as TB detection and vision screening programs. East Lombok demonstrated similar gains despite geographic and resource challenges. Qualitative findings highlighted the model's ability to foster innovation and responsiveness while emphasizing disparities in governance, technical expertise, and resource allocation. Strategic flexibility emerged as a critical enabler, with innovation partially mediating the relationship between financial autonomy and organizational performance. **Conclusions.** The BLUD model offers a scalable framework for strengthening fiscal autonomy and operational efficiency in decentralized PHC systems. By fostering local innovations and targeted investments, it enhances service quality and responsiveness. However, successful nationwide implementation requires capacity-building, equitable resource allocation, and robust monitoring systems. **Policy and Practice Implications.** The BLUD model's success hinges on key strategies: building local capacity through

financial management and governance training, addressing fiscal and technical disparities across districts, and promoting strategic flexibility to enhance innovation and performance. Standardized monitoring frameworks are crucial for ensuring accountability and transparency. Globally, the BLUD model offers actionable insights for low- and middle-income countries, providing a replicable framework to strengthen decentralized health systems and advance Universal Health Coverage through equitable and sustainable primary health care delivery.

abs-os139 Accounting for Morbidity in Capitation Payments: A Person-Based Model for Primary Medical Care in England

PRESENTER: **Ms. Laura Anselmi**, The University of Manchester
AUTHORS: Shaolin Wang, Evangelos Kontopantelis, Michael Anderson, Matt Sutton, Yiu-Shing Lau

Background: Accurate needs-based capitation is key to effective and equitable primary care funding. Most existing capitation formulae use only basic demographic and area characteristics. Payment to general practices in England are informed by capitation weights based on a formula developed and are now outdated and unlikely to reflect the additional needs of general practices serving more deprived populations. We developed needs-based capitation weights for England using alternative sets of morbidity indicators recorded in primary and secondary care.

Methods: We used nationally representative data on 12,667,755 million patients registered with 1,397 general practices in England on 1 April 2018 from the Clinical Practice Research Datalink (CPRD) linked with secondary care records from the Hospital Episode Statistics (HES). We used linear regression to estimate the association between cost-weighted We used linear regression to estimate the effects of age and gender, ethnicity, area-level deprivation, new registration and morbidity on cost-weighted consultations with primary care staff. We measured morbidity using three sets of indicators recorded in primary or secondary care, covering 20 to 209 conditions. We computed relative expected workload by applying the regression coefficients to person level data in CPRD and to available national data on registered populations for all 6,892 practices in England.

Results: Workload was on average £110 per patient per year, varying between £7 and £882 for patients with at least one appointment and between £47 and £179 across practices.** Workload increased with age and with deprivation, but these gradients halved when morbidity was included. When primary and secondary diagnoses were included, the range of average relative workload per patient widened from 0.84-1.14 to 0.73-1.20 between practices at the 5th and 95th percentiles, and from 0.96-1.03 to 0.94-1.06 between the least and most deprived deciles. Alternative sets of diagnoses produced similar patterns.

Conclusion: The inclusion of morbidity represents needs more accurately and re-directs resources toward practices in more deprived areas. Strengthening of routine diagnostic recording and data linkage is recommended to support the practical use of more refined, complete and comprehensive morbidity indicators. Further analysis and discussion on implementation aspects will be presented.

10:30 AM –12:00 PM MONDAY [Health Beyond The Health System]

Bali International Convention Centre – Nusa Dua

Hidden Costs, Social Policies, and Health Equity

MODERATOR: **Shiko Maruyama**, The University of Osaka

Ind-2403 Financial Burden of Non- Medical Expenditure Due to Long Travel Distance in Cancer Patients Treated As Tertiary Cancer Center

PRESENTER: **Mohit Pandey**
AUTHORS: T R Dilip, Manish Bhandare, Shailesh Shrikhande

Abstract

Background & Aim:

Cancer care offered in India and large part of the world is heterogenous with few regions having dedicated high volume centres with established referral patterns. Due to scarcity of the specialized units treating cancer, patients often have to travel for long distances for medical care. Our study examines the impact of additional financial burden (non-medical expenses) on cancer patient's families due to long distance travelled while seeking treatment for gastric and pancreatic cancer.

Methods:

The data (n=244) was collected as part of a prospective, non-interventional cohort study conducted at Tata Memorial Hospital (TMH), Mumbai, India; from March to December 2023. Consecutive patients with gastric and pancreatic cancers registered under GI A division of the GI & HPB surgery unit were included. The medical and non-medical expenditures were collected for each visit along with other cancer specific and treatment details.

Results:

The mean distance travelled by patients was 1,475 km. 63.1% of patients travelled greater than 1,500 km. The mean Non-Medical Health

Expenditure (NMHE) for patients traveling more than 1,500 km was ₹107,040 ($1278), nearly two times higher than the expenditure for patients traveling less than 500 km, ₹49,112 ($587). A total of 42.9% of NMHE was spent on travel, 33.3% on accommodation, and 17.2% on food. The logistic regression results depict that patients traveling >500km are three times more likely to experience Catastrophic NMHE (CNMHE) compared to <500km.NMHE . The distress financing due to cancer treatment was 39.3%. Distress financing was higher with CNMHE at 25% (52.8%) compared to CNMHE at 10% (45.8%), and was two times higher in patients travelling >500 km compared to <500 km

Conclusions:

A structured decentralization of cancer care is the need of the hour to negate the additional financial burden and CNMHE experienced by the cancer patients and their families. If adequate infrastructure is provided at the non-urban areas, well trained oncologists can be deployed in hospitals closer to patients homes to treat cancers at earlier stage.

Ind-434 Restricting Mothers' International Migration and Child Health

PRESENTER: **Takuya Hasebe**, Sophia University
AUTHORS: Bilesha Weeraratne, Yuma Noritomo

Abstract

International migration provides significant economic opportunities and a vital source of income through remittances in developing countries. However, it can negatively impact children left behind by separating them from their parents, especially their mothers. Although the effects of maternal migration on children are important for policy and scholarly interest, they remain relatively understudied. Leveraging a 2013 policy change in Sri Lanka—a country with a long history of female international migration—we examine how restricting mothers of young children from migrating for employment impacts children's health outcomes. This policy, aimed at protecting children under five, provides a unique natural experiment for our study. We specifically focus on child health outcomes, which are likely influenced by the increased maternal presence and caregiving at home.

To identify the impacts, we employ a difference-in-differences (DID) approach, using nationally representative, repeated cross-sectional data from the Household Income and Expenditure Survey. Our DID approach leverages temporal variations before and after the policy change, along with cross-sectional differences between households with the youngest child under 5 (treated group) and those with the youngest child over 5 (control group).

We find that the policy exposure leads to a significant decrease in impatient care for illness and injury, indicating improvements in child health. Specifically, the policy reduces inpatient care for illness by 0.8 percentage points and for injury 0.3 percentage points. Our analysis suggests that this improvement is likely driven by the increased presence of mothers at home induced by the policy change. As intended, the policy discourages mothers from migrating abroad and encourages them to stay home, decreasing the likelihood of any household member migrating abroad by 1.7 percentage points and increasing the likelihood of maternal presence at home by 1.2 percentage points. Maternal presence may improve child health through more investment in child health capital by preventing serious injuries through supervision.

One concern is the income effect—restricting international migration may limit economic opportunities to earn and send remittances from abroad, which could negatively affect child health. Even though the policy reduces international remittances significantly, this is offset by an equivalent increase in domestic remittances, resulting in no significant change in total household incomes. We also observe greater labor supply from male household members, suggesting that households respond to potential income reductions by adjusting intra-household labor supply.

The results highlight the trade-offs between the economic opportunities provided by international migration and the benefits of maternal presence for child health. As intended, increased maternal presence appears to enhance childcare at home. However, this effect may be facilitated by intra-household labor adjustments, as the availability of local labor opportunities, particularly domestic migration for men, helps to offset the economic impact of reduced international remittances. The policy implication is that ensuring sufficient domestic labor opportunities is essential for compensating households for the loss of international remittances.

Ind-445 Charitable Giving for Health: Who Benefits From Aotearoa New Zealand's Givealittle Crowdfunding Platform?

PRESENTER: **Paula Lorgelly**, University of Auckland
AUTHORS: Daniel Exeter, Richard Edlin, Nick Young

Background: Crowdfunding for health has become an increasingly popular way to finance healthcare expenses. Crowdfunding is a means to address gaps in health coverage and limitations in social welfare systems. There are numerous crowdfunding web-based platforms globally, where patients, caregivers or friends request donations to support and fund a range of unmet needs: from experimental therapies abroad to lost income and wages due to incapacity. Previous research has considered the risks and benefits of crowdfunding medical expenses, including that it may exacerbate inequities. Much of the literature focuses on cross-sectional analysis. Exploiting new methods of collating publicly available data and text mining, this paper seeks to understand crowdfunding of health in a country with universal health coverage but a system with growing inequities over time.

Aim: We sort to understand the level of unmet health need in Aotearoa New Zealand by exploring the nature of health-related charity request over time, and additionally investigating the determinants of success with respect to charitable donations received.

Methods: Web scraping was used to collect data from health-related crowdfunding campaigns from *Givealittle*, Aotearoa New Zealand's most

prominent crowdfunding platform. We undertook a process of data mining on both open and closed campaigns, extending back to April 2016. Natural language processing (NLP) and large language models (LLM) extracted information from the narrative/pitch/description of the campaigns to understand the nature of illness or condition, the age of the individual, the reason for the request and the location. Numerical information on the goal, amount raised, number of donors and days active were also downloaded. We employed dimensionality reduction techniques for data visualisation of topics and traditional statistical analyses to understand the predictors of success.

Results: We collected data on 10,418 crowdfunding campaigns focusing on health. The number of campaigns has increased steadily over time from 1,225 in 2017 to 1,338 in 2023, with an expected reduction in 2020 & 2021 due to Aotearoa's pandemic response. A large number of campaigns were requesting funds for cancer care; at any one month during the period there were on average 38 requests for donations for cancer. Causes mentioning coronavirus increased in prominence in 2020 and 2021 but have since diminished. On average campaigns are open for 4.7 months, raise NZD7,950 from 81 donors. Health-related campaigns achieve on average 65% of the targeted funding goal. Data visualisation and regression analysis to understand relationships and determinants of success is ongoing.

Conclusions: We explore the unmet health need in Aotearoa New Zealand using machine learning techniques to exploit publicly available data on charitable requests. Not only does it offer insights with respect to what needs are unmet and which campaigns are most successful, it also offers at example of the application of machine learning techniques to health economic issues.

10:30 AM –12:00 PM MONDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Magnolia

Discrete Choice Experiments

MODERATOR: **Fern Terris-Prestholt**,

Ind-1 What is Patient-Preferred Tuberculosis Care? A Discrete Choice Experiment Among Patients with Tuberculosis in Nepal

PRESENTER: **Tara Prasad Aryal**
AUTHORS: Jeevan Thapa, Vijay G.C., Kedar Baral

Background

Directly Observed Therapy (DOT) is a well-established treatment approach for tuberculosis (TB). However, the health outcomes of people with TB continue to be less than optimal, and there is often lack of emphasis on prioritizing patient-centered care. Gaining insight into patients' preferences regarding TB management is crucial for developing a more patient-focused care model. There is a dearth of research that considers patients' preferences in TB management in Nepal, and this study aims to address this research gap by evaluating patients' preferences for improving TB care in Nepal.

Methods

We conducted a discrete choice experiment to elicit patients' preferences for TB care. Drawing upon the findings from the review of literature, in-depth interviews with patients, and consultations with experts, we identified six TB care attributes (five attributes with two levels and one with three levels): type of patient card; gender of the healthcare provider; psychosocial support; waiting time; type of TB care provider; and transportation incentive. A total of 24 choices were generated using a fractional factorial design in R and then organized into four blocks, each containing six unlabelled choice sets. Participants were randomly assigned a block number through a lottery and were instructed to select their most preferred option between two hypothetical TB care models.

Data were collected between December 2022 and February 2023, from 138 participants (age ≥ 18 years) receiving treatment for drug-susceptible pulmonary TB. Participants were proportionally recruited from the top 20 government DOTs centers selected based on annual TB case notification in Chitwan district. We employed a conditional logit model to determine the patient preferences for different attributes of TB care and estimated the relative importance of each attribute using the range method.

Results

The final analysis included 133 participants (96% response rate). Overall, participants had significant positive preferences for three attributes: patient card with instructions (Relative importance (RI): 38.4%, $p<0.001$); provision of psychosocial support (RI: 30.7%, $p<0.001$); and a patient waiting time of less than 30 minutes (RI: 15.6%, $p=0.002$), for improving TB care. Sub-group analyses showed that illiterate participants, compared to literate, preferred to have a patient card with instructions ($p=0.01$) and provision of psychosocial support ($p=0.03$).

Conclusion

The DOT approach to TB treatment and control should consider patients' preferences to improve the TB care provision in Nepal. Including patients' preferences in TB care help improve the effectiveness of the DOTs programme and can also be used to evaluate the cost-effectiveness of patient-centred TB care. This will have policy and healthcare resource usage implications for low-resource settings like Nepal.

Keywords: discrete choice experiment, patient-centered, preferences, tuberculosis, Nepal

Ind-45 Examining NHIF Members' Preferences and Trade-Offs for the Attributes of Contracted Outpatient Facilities in Kenya: A Discrete Choice Experiment

PRESENTER: **Jacob Kazungu**
AUTHORS: Edwine Barasa, Matthew Quaife, Justice Nonvignon

Background Patient choice of health facilities is increasingly gaining recognition for potentially enhancing the attainment of health system goals globally. In Kenya, National Health Insurance Fund (NHIF) members are required to choose an NHIF-contracted outpatient facility before accessing care. Understanding their preferences could support resource allocation decisions, enhance the provision of patient-centered care, and deepen NHIF's purchasing decisions. **Methods** We employed a discrete choice experiment to examine NHIF members' preferences for attributes of NHIF-contracted outpatient facilities in Kenya. We developed a d-efficient experimental design with six attributes, namely availability of drugs, distance from household to facility, waiting time at the facility until consultation, cleanliness of the facility, attitude of health worker, and cadre of health workers seen during consultation. Data were then collected from 402 NHIF members in six out of 47 counties. Choice data were analysed using panel mixed multinomial logit and latent class models. **Results** NHIF members preferred NHIF-contracted outpatient facilities that always had drugs [β=1.572], were closer to their households [β=-0.082], had shorter waiting times [β=-0.195], had respectful staff [β=1.249] and had either clinical officers [β=0.478] or medical doctors [β=1.525] for consultation. NHIF members indicated a willingness to accept travel 17.8km if drugs were always available, 17.7km to see a medical doctor for consultation, and 14.6km to see respectful health workers. Furthermore, NHIF members indicated a willingness to wait at a facility for 8.9 hours to ensure the availability of drugs, 8.8 hours to see a doctor for consultation, and 7.2 hours to see respectful health workers. **Conclusion** Understanding NHIF member preferences and trade-offs can inform resource allocation at counties, service provision across providers, and purchasing decisions of purchasers such as the recently formed social health insurance authority in Kenya as a move towards UHC.

Ind-226 Developing a Personalised Decision Aid Incorporating a Discrete Choice Experiment: A Case Study in Ulcerative Colitis

PRESENTER: **Tara Wickramasekera**

Background: Choosing the best treatment option is difficult for patients with ulcerative colitis given the range of medical and surgical options, with different side-effects and effectiveness. A well-established literature shows that decision aids used in parallel with clinical advice, can have a positive effect on reducing decisional conflict and enhancing informed decision making. While there are some decision aids for ulcerative colitis, they mainly contain static information and do not adapt to the dynamic nature of individual patient needs and preferences. The proposed study aims to fill a knowledge gap by developing an innovative decision tool that can tailor the choice of treatment to fit patients' preferences using the discrete choice experiment (DCE) method. **Aim:** To develop a personalised decision tool to promote informed decision making for patients who are considering medical or surgical treatments for ulcerative colitis. **Methods:** A DCE survey was developed containing competing treatment profiles, described using all important aspects of the treatment (effectiveness/side-effects/family planning). Patients (n=300) with ulcerative colitis were asked to consider the benefits and disadvantages of each treatment profile and select the treatment that they would choose. The DCE data was analysed using mixed logit and latent class models. The model results were integrated to an online platform using a Shiny app. **Results:** R Shiny was successfully used to enable the real-time personalisation of DCE results. The developed decision aid contains two aspects of personalisation. First, attribute importance scores showed the treatment characteristics that mattered most to patients based on their DCE choices. Second, a "best-match" treatment that aligned with their preferences were provided from uptake rate calculations. User testing of the developed decision aid is ongoing. However, initial feedback from patients has been positive. **Conclusions:** A key challenge in developing personalised decision aids is providing real-time, tailored recommendations based on individual preferences. This study demonstrates the feasibility of integrating DCE methods into personalised decision aids for ulcerative colitis. By tailoring treatment recommendations to individual patient preferences, this tool has the potential to empower patients, reduce decisional conflict, and enhance shared decision-making between patients and healthcare providers.

Ind-575 Preferences of Men Who Have Sex with Men Towards the Distribution of HIV Self-Test Kits Through Social Networks in Australia

PRESENTER: **Jason J. Ong**, Monash University
AUTHORS: Ying Zhang, Eric PF Chow, Tiffany Phillips, Christopher K. Fairley

Background: Since the World Health Organization (WHO) endorsed HIV self-testing (HIVST) in 2016, its implementation has been scaled up worldwide to complement existing HIV testing strategies. Among the HIVST distribution models, distribution of HIVST kits through social-networks has emerged as a promising strategy to enhance testing accessibility and acceptability and to increase linkage to care following self-testing. This approach leverages existing personal, social, or community connections to disseminate information, resources, or interventions. Using a discrete choice experiment (DCE), we aimed to identify the factors that influenced gay and bisexual men who have sex with men (gbMSM)'s preferences regarding the distribution of HIV self-test kits through social networks and examine their relative importance. Understanding these preferences can inform targeted interventions to increase HIV testing rates among this key population.

Methods: An online DCE survey was conducted among gbMSM in Australia between December 2023 and May 2024. Participants were recruited through both social media and posters in clinics and community organisations. Each participant was presented with a series of seven choice sets related to distributing HIVST kits, each containing two hypothetical scenarios described by attributes such as cost, location, training, support system, and self-reporting of HIVST results. Mixed logit models with interactions (country of birth, first language) and latent class analysis were used to explore heterogeneity in preferences.

Results: There were 251 participants, including 140 (56%) overseas-born gbMSM, with a mean age of 36.5 (SD= 11.9). Participants who did not speak English as their first language (29/251, 12%) showed a lower preference for paid HIVST kits ($30 or $60 out-of-pocket cost for three

HIVST kits) and were less likely to favour online video chats with sexual health professionals as pre-test support for their sexual partners or social contacts. Overseas-born participants also preferred not to attend 30-minute or one-hour training sessions on distributing HIVST kits to social contacts. Participants in Class 1 (61.7%) were willing to pay up to AUD 30 for a set of three HIVST kits, whereas those in Class 2 (38.3%) exhibited strong resistance to paying for the kits and showed a lack of interest in self-reporting their test results via phone calls.

Interpretation: Our findings highlight the importance of subsidising HIVST kits and developing alternative support systems for overseas-born gbMSM who do not speak English as their first language. Moreover, the limited preference for pre-test support through online video chats and resistance to lengthy training sessions among these subgroups emphasises the need for culturally sensitive, time-efficient, and accessible support mechanisms. Aligning interventions with these identified preferences—such as offering affordable kits and simplifying support options—can improve HIV testing accessibility, reduce disparities, and promote equitable HIV prevention outcomes across diverse gbMSM communities.

Ind-1219 Preferences of Infertile Women for In Vitro Fertilization Treatment in China: A Discrete Choice Experiment

PRESENTER: **Shunping Li**

Objective: Vitro fertilization (IVF) is the primary treatment for infertility, offering a viable pathway to natural conception and full-term pregnancies. However, financial costs, side effects, and treatment inconveniences often result in many women discontinuing IVF prematurely or opting not to pursue it. Addressing these issues could significantly improve patient adherence to treatment protocols and, consequently, enhance the likelihood of successful pregnancies and overall fertility rates. This study aimed to investigate the preferences of Chinese infertile women when selecting in IVF plans. **Methods:** A discrete choice experiment (DCE) was conducted with five key attributes: number of visits per cycle (3 levels), side effects (3 levels), treatment costs per cycle (3 levels), information disclosure about IVF (3 levels), and pregnancy rate per cycle (4 levels). To identify relevant attributes and levels, we adopted a comprehensive approach involving literature review, in-depth interviews (25 patients and clinicians), and expert consultations (5 methodological and medical specialists). D-efficient design was implemented and each task presented two options with an opt-out choice. Twelve choice tasks were generated and divided into two blocks, randomly assigned to respondents. Attribute order within each task was randomized to minimize sequencing effects. Additionally, a “quality control” task was included. The survey was conducted across five hospitals in five provinces of China. Six hundred and fifty participants completed the questionnaire through face-to-face, computer-assisted interviews. Preference weights were estimated using the mixed logit model (MLM). Willingness to pay and relative importance of the attributes were derived from MLM estimates. Additional scenario and heterogeneity analyses were performed. **Results:** A total of 591 participants were included in the final analysis. The mean age was 34.2 years. Over 60% of participants were planning to have their first child, and nearly 75% had undergone IVF-ET treatment. All five attributes were found to be statistically significant. Pregnancy rate per cycle, side effects, and treatment costs per cycle were identified as the top three factors influencing participants’ preferences for IVF. Specifically, an increase in the pregnancy rate from 15% to 60% per cycle corresponded to a 3.63 increase in marginal utility. Participants showed a willingness to pay additional fees to improve non-cost attributes; for example, enhancing the pregnancy rate from 15% to 60% per cycle was associated with a willingness to pay CNY 56,100 (over USD 7,700). Interaction terms involving education level, annual family income, and attribute levels were statistically significant, indicating that these factors contribute to preference heterogeneity. **Conclusion:** The success rate of pregnancy is the foremost factor influencing treatment decisions, with concerns about side effects and treatment costs following closely. Although factors such as the level of information disclosure and the frequency of clinic visits have a lesser impact, they still affect patient decision-making regarding IVF. Additionally, our analysis reveals variability in preferences among different patient subgroups, indicating the need for further research to explore these differences in greater depth.

Ind-1832 Dynamic Preferences for HIV Prevention Among Women and Girls at High-Risk in Nairobi and Kampala: A Longitudinal Discrete Choice Experiment

PRESENTER: **Pitchaya Peach Indravudh**

AUTHORS: Mr. Kenneth Roger Katumba, Laura Lulani, Joelle Mak, Melissa Neuman, Yunia Mayanja, Omu Anzala, Yvonne Machira, Mitzy Gafos, Gabriela Gomez

Background

Effective HIV prevention requires strategies that adapt to the evolving needs and preferences of women and girls at high-risk in endemic settings. Multipurpose prevention technologies (MPTs) combining HIV prevention with other sexual and reproductive health benefits are under development, yet evidence is needed on how user preferences for these products and other prevention services might change over time. This study evaluated dynamic preferences for HIV prevention services including MPTs and assessed the before-and-after impact of product exposure on preferences.

Methods

We conducted a longitudinal discrete choice experiment within a cohort of women and girls at high-risk. Eligibility criteria included HIV-negative adolescent girls and young women (AGYW) in Nairobi and women engaged in sex work (WESW) in Kampala. Cohort participants received integrated services for HIV prevention, including oral pre-exposure prophylaxis (PrEP), and family planning. The DCEs, which were administered at baseline and six months post-enrolment, included 10 choice scenarios with six attributes and three alternatives, including to opt-out. Data analysis used mixed logit models stratified by subgroup and time period.

Results

Baseline and endline DCEs were administered to 233 participants. At baseline, AGYW reported the strongest preferences for post-visit follow-

up from peers and delivery of services through standard health clinics. Demand was also demonstrated for subdermal implants, service provision through pharmacies, trained health care providers, and post-visit follow-up from local community members. AGYW showed disutility for oral pills, combined protection against HIV and unintended pregnancies, service providers who were peers, service delivery through community-based clinics, and follow-up from health care providers. At endline, preferences remained largely consistent, with some observed shifts in the magnitude of preferences. AGYW expressed a measurable preference for service providers from their local community, which they were indifferent to at baseline.

For WESW, preferences at baseline included oral pills, injectables, and combined protection against HIV, sexually transmitted infections, and unintended pregnancies. Dislike was stated for vaginal and transdermal routes of administration, protection against HIV only, and service fees. Strong utility for injectables and disutility for vaginal and transdermal administration and service fees remained at endline. Shifts in the magnitude of preferences were observed for the type of service provider, with participants demonstrating an increased preference for no provider (e.g., dispensary) and a decreased preference for provision from local community members, which they had been indifferent to at baseline.

Conclusion

This DCE provides insights into dynamic preferences to guide delivery of HIV prevention with sexual and reproductive health services as well as development of future MPTs. Our findings revealed that preferences remained largely consistent following exposure to oral PrEP and short and long-acting contraceptive options. While the direction of utility was unlikely to change over a six-month period, some shifts in magnitude were observed. These findings highlight the need for HIV prevention services to consider and remain responsive to stability and variability in user preferences to maximise uptake and effectiveness.

Ind-2015 Preferences for Fertility Support Policies Among Married Women in China: A Discrete Choice Experiment

PRESENTER: **Ms. Yeqing Zhang, PhD Candidate**
AUTHORS: Jue Liu, Ana Correa Ossa, Jie Deng, Wenxin Yan, Stuart Gietel-Basten, Lu Gram

Background

China's fertility rate has been in continuous decline since 2013, despite policy shifts such as the relaxation of the one-child policy in 2015 and the introduction of a three-child policy in 2021. Financial burdens, inadequate childcare support, and career disruptions have been identified as major barriers to women's fertility intention in China. Although the government is considering more comprehensive fertility support policies, little evidence exists on how Chinese women might respond to such policies. We used a discrete choice experiment (DCE) to elicit married Chinese women's preferences for different fertility policy initiatives, with the aim of understanding the potential effectiveness of future fertility policies in the Chinese context.

Methodology

We conducted a single-profile DCE on a randomly selected sample of 1,005 married women aged 27–49 from 31 provinces in China having exactly one child. Participants were randomly assigned to one of three survey blocks, each containing 12 hypothetical policy scenarios. In each scenario, respondents answered on a 6-point scale, ranging from "no intention of having a second child" to "really want a second child." Scenarios varied across five policy attributes: maternity leave, paternity leave, childcare support, monetary incentives, and career progression. The experiment was fielded in the summer of 2024, via Wenjuanxing, an online survey platform.

A mixed ordinal logistic regression model was employed to estimate preference weights for policy attributes and calculate marginal effects of policy change on fertility intentions. Willingness to Pay (WTP) for non-monetary policies was calculated using a bootstrapped method. Additionally, a partial proportional odds model examined how policy preferences differed across intention levels.

Results

All policy attributes are significantly associated with intention to have a second child ($p<0.001$), with career progression having the largest effect, followed by paid maternity and paternity leave, childcare support, and monetary incentives. Compared to a two-year delay on promotions, leaving promotion prospects intact was associated with 5.0 percentage point increase (95% CI 4.4 to 5.6) in intention to have a second child. Extending paternity leave from 0 to 20 days had a greater effect (2.6 pp, 95% CI 2.3 to 3.0) than extending maternity leave from 96 to 156 days (1.8 pp, 95% CI 1.5 to 2.1).

WTP aligned with preference weights, with the implicit WTP for career progression without penalties being 743 RMB per month (95% CI: [673, 814]) over three years, amounting to 26,763 RMB in total. For childcare support, WTP was 229 RMB per month for part-time access and 444 RMB for full-time access, both significantly below market rates.

Heterogeneity analysis showed robustness and suggested women with higher baseline fertility intentions were more responsive to policy changes.

Conclusion

The results highlight the critical role of career protection in fertility decisions. Providing free childcare support was less cost-effective in promoting fertility intentions. Policies promoting gender equity, such as paternity leave, were highly valued. However, overall marginal effects remained modest, suggesting only small shifts are possible under existing policy proposals.

Ind-2407 Donor Preferences for Aid Allocation to Indonesia: a Discrete Choice Experiment

PRESENTER: **Duncan Mortimer**, Monash University
AUTHORS: Jack Hennessy, Rohan Sweeney, Maame Woode

Frequent humanitarian disasters, economic shocks, and a rapidly changing climate suggest that the world's most vulnerable populations will remain reliant on international support for the foreseeable future. The most visible mechanism of providing international support for vulnerable populations is through distribution of development aid, which topped an all-time high of USD 225 billion in 2023. Official development assistance, or aid delivered by governments using funds sourced from taxpayers, is the largest contributor to global international development aid.

In pursuit of the public interest, democratically governed societies might reasonably seek to distribute aid according to population preferences. Previous research suggests that modifiable aspects of aid programs *are* important to members of the general population in donor-countries. Findings from this previous research suggest *inter alia* that distribution based on recipient need may be preferred over distribution in line with cost-effectiveness and that aid should be delivered as in-kind contributions rather than cash. Unfortunately, it remains unclear whether findings from these studies apply to all donor-countries and to all donor-recipient pairs. None of the existing studies describe preferences for allocation of Australia's international development aid.

Using Indonesia as the recipient country setting, we conducted a discrete choice experiment amongst 1,523 Australians aged 18+ to describe preferences for ten characteristics of Australia's health aid program. Contrary to previous studies, we found the effectiveness of aid was the most important characteristic, ahead of the cost of the aid program, the age of the target population, and the size of recipient burden. Respondents preferred highly effective aid targeting younger populations in areas where the burden of disease was high. Recipient government type (*i.e.* highly functioning public service), control of aid (*i.e.* how much influence donors have on projects), target health issue, and the sex of the target population were also significant predictors of preference, but to a lesser extent. Latent class analysis revealed that younger, lower-income individuals were more concerned with recipient characteristics (*e.g.* age, sex) than were older, higher-income individuals who were more concerned with the cost of aid programs.

Our research is the first to quantitatively estimate the Australian public's preferences for aid allocation through a discrete choice experiment and is an essential first step in developing an aid policy that aligns with citizen's views. Our findings appear at odds with Australia's current aid policy, which has moved away from comprehensive, objective measures of aid effectiveness in Government-funded development programs to a policy that prioritises recipient need and broader geopolitical concerns.

Furthermore, while the international aid landscape is dominated by calls for 'locally-led development' and 'decolonisation of aid', our results suggest that Australian donors prefer aid distributed with less recipient control – including aid delivered in pursuit of *donor* (rather than *recipient*) aims and implementation, and aid delivered as technical advice and services rather than delivered as cash.

These findings can be used by governments and international development organisations to better understand how citizen preferences align (or otherwise) with current development priorities, which in turn can be leveraged to underpin support for this much-needed resource.

Ind-2823 Preference Heterogeneity of Online Takeaway Users: A Discrete Choice Experiment

PRESENTER: **Dr. Yuan Yuan Wang, PhD**

Abstract

Background: Consumers are increasingly using online-to-offline (O2O) takeaway apps rather than phone calls to order food from local restaurants. Taste is a significant determinant of food choices. Extensive research has been conducted into taste in the context of restaurants. However, the heterogeneity of online takeaway food preferences is currently unknown, as is whether these preferences are healthy.

Aim: The objective of this study is to address the heterogeneity of taste of O2O takeaway by utilizing a discrete choice experiment (DCE).

Method: A final list of attributes and their levels for the DCE was generated using a detailed iterative process. This included a literature review, six focus group with those O2O takeaway users. From this process a list of attributes was obtained. Following a three pilot studies, the final list of attributes was selected (meal types, price, online reviews and delivery time). We used D-efficient design to construct an experimental design for the survey. The survey consisted 24 choice cards with three alternatives and one non-option. To evaluate the heterogeneity of taste for O2O takeaways, a latent class model (LCM) is employed. China is the biggest O2O takeaway market in the world. Thus, the model was applied using data from a DCE with a representative sample of 484 individuals aged between 18 and 40, drawn from ten cities in China. All best-sell 48 meals were collected from China O2O takeaway apps.

Results: Our model identified three classes of online takeaway users, with an 'Affluent' class (57.82%), a 'Taste-driven' class (26.9%), and a 'Money saver' Class (15.2%). The 'Affluent' class is comprised of affluent individuals who frequently consume takeaway food. These individuals tend to order heavy and very heavy meals and pay attention to diet control. The 'Taste-driven' class is characterized by a preference for taste, with takeaway orders occurring three or more times a week. This group also exhibits a preference for heavy or very heavy meals and a tendency to consume meals with a higher salt content compared with affluent class. Compared with other two classes, the 'Money saver' class is characterized by lower incomes, a lower frequency of takeaway consumption, less attention paid to dietary control, and a greater propensity to order high-calorie dishes. The study identified a group of takeaway users who are motivated by financial considerations. It is noteworthy that the study revealed that O2O takeaway users do not always make optimal decisions regarding their daily takeaway food. Individuals who regularly order takeaways and primarily consume very heavy and heavy meals are at an elevated risk of obesity. Furthermore, they tend to select less healthy options, including takeaways with high fat, high carbohydrate, and high salt content.

Conclusions and Implications: These findings indicate that policymakers may consider the utilization of nudging intervention tools with the objective of encouraging consumers to make healthier O2O takeaway food choices. Policies targeting unhealthy foods could prove beneficial for 84.72% members of the 'affluent' and 'taste-driven' social classes by providing nutritional information on online takeaway menus, thus reducing excess energy intake.

Ind-1329 Understanding Public Preferences and Willingness to Pay for Seasonal Influenza Vaccines in India: Insights from a Discrete Choice Experiment

PRESENTER: **Jeffrey Pradeep Raj**
AUTHOR: Yashika Nandkumar Zagade

Introduction: Seasonal influenza poses a significant global health threat, with 3–5 million severe cases and 290,000–650,000 deaths annually. Vulnerable groups in low- and middle-income countries (LMICs), such as pregnant women, infants, and those with chronic conditions, face higher risks due to limited healthcare access. Africa and Southeast Asia account for 51% of global influenza deaths, with rates 1.4 times higher than in high-income countries. Vaccination, while not foolproof, effectively reduces severity, complications, and mortality. Yet, coverage remains under 1% in Africa and Asia. Hence, identifying vaccine attributes valued by the public is key to boosting uptake. A discrete choice experiment (DCE) is a useful way to understand what influences people's choices—in this case, for an influenza vaccine. It breaks preferences into key features, like safety, effectiveness, and cost, with each feature having different levels, such as effectiveness at 40%, 60%, or 80%. By examining how people prioritize these factors, a DCE reveals their preferences and decision-making patterns. *Methods*: A statewide digital survey was conducted in Maharashtra, India from January to May 2023, targeting adults over 18 years who had lived in the country for at least six months. The DCE presented participants with seven pairs of hypothetical influenza vaccines, including a "trap question" where one option was clearly superior. Respondents failing the trap question were excluded. Each vaccine was described using key features—effectiveness, side effects, route of administration, duration of protection, and cost—with varying levels for each attribute across the pairs. *Results*: A total of 2146 respondents consented, of which 146 were screen failed, 148 failed the trap question and 1852 responses were finally analysed. The most important attributes were effectiveness followed by side effect profile. The respondents were willing to spend approximately INR2607 (31·03USD), and INR3538 (42.12USD) per dose to take vaccines that offer 60% and 80% effectiveness, respectively (relative to 40% protection). With regards to side effects, they were willing to pay an additional money of INR 1422 (16.93USD) and INR 1506 (17.93USD) on vaccines with either no side effects or minimal local effects, respectively (relative to a vaccine that causes systemic side effects). Vaccine hesitancy (to at least 3/6 vaccine pairs) was seen in 9.01% *Conclusions:* This study highlights effectiveness and side effect profile as key attributes influencing vaccine preferences in India. Respondents demonstrated a willingness to pay higher for vaccines with greater effectiveness and fewer side effects. Despite these preferences, vaccine hesitancy persists in a small segment despite an ongoing influenza epidemic in India. These findings can guide strategies to improve influenza vaccine uptake.

10:30 AM –12:00 PM MONDAY [Health Beyond The Health System]

Bali International Convention Centre – Bali

Social Gradients and Social Security - Impacts Beyond the Healthcare System

MODERATOR: **Marshall Makate**,

Ind-919 Social Determinants of Health and Diabetes Self-Care Management in South Africa.

PRESENTER: **Assegid Hellebo**
AUTHORS: Sue Cleary, Andre Pascal Kengne, Amarech Obse, Olufunke Alaba, Bronwyn Myers, Naomi Levitt

Background Diabetes affects around 4.2 million South Africans aged 20-79, leading to complications, premature morbidity, and strain on healthcare systems. Effective self-care management is key to preventing these adverse effects and reducing negative economic impact. However, Social Determinants of Health (SDoH), including socioeconomic and environmental factors, often hinder adequate self-care and adherence to treatment. This study explored the relationship between SDoH and diabetes self-care management, using the Healthy People 2020 (HP2020) framework to examine how these social factors influence adherence to self-care practices among individuals with diabetes in South Africa. **Method** This cross-sectional study utilized baseline data from Project Mind, collected in 2017. Self-care management was coded on a scale from '0' (never) to '7' (daily adherence). For analysis, the scale was dichotomized into two categories: low self-care (scores 0–5) and high self-care (scores 6–7). Additionally, adherence to daily self-care activities was categorized into three levels: no adherence, partial adherence (inconsistent or partial adherence), and full adherence (consistent adherence to all self-care activities). The study analysed the associations between socio-demographic factors (such as age, gender, education), economic conditions, lifestyle factors (including obesity and food insecurity), and access to healthcare services with self-care practices among individuals with diabetes. **Results** The analytical sample (n=539) was predominantly female (76%), with a mean age of 54 years. Participants were mostly urban residents (60%), unemployed (70%), and had attained secondary education (11.3%). Age (AOR=1.02, CI=[0.99, 1.05]) and secondary education (AOR=1.13, CI=[1.02, 2.03]) were positively associated with higher levels of self-care. In contrast, urban residency (AOR=0.50, CI=[0.29, 0.88]) and obesity (AOR=0.43, CI=[0.19, 1.00]) were linked to lower self-care adherence. Though not statistically significant, food insecurity (showing a decreasing association), being a woman, and having a stable home were found to influence self-care practices. Longer travel distances to healthcare services were positively associated with poor adherence, and urban residency was negatively associated with full adherence compared to partial adherence. **Conclusions:** The study highlights the significant role of SDoH in shaping diabetes self-care management in South Africa. The findings underscore the need for more holistic, tailored interventions that address the socio-demographic, economic, and environmental factors affecting self-care practices aimed to improve diabetes management and health outcomes. Future research should explore these determinants in

greater depth and develop integrated strategies to enhance self-care and overall health outcomes for people with diabetes in South Africa. **Keywords:** Social Determinants of Health, Diabetes, Self-care Management, Adherence, South Africa, Healthy People 2020, Socioeconomic Factors, SDOH, Health Inequities 1

Ind-1099 The Impact of Social Determinants on Anxiety Levels Among the Elderly During the Pandemic

PRESENTER: **Ziyan Zhang**
AUTHORS: Wenbin Liu, Qiwen Deng

Background The COVID-19 pandemic poses significant threats to health and life, leading to economic instability and increased living stress, which triggers widespread emotional and psychological challenges. Existing studies have shown that anxiety levels in the elderly are influenced by multiple factors, including social isolation, chronic disease burden, economic pressures, and lifestyle changes. Gender and educational attainment are widely recognized as critical social determinants of mental health. Elderly people with chronic diseases face heightened health risks, resulting in anxiety levels significantly higher than other age groups. However, most studies focus on the acute phase of the pandemic, and there is a lack of systematic exploration into the long-term impact on elderly anxiety, research on social support and policy interventions exists, empirical studies on designing more targeted mental health interventions remain scarce. **Methods** This study is based on the Social Determinants of Health (SDOH) theory. In this study, we uses data from the 2020 China Health and Retirement Longitudinal Study(CHARLS).with a final sample of 7139 respondents after cleaning. Structural equation modelling (SEM) approaches were employed to analyze the relationship between social determinants and anxiety levels among the elderly, focusing on several variables such as gender, educational attainment, and disease prevention awareness. Descriptive statistics and multiple linear regression analyses were conducted using Stata to summarized the characteristics of the sample and examine the correlation between factors. **Results** The results show that gender is a significant factor influencing anxiety levels (path coefficient = -0.2341, $p < 0.001$), with women exhibiting significantly higher anxiety levels than men. Additionally, there is a significant negative correlation between educational attainment and the level of anxiety(path coefficient = -0.0538, $p = 0.005$), indicating that higher levels of education are associated with lower levels of anxiety. Additionally, the impact of disease prevention awareness on anxiety is relatively weak but still positive (path coefficient = 0.0378, $p < 0.05$). Individuals with greater disease prevention awareness exhibited higher anxiety levels, this may be due to the diverse and complex information received during the pandemic, excessive exposure to negative information may heighten awareness but also exacerbate anxiety. The regression results indicate that higher disease prevention awareness and lower education levels significantly increase anxiety, while gender differences also play a crucial role. **Conclusion** Using pandemic-related data, this study reveals the social determinants of elderly anxiety levels and their complex mechanisms during public health emergencies. It highlights the significant effects of gender differences, and educational attainment on anxiety, while systematically exploring the key factors affecting the mental health of the elderly in the later stages of the pandemic. The findings address gaps in the existing literature regarding the long-term impacts and interaction mechanisms of these variables. They provide empirical support for developing more targeted mental health interventions for the elderly, offer new perspectives on building social support networks and improving health equity, and serve as a robust foundation for formulating public health policies. **Keywords** Social Determinants Anxiety Levels Elderly

Ind-1210 Quantifying the Social Capital Burden due to Cardiovascular Disease: Implications for Outcome Measurement

PRESENTER: **Anthony Niu**
AUTHORS: Dieu Nguyen, Peter Lee, Lan Gao

Objectives

This study examines the associations between **cardiovascular diseases (CVD)** and self-reported **social capital** among older individuals (aged 50 and above) in Australia. Leveraging the longitudinal richness of a nationally representative survey dataset, this study aims to make three novel contributions to the health economics literature. First, the study investigates potential **CVD gradients** in social capital by categorising individuals into three groups: those without CVD, those with CVD but no medication, and those with CVD regularly taking prescription medication. Second, it compares the impacts of three specific types of CVD - **heart disease (HD)**, **high blood pressure (HBP) and hypertension**, and **other circulatory conditions (OCC)** (e.g., stroke or hardening of the arteries. Third, it distinguishes between two dimensions of social capital: **cognitive social capital**, reflecting emotional aspects like social support and loneliness (e.g., “I often feel very lonely”), and **structural social capital**, reflecting participation in social networks and civil communities (e.g., “I make time to keep in touch with friends”).

Methods

This study utilises data from four waves of the **Household, Income and Labour Dynamics in Australia (HILDA)** survey - 2009, 2013, 2017, and 2021 - providing a total of **26,364 individual-year observations** from **10,205 unique respondents**. Both measures of social capital - cognitive and structural - were constructed using responses to a series of questions from the HILDA Self-Completed Questionnaires (SCQs). **Factor analysis** techniques were applied to derive two index outcomes for each measure: social support and loneliness for cognitive capital, and civil participation and social engagement for structural capital. These indexes were standardised with a mean of 0 and a standard deviation (SD) of 1 to enable consistent comparisons. To account for potential biases arising from unobserved individual-specific characteristics (e.g., childhood experiences), the analysis employs two econometric methods. First, a **Correlated Random-Effects (CRE)** Model (Mundlak approach) was used to control for within- and between-individual variations while preserving time-invariant covariates. Second, a **Dynamic Model** with a lagged dependent variable (t-1) was employed to capture temporal effects and the persistence of social capital outcomes over time.

Results

The CRE results show that individuals with CVD requiring prescription medications report significantly worse social capital outcomes. They experience a 0.174 SD (P < .001) higher loneliness index, and a 0.064 and 0.073 SD lower civil participation and social engagement, respectively, compared to those without CVD. Among CVD types, OCC (e.g., stroke) have the largest impacts, increasing loneliness by 0.225 SD and decreasing social engagement by 0.210 SD. Female respondents with HD and medication dependence report the highest loneliness levels (0.300 SD higher, P < .001), while no significant differences are observed by age, immigration status or geographic location.

Conclusions

This research addresses critical gaps in understanding the broader social and economic burden of chronic diseases in Australia, offering insights into how CVD shapes both individual well-being and societal connectedness. This will stimulate discussion around the outcome measure selection in CVD population. A quality-of-life instrument that lacks the dimension of social capital may lead to sub-optimal measurement of the benefit.

Ind-1576 Wealth Gradients in Mortality and Morbidity: Heterogeneity in Ecuador during COVID-19 and Beyond

PRESENTER: **Omar Galarraga**, Brown University

Background: Wealth gradients for mortality have been described in high income countries since the 19th century. Documented gradients by cause of death are less common in low- and middle-income countries, particularly during and after COVID-19.

Research Questions: Are there mortality wealth gradients in Ecuador? If so, are there differential patterns by cause of death? Are there gradients for morbidity? If so, do social health insurance and pension fund availability reduce disparities? Are there differences by race/ethnicity self-identification?

Methods: Data come from the complete 2022 Census for Ecuador with N=16,938,986 individual observations. All-cause mortality is the dependent variable as well as mortality by three large groups of causes: (i) Violent deaths (accidental, suicide, assassinations); (ii) COVID-19; (iii) other causes (other diseases, natural causes). Reported permanent functional disability is the secondary dependent variable; measured as a composite index from Likert-scale responses to permanent difficulty with activities of daily living (walking, bathing, etc.), as well as difficulty with hearing, vision, speech and/or concentration. The main independent variable is rank of households as measured by their relative position by a wealth index constructed with principal components analysis of 28 variables (including house ownership, house construction materials, persons per room, ownership of various assets). Concentration curves and concentration indices are used to characterize relative inequality; specifically, the Erreygers standardized index is used for mortality.

Results: There were 237,382 households reporting at least one death during the prior three years (starting on January 1, 2020). This implies that 4.57% of the total 5,193,548 households reported at least one death. Of all deaths, 9.3% are violent, 18.8% are due to COVID-19, and 71.9% are due to other causes. A total of 6.7% of individuals report permanent functional disability. There was no negative gradient for overall deaths, nor for COVID-related deaths, nor differences by self-identified Indigenous status. However, violent deaths exhibited a strong and significant negative gradient; the Erreygers index was -0.0664 [SE: .001, p-value=0.000], and yet contrasting differences by social health insurance status was not significant [p-value: 0.11]. Permanent functional disability was also concentrated among the least wealthy; the concentration index was -0.022 [SE:.00006, p-value: 0.000] and presence of social health insurance / social security at the household level reduced disparities in functional disability [from -0.022 to -0.018, p-value=0.000].

Conclusions and implications for policy: This presentation documents negative gradients in violent deaths and permanent functional disability in Ecuador. The current social health insurance and pension fund system does not seem to help to reduce the disparities in deaths related to accidents, murder, and suicides; however, it seems to reduce disparities for functional disability. The lack of observed gradients in COVID-19 deaths, particularly among Indigenous people, may be because of poor access to testing and diagnosis prior to death. The public system (of social health insurance and pension fund) may need to be reformed to better address emergency care as well as mental health so that it becomes more progressive and provide better protection against violent-deaths mortality, particularly for the lower economic echelons.

Ind-992 Potentially Modifiable Lifestyle Factors and Cognitive Impairment Risk Among Older Adults with Hypertension: A Community-Based Study

PRESENTER: **Mingze Ma**
AUTHOR: Jian Wu

Background The epidemiology of cognitive impairment has paid little attention to the older adults with hypertension in rural and urban China, and the association of comprehensive lifestyle factors with cognitive impairment has rarely been investigated. **Objectives** To investigate the prevalence of cognitive impairment and its association with potentially modifiable lifestyle factors among older adults with hypertension in rural and urban communities in China, aiming to identify high-risk individuals and promote targeted health strategies for maintaining cognitive health. **Methods** A cross-sectional study involving 18,963 hypertensive individuals aged 65 years and older from 15 communities (2 urban and 13 rural) in Jia County, Henan Province, China, was conducted from July to August 2023 via a cluster sampling method. Cognitive impairment was assessed via the Mini-Mental State Examination (MMSE), with thresholds on the basis of education level. Logistic regression models were used to assess the associations of sociodemographic information, eight lifestyle factors, and clinical physiological and biochemical indicators with cognitive impairment. **Results** Cognitive impairment was prevalent in 33.6% of the older adults with hypertension, with a higher prevalence in females (35.4%) compared to males (31.1%), and showed an age-dependent increase. The adjusted odds ratio of cognitive impairment was 0.76 (95% confidence interval(CI), 0.60-0.95) for alcohol consumption, 0.62(95%CI 0.56-0.68) for adequate physical activity, 0.85 (95%CI 0.78-0.92) for a healthy diet, 0.85(95%CI 0.78-0.93) for 7-8 hours of sleep, 1.38 (95%CI 1.22-1.55) for depression, 1.36 (95%CI 1.20-1.54) for anxiety, and 0.63(95%CI 0.58-0.69) for high social participation. Higher composite healthy lifestyle scores were associated with

a significantly lower risk of cognitive impairment(p<0.001). Compared to participants with the lowest scores, those with the highest scores for a healthy lifestyle had their risk of cognitive impairment reduced to 0.30 (95%CI 0.25-0.38). **Conclusions** Our research revealed that the prevalence of cognitive impairment was high and increased with age among the older adults with hypertension in rural and urban China, regardless of sex differences. Potentially modifiable healthy lifestyle factors (e.g., alcohol consumption, adequate physical activity, healthy diet, sufficient sleep, good mental health (absence of depression or anxiety), and high social participation) were all negatively associated with cognitive impairment. Increases in healthy lifestyle scores were strongly correlated with a reduced risk of cognitive impairment. These findings support promoting healthy lifestyles to maintain cognitive health later in life. This composite healthy lifestyle score can help identify high-risk individuals with cognitive impairment, leading to more targeted health promotion strategies. This will improve the overall cognitive health and quality of life of older adults with hypertension and provide significant long-term public health benefits to the community. **Keywords** Ageing; Hypertension; Community; Cognitive function; Lifestyle factor; Healthy lifestyle score.

Ind-1061 Does Work from Home Contribute to Increased BMI and Obesity?

PRESENTER: **Anastasia Semykina**
AUTHOR: Brenda Gannon

As a by-product of COVID-19 pandemic, the world had discovered work from home (WFH) as a viable and acceptable strategy to engage in the workforce. Even after the pandemic was officially over, all restrictions were lifted, and COVID-related health concerns substantially diminished, WFH persisted beyond pre-pandemic levels, and hybrid work became a more widely accepted and popular option. Recent studies find that WFH has no detrimental impact on productivity and improves the worker job and life satisfaction, suggesting that WFH may be a win-win for both employers and employees. However, some researchers voiced concerns about possible adverse mental health consequences of social isolation when staying at home. A few studies also considered changes in individual body weight during the pandemic, but the impact of WFH on body weight outside of the pandemic period has not been explored. The freed-up time from a decreased commute opens a possibility of devoting more attention to health, increasing the frequency of exercise and cooking meals at home. On the other hand, the sedentary nature of most jobs done from home may result in less physical activity and unhealthy lifestyle choices. The present paper studies the effects of WFH arrangements on health by considering the person's body mass index (BMI) and obesity before and after the COVID-19 pandemic.

We explore the relationship between WFH and workers' body weight using panel data from the Household, Income and Labour Dynamics in Australia Survey, years 2006-2019, 2022-2023 – a nationally representative dataset. Estimation is performed using a two-way fixed effects linear model, which accounts for unobserved individual characteristics, such as genetics, chronic health conditions, and family background. The analysis is performed separately for men and women and for pre- and post-COVID periods.

We find that prior to COVID, the intermediate WFH intensity (50 to 70% hours worked at home) among women is associated with about 0.4 higher BMI and 10 percentage points higher probability of obesity as compared to women with zero WFH. The effects are stronger for women in office jobs. During the post-pandemic period, the likelihood of obesity is approximately 6 percentage points higher for women with high WFH arrangements (70% or more hours worked at home). There are no systematic effects for men.

To explore the potential mechanisms, we study the link between WFH and physical activity, time use and diet using the two-way fixed-effects analysis. Our results indicate that women with intermediate WFH tended to have less healthy diets and spent less time on physically active home tasks during the pre-COVID period. On the other hand, women with high WFH were less physically active than women with intermediate WFH after the pandemic. Furthermore, the share of WFH workers in office jobs has increased after the pandemic.

These findings suggest that staying physically active while working at home can help to avoid the unhealthy weight gain. Hence, informational interventions highlighting the importance of exercise and healthy foods might be warranted.

Ind-1412 Impact Of Conditional Cash Transfers On Adolescent Pregnancy: Evidence From Colombia

PRESENTER: **Ana Correa Ossa**
AUTHORS: Lara Gosce, Neha Batura, Jolene Skordis

Background and research aim Latin America and the Caribbean have the second-highest adolescent pregnancy rates globally (Aguía-Rojas et al., 2020). Colombia ranks among the highest in the region, with nearly one in five adolescent girls having been pregnant, rising to one in three among the poorest and in areas with large Afro-descendant, indigenous, or displaced populations. (Daniels, 2015; Gimenez et al., 2015). Conditional cash transfers (CCTs), such as Colombia's *Familias en Acción*, provide a monetary stipend conditional on school attendance, potentially reducing adolescent pregnancy by improving economic and educational opportunities (Ribas et al., 2021). Evidence on their effectiveness remains limited, particularly for younger adolescents and across rural/urban settings (Ribas et al., 2021). This research aims to evaluate the impact of *Familias en Acción* on adolescent pregnancy in Colombia, disaggregating results by age group and rural/urban setting. **Methods** We used *Familias en Acción* beneficiary data and Colombian census data to create a treatment variable, representing beneficiary density, continuous from 0 to 1, for three adolescent girl groups (ages 10-14, 15-19, and 10-19). Adolescent pregnancy rates, disaggregated by age, were sourced from the Colombian Ministry of Health. Covariates included municipality-level data on rural/urban category, annual income per capita, and adolescent girls' population size for each age group. The panel dataset covered 1,101 municipalities from 2008 to 2017 (10,913 observations). A two-way fixed effects model with lags of up to 4 years was used, following a recent study exploring the impact of Mexico's PROGRESA on adolescent pregnancy rates (Parker et al., 2023). Results were estimated separately by age group and rural/urban category. **Results**Full sample results show sustained and significant reduction in adolescent pregnancy for all age groups, up to 4 years after beneficiary increase. There is an increasing trend as time from treatment increases. The largest effects were seen for girls aged 10-14 (3 years post beneficiary increase), who had almost a five-fold reduction of the national mean rate for this age group. There was significant heterogeneity of results depending on rural/urban location, with most reductions seen in urban and peri-urban settings. **Discussion** These impacts may stem from the CCT increasing school enrolment (Attanasio et al., 2006, 2010), reducing economic vulnerability (Tovar et al., 2017), and increasing health knowledge (Llano et al., 2014) among beneficiaries; all of which can contribute to reduced adolescent pregnancy rates. Findings align with prior literature showing stronger programme impacts in urban and peri-urban areas

(Cortes et al., 2016; Attanasio et al., 2021). The significant reductions among girls aged 10–14 are particularly noteworthy, as this group faces greater risks of mortality, morbidity, and disrupted education. The mostly null results in rural areas show that the CCT impact may be diminished due to limited access to relevant sexual health services. Further research could focus on identifying the mechanism of action, helping develop effective integrated strategies to address adolescent pregnancy.

Ind-1498 Maternal and Child Health Impacts of Integrated Social Safety Nets: Cash Transfers, Information Meetings, and Home Visits

PRESENTER: **Damien de Walque**, The World Bank
AUTHORS: Harounan Kazianga, Richard Akresh, Abigail Stocker

For over 25 years, governments in developing countries have used cash transfers delivered to poor households to help children reach their full potential in terms of health, education and psychosocial development. More recently, integrated programs combining either information or home visits have been adopted and added to cash transfers to help households overcome barriers to improving maternal and child health and child development.

Working with the Burkina Faso government, we conduct a cluster-randomized experiment in 225 rural villages to assess the impact on maternal and child health of an integrated social safety net over the child's life cycle. Villages were randomized to a control group or one of the 3 following treatments: 1) cash transfers; 2) cash transfers plus government-run information meetings focused on children's health and psychosocial development; or 3) cash transfers, information, and home visits reinforcing the information meetings.

Fifteen months after the treatment ended, results indicate that households receiving the combined full intervention have lower fertility, increased age at each pregnancy, increased use of medical care at birth, prenatal care visits, bed nets usage and handwashing as well as improved child anthropometrics. The home visit component is critical for improving early childhood development indicators. Cash transfers alone, with or without village-level information meetings do not impact these outcomes.

This study makes three main policy relevant contributions. First, this is the first study to compare in the same setting, interventions that provide only cash, cash plus information, or cash plus information plus home visits. Existing evidence shows that each component (cash, information, and home visits) could lead to improved maternal and child health, but it is not clear where the behavioral constraints lie and whether removing all these barriers leads to larger impacts. Given that many governments in developing countries are considering adopting home visits as part of their social safety nets, it is also important to understand why home visits work and whether they are necessary or if simply providing cash or knowledge is sufficient.

Second, due to insecurity in parts of Burkina Faso, the endline survey was delayed by approximately 15 months after the treatment intervention ended. Therefore, all our program impacts should be interpreted as the medium-term effects once the program ended. There are a limited number of evaluations that can look at impacts beyond the program ending and given that the previously discussed literature found maternal and child health impacts disappeared or faded out, it is therefore promising that we still are able to observe positive impacts of the full treatment intervention 15 months after the program ended.

Third, while it was not the intention of the Burkina Faso government to be evaluating this social safety net in an environment with insecurity and conflict, those factors did present themselves and allow us to contribute to a very limited literature looking at the role of social safety nets in conflict settings. Our setting also allows us to examine whether the interventions, or specific components, had different effects on more vulnerable households.

Ind-2209 Do Social Protection Programmes Mitigate Health Shock Vulnerability to Poverty in Sub-Saharan Africa?: Empirical Lessons from Nigeria

PRESENTER: **Adelakun Odunyemi**
AUTHORS: Khurshid Alam, Hamid Sohrabi

Background: Health shocks are increasingly driving vulnerability to poverty in Sub-Saharan Africa (SSA). However, studies on the mitigating impacts of social protection mechanisms on induced vulnerability to poverty are sparse and inconclusive. Apart from very few studies on health insurance, the few studies on health-related vulnerability to poverty in SSA rarely assessed the role of social protection mechanisms.

Therefore, this study assessed the impact of health shocks on vulnerability to poverty in a nuanced manner, the mitigating role of social protection programmes and their rural-urban disparities in Nigeria as a microsome of reality in SSA. Moreover, the study provides valuable insights into geographical inequality in the dynamics of health shocks and social protection mechanisms, which is crucial for informing policy interventions to reduce rural-urban inequalities.

Methods: We used large and most recent nationally representative Nigeria Living Standards Survey data, Chaudhuri's vulnerability as expected poverty (VEP) and three-stage Feasible Generalized Least Squares proposed by Amemiya (1977) to estimate vulnerability to poverty. We classified households into poverty dynamic categories, using their current poverty status and risk of (future) vulnerability to poverty: persistent poverty (current poverty and poverty vulnerability), transient poverty (current poverty but no poverty vulnerability), potential poverty (no current poverty but poverty vulnerability), and poverty escapes (no current poverty and no poverty vulnerability). We employed multinomial probit regression to analyse the impact of health shock and social protection programmes on these dynamics. This classification offers a nuanced understanding of the heterogeneous and dynamic nature of poverty beyond the simple vulnerability commonly found in the literature.

Results: Our findings reveal that 32% of households were vulnerable to poverty, with 23.3% experiencing persistent poverty and 16.8% facing

potential poverty. Death/disability of income-earning household members, non-communicable diseases and malaria substantially increased vulnerability to poverty (more than 20% likelihood), mainly persistent and potential poverty. Rural households were more vulnerable than their urban counterparts across all poverty categories.

Social protection mechanisms showed mixed effects. While safety net coverage was associated with increased poverty, enrolment into the National Health Insurance Scheme and receipt of remittances significantly reduced (> 80%) the likelihood of potential and persistent poverty. However, coverage of these programmes remains low, particularly in rural areas.

Conclusion: These findings underscore the need for policies targeting health shocks and improved and adequate social protection programmes to reduce poverty from health shocks in SSA, especially in rural areas. This study provides compelling evidence that the implementation of social safety net programmes in SSA requires review to position them effectively to combat poverty.

10:30 AM –12:00 PM MONDAY [Health Care Financing & Expenditures]

Bali International Convention Centre – Denpasar B

Cost of Healthcare Seeking and Service Delivery

MODERATOR: **Mardiati Nadjib**, InaHTAC

Ind-387 Examining Disparities in Maternal Health Care Costs Among Scheduled Tribes in Odisha and Jharkhand States in India

PRESENTER: **Rekha S**

Background: Illness often plunges households into poverty due to substantial out-of-pocket expenses (OOPE) and indirect costs like loss of income or employment. Evidence from the existing literature indicates that catastrophic health spending is incurred for general health care and maternal health services. The findings from studies specify that women belonging to particular social groups, rural households, who are less educated and poor, incur delivery costs which are catastrophic, and these further push them into poverty

Methodology: The analysis uses data from the National Family Health Survey (NFHS) rounds 4 (2015-16) and 5 (2019-21). A multivariable linear regression identifies the effects of selected socio-economic variables on OOPE in both public and private healthcare facilities. The Concentration Index (CI) and curves are used to measure inequality in OOPE within ST groups. To analyse the nature of OOPE, we use the Kakwani Index (KI) is employed.

Results: The multilinear regression analysis reveals a positive correlation between wealth and OOPE in India, suggesting higher OOPE with increasing wealth. In Odisha, the CI values for OOPE in public health facilities are positive in both NFHS-4 and NFHS-5, indicating that a larger share of OOPE is incurred by women from wealthier quintiles. However, there is a marginal reduction of 0.21 percentage points (p.p.) in CI values from NFHS-4 to NFHS-5. In contrast, for private healthcare facilities, the CI was negative in NFHS-4, signifying that poorer women bore a greater OOPE burden. By NFHS-5, the CI turned positive, indicating a shift in the OOPE burden toward wealthier individuals, with an increase of 0.9 p.p. In Jharkhand, the CI values for OOPE in both public and private health facilities are positive across both rounds of the NFHS. In public facilities, the CI increased by 0.3 p.p. from NFHS-4 to NFHS-5, showing a greater concentration of OOPE among wealthier quintiles over time. For private facilities, there was a slight decrease of 0.1 p.p. in CI values between the two rounds, indicating a small redistribution of OOPE burden among wealth quintiles.

In Odisha, the KI for OOPE in public health facilities in NFHS-4 (2015-16) was positive (0.12), indicating progressivity, but in NFHS-5 (2019-21), it became negative (-0.056), indicating regressivity. In private facilities, the KI was consistently negative (-0.97 in NFHS-4 and -0.06 in NFHS-5), highlighting a regressive burden, with poorer individuals bearing a larger income proportion in OOPE. In Jharkhand, the KI for public health facility costs was positive in both surveys (0.18 and 0.58), showing progressivity, while private facility costs consistently showed regressivity (KI of -0.12 in NFHS-4 and -0.10 in NFHS-5).

Conclusion and Discussion: The findings of the study indicate that ST women with lower incomes face a disproportionately high OOPE burden compared to wealthier groups, specifically with respect to private-sector delivery care costs, showing strong regressivity. To mitigate this financial strain, we recommend targeted financial assistance programs, improved monitoring, and strengthened public healthcare infrastructure in ST regions. These measures would promote equitable maternal healthcare access and reduce the economic burden on ST women.

Ind-1003 The Long-term Health System Costs of Adverse Perinatal Outcomes in Northern Territory, Australia: A Two-Decade population-based study

PRESENTER: **Tsegaye Haile**

AUTHORS: Richard Norman, Gizachew A. Tessema, Gavin Pereira

Background: The economic burden of adverse perinatal outcomes—including preterm birth, small-for-gestational age (SGA), low birthweight (LBW), and mortality (including stillbirth)—on individuals, families, societies, and health systems remains a prevailing issue in Northern Australia. The burden spans from healthcare costs to family psychological challenges, extends into adulthood and may result in significant economic losses later in life. Despite its importance, this issue has received limited attention. Therefore, we examined the incidence,

hospitalisations, and emergency department (ED) presentations associated with these outcomes, analysing the related healthcare costs up to age five from a health system perspective. **Methods:** We used a retrospective cohort study of births from July 1, 2000, to December 31, 2020, linked to hospitalisation, ED presentation, and cost-weight data. The healthcare cost measurement was conducted from a health system perspective, encompassing both direct medical and non-medical costs. Cost trends were examined by year from 2000 to 2020 and across the childhood period from birth to age five years. All costs were standardised to Australian dollars (A$, as of June 2024). To identify the drivers of cost, we used a Generalized Additive Model (GAM) with a gamma distribution and log link function. Model fitness and comparisons were assessed using the Akaike Information Criterion (AIC) and Restricted Maximum Likelihood (REML). Thin plate and cubic spline terms were employed to capture the smooth, non-linear relationships between cost and covariates. **Results**: We found 87.5 preterm births/1,000 live births, 123.9 SGA/1,000 live births, 77.9 LBW/1,000 live births and 6.5 stillbirth/1,000 total births. The hospitalisation and ED presentation rates among preterm children were 2.4 and 4.9 per child year. The mean cost of hospitalisation and ED presentation was A$10,435 (A$10,086) and A$816(A$305) per preterm child, respectively, in the first five years of life. We also found that mean hospitalisation cost of A$7,294(A$5,765) and A$774(A$297) cost of ED presentation per a child with SGA, in the first five years. We observed higher costs of hospitalisations and ED presentations in later cohorts, while individual costs decreased as the child aged. Child-related clinical characteristics and length of hospital stay were the main drivers of combined costs. **Conclusions**: The substantial financial burden of adverse perinatal outcomes impose on the healthcare system is largely driven by extended hospital stays at birth and at subsequent admissions. Vulnerable populations, particularly children from indigenous parents and those in remote areas have significantly higher healthcare costs relative to the average. These findings underscore the need for further research to quantify the disparity and identify the underlying contributors, enabling more targeted interventions to reduce the dual health and economic impacts driven by these vulnerable populations.

Ind-1279 Estimating the Financial Burden of Cancer in Nepal: A Cross-sectional Study of Patient Costs

PRESENTER: **Pratik Khanal**
AUTHORS: Krishna Kumar Aryal, Kjell Arne Johansson, Biraj Karmacharya, Shiva Raj Adhikari, Achyut Raj Pandey, Ravi Mishra

Background Estimating financial burden on patients with cancer is crucial for the evaluation of national cancer programs and policies. However, there is a dearth of comprehensive research on the costs associated with cancer care in low-resource settings. Additionally, the financial protection provided by existing social health protection schemes remains largely unexplored. This gap in evidence may hinder policy makers from designing effective financial protection mechanisms and prioritizing cancer interventions within national health benefit packages. **Aim** This study aims to estimate the financial burden of cancer in Nepal from the patient's perspective. We estimated the annual cost of cancer care and catastrophic health expenditure (CHE) among patients seeking cancer treatment . **Methods** This cross-sectional study was conducted in two tertiary public cancer hospitals of Nepal. Face-to-face interviews were conducted with 353 patients undergoing treatment for five cancers. To estimate the annual cost of cancer, we calculated and summed up annual direct medical, direct non-medical and indirect costs. The incidence of CHE was measured as the proportion of households whose out-of-pocket payments for cancer treatment exceeds 10 and 25 percent thresholds of annual household expenditure. A generalized linear model was used to identify the predictors of annual cost, while a multivariable logistic regression model was used to assess the determinants of CHE. **Results** Overall, 58.6% of the patients were members of at least one social health protection scheme and 81.6% had utilized treatment subsidies for cancer (a separate subsidy for chronic diseases). The annual average cost of cancer care was estimated at 3687 United States Dollar (USD). Direct medical costs constituted the largest proportion of the total cost (53.8 %), while indirect costs and direct non-medical costs accounted for 30.5% and 15.7% of the total cost, respectively. Factors significantly associated with higher annual cancer costs included longer duration of treatment, combined treatment modalities, admission to inpatient care, and prior visits to the private health facilities. At the 10% threshold, the overall incidence of CHE was 96.9%, with 98.6% in the poorest and 91.5% in the richest quintile experiencing CHE. Similarly, at the 25% threshold, 83.9% of the patients experienced CHE with 98.6% in the lowest quintile, and 59.2% in the highest wealth quintiles affected. Factors significantly associated with higher odds of CHE included treatment duration of 6-12 months (compared to less than 6 months), admission to inpatient care, and those in the lower wealth quintiles. **Conclusion** This study highlights a substantial financial burden of cancer care in Nepal and identifies the drivers of annual cost and CHE. The annual cost of cancer care was nearly three times the Nepal's GDP per capita. Almost all the patients experienced CHE at the 10% threshold while significant differences in CHE were observed across wealth quintiles at the 25% threshold. These findings warrant the urgent need for strengthening social health protection schemes and prioritizing cancer interventions within the country's health benefit packages.

Ind-2168 The Economic Burden of Tobacco-related Diseases in the Philippines

PRESENTER: **Julienne Lechuga**
AUTHORS: Mr. Patrick James Encarnacion, Miharu Kimwell, Dante Salvador Jr., Joseph Oraño, Denese De Guzman

Background: Despite declining tobacco use prevalence in the Philippines following the implementation of the Sin Tax Law, the economic impact of tobacco-related diseases (TRDs) remains substantial. This study aimed to estimate the economic burden of TRDs and evaluate the potential impact of policy interventions on health outcomes and associated costs in the Philippine setting. Methods: We employed a prevalence-based, population-attributable fraction (PAF) approach to estimate direct and indirect costs of 37 TRDs (27 causally-linked and 10 associated diseases) from a societal perspective across a lifetime horizon. The list of the TRDs were aligned in consensus with the Department of Health. Data sources included the 2015 Philippine Global Adult Tobacco Survey, 2019 Global Burden of Disease Study, Philippine Health Insurance Corporation claims, and published literature. We calculated direct medical costs (inpatient and outpatient care), direct non-medical costs (transportation and meals), indirect morbidity costs (productivity losses), and indirect mortality costs (years of life lost) in 2021 Philippine pesos. Results: We identified 3.90 million tobacco-attributable disease cases and 1.95 million years of life lost, with around 60% attributed to ischemic heart disease, tuberculosis, and COPD. Direct medical costs contributed the largest at PHP 247 billion (67.5%), with higher costs in females (PHP 136.58 billion) than males (PHP 110.41 billion). Conversely, indirect costs were higher in males (morbidity: PHP 17.58 billion; mortality: PHP 51.05 billion) compared to that of females (morbidity: PHP13.13 billion; mortality: PHP22.05 billion). The top economic burden contributors were ischemic heart disease (PHP 65.55 billion), peripheral artery disease (PHP 58.17 billion), and COPD (PHP 56.19 billion), with notable gender variations in disease rankings. The 2012 Sin Tax Law implementation was associated with a 14.49% decrease in TRD prevalence in males and 42% in females, potentially saving PHP 149 billion in healthcare costs. Limitations: The analysis faced

constraints regarding data availability and the generalizability of relative risk values. Model assumptions about patient outcomes may underestimate the true economic burden of TRDs. Conclusion: This analysis demonstrated the substantial economic impact of TRDs in the Philippines, highlighting the need for strengthened tobacco control policies and sustained Sin Tax Law implementation. Our findings suggest that additional price increases could further reduce disease burden and generate significant healthcare cost savings. The results support continued investment in tobacco control measures while emphasizing the importance of robust health information systems for monitoring policy impacts.

Ind-999 High-Cost Users under Universal Health Coverage in Thailand

PRESENTER: **Picharee Karunayawong**
AUTHORS: Thanayut Saeraneesopon, Piyada Gaewkhiew, Ms. Wanrudee Isaranuwatchai

Background: The High-Cost Users (HCUs) phenomenon in healthcare systems exists when a small proportion of patients account for a large share of healthcare expenditure. By understanding this phenomenon, tailored interventions can be designed to ensure patients receive the necessary care while reducing the burden on health systems, particularly during resource-scarce periods such as the COVID-19 pandemic. To the best of our knowledge, this is the first study that able to combine and analyze individual healthcare expenditure data across Thailand's three major public health insurance schemes. **Objectives:** This study aimed to: (1) Determine whether the HCUs phenomenon existed in Thailand across different public health insurance schemes by analyzing inpatient health expenditure patterns from 2016 to 2023; (2) Identify the characteristics of HCUs; (3) Examine the top five primary diagnoses among HCUs; and (4) Explore potential predictors associated with becoming an HCU*.* **Methods:** Secondary data analysis was conducted using Inpatient Department (IPD) e-Claim data from the National Health Security Office for the Universal Coverage Scheme (UCS), which provides healthcare to approximately 80% of the Thai population. Data from the Central Office for Healthcare Information was used for the Social Security Scheme (SSS) and the Civil Service Medical Benefits Scheme (CSMBS), which collectively serve the remaining 20% of the population. Descriptive analysis was employed to calculate health expenditures over time and examine population characteristics. Multinomial logistic regression was used to identify potential predictors of HCUs. **Results:** The findings of the earlier phase of studies confirm that under the UCS, HCUs (i.e., the top 5% of the population) utilized approximately 40% of the annual healthcare expenditure. This trend persisted even during the pandemic year of 2020, affirming the existence of the HCUs phenomenon in Thailand. The characteristics of HCU patients remained relatively the same from 2016 to 2021, in terms of proportion of male to female patients (~55% and ~45%, respectively), age across 5 years (55 to 57 years old, min-max: 0-118), average length of stay per visit (~7 days, min-max: 0-5151), average number of admissions per patient per year (~3 visits), and the average healthcare cost per patient per year (≥THB 100,000). In addition, the top 5 primary diagnoses for HCUs did not change over time. For SSS and CSMBS, we also expected the existence of HCUs phenomenon but to a lesser degree due to differences in payment mechanisms population coverage, and budget allocation across the three schemes. **Conclusion:** High-Cost Users phenomenon existed in Thailand, even during the COVID-19 pandemic time where healthcare resources were carefully utilized. By understanding trends in healthcare utilization and expenditure, along with the predictors of HCUs, policies can be developed to optimize resource allocation, ensure care for those in need, and sustain Thailand's Universal Health Coverage system. **Keywords:** High-Cost Users, Health Expenditure*,* Universal Health Coverage, Big Data*,* Thailand

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10:30 AM –12:00 PM MONDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Karangasem

Access to Care and Patient Preferences

MODERATOR: **Santosh Gautam**,

Ind-1701 Trade-off Between Travel Distance and Quality of Care: A Discrete Choice Experiment

PRESENTER: **Moo Hyuk Lee**
AUTHORS: Soela Kim, Young Kyung Do, Un-na Kim

Background:

Patients' hospital choice often involves a trade-off between quality of care and distance to hospitals. This is especially prominent in South Korea, where patients with severe diseases such as cancer *outmigrate* to the capital city Seoul – that is, they bypass regional hospitals and travel to Seoul in the hopes of receiving better treatment. South Korea provides an ideal context for exploring such trade-offs due to its extensive transportation network and relatively small nation size, allowing patients in provincial areas to easily travel to Seoul. Previous studies examining hospital choice behaviors worldwide have quantified the relative importance of distance and quality through healthcare utilization data. However, quantitative insights into their trade-offs based on general population's stated preferences remain underexplored, particularly regarding their inter-regional bypassing behavior. This study aims to fill this gap by providing a quantitative analysis for understanding how distance and quality show trade-off in hospital choice, using a discrete choice experiment on a general population.

Methods:

A discrete choice experiment was conducted with a nationwide sample of 1,679 respondents (excluding Seoul residents), stratified by age, gender, region, and income. Five key attributes influencing hospital choice and their levels were identified based on focused group discussions: physician competence (middle, high, very high), facilities/equipment (middle, good), hospital reputation (middle, high), recommendation from friends or families (no, yes), and one-way travel distance (1, 2, 3, 4, or 5 hours). Respondents were presented with a hypothetical scenario in which they were diagnosed with severe diseases such as cancer, and were asked to choose between two hospitals with varying attribute levels.

Coefficients were estimated using a conditional logit model, and willingness-to-accept (WTA) values were calculated to quantify trade-offs between distance and other attributes. Subgroup analysis was also conducted, based on whether the respondent had intention to outmigrate.

Results:

Increasing physician competence from middle to very high would allow respondents to accept 5.50 additional hours of travel. Improvement of facilities/equipment from middle to good would allow respondents to accept 1.54 additional hours, and the presence of recommendation from friends of families would allow them to accept 0.77 additional hours. Subgroup analysis revealed that respondents willing to outmigrate in case of cancer diagnosis were willing to accept greater travel time increases for increased physician competence (WTA = 6.46 hours) and increased facilities/equipment (WTA = 1.79 hours), while they would require shorter distances when recommendations were present (WTA = 0.66 hours).

Discussion:

The results show that respondents were willing to travel further for hospitals with higher physician competence or better facilities. This highlights the importance of both perceived (physician competence) and objective (facilities/equipment) quality. The exceptionally high WTA values for physician competence suggests that perceived quality plays a crucial role in hospital choice. In addition, higher WTA values for quality factors among respondents willing to outmigrate supports that outmigration is strongly driven by quality gradients between Seoul and non-Seoul regions. Policy efforts to mitigate the severe concentration of patients into Seoul should prioritize enhancing quality factors in non-Seoul regions to shift the perceptions of the population.

Ind-1541 A New Tool for Patient Experience and Preferences in Urgent Care: Psychometric Validation and Discrete Choice Experiment Study

PRESENTER: **Jyoti Khadka**, Flinders University
AUTHOR: Julie Ratcliffe

Background Older people (age ≥65 years) are significant users of emergency department (ED) services. In 2023-23, more than one quarter of all ED presentations were by older people and over half of those presenting at the ED were subsequently admitted to hospital. To reduce pressure to ED and hospitals, the Australian government introduced Medicare-funded Urgent Care Clinics in June 2023, aiming to reduce the number of older people presenting to ED with urgent but non-emergency healthcare needs. However, the patient experience and preferences of older people in the new urgent care settings remain underexplored, limiting the ability of health systems to improve services that align with their care needs. Globally, patient experience is increasingly recognised as a critical indicator of healthcare quality, yet instruments specifically tailored to urgent and emergency care for quality assessment and economic evaluation are scarce.

Research questions/aims

This study addresses two key gaps: (1) developing and validating a new instrument, the Urgent and Emergency Care Patient Experience Measure (UEC-PEM), a brief patient-reported experience measure developed for urgent care for quality assessment and economic evaluation, and (2) exploring older people' preferences for urgent care service attributes used in the UCE-PEM using a discrete choice experiment (DCE).

Methods Two complementary studies were undertaken. In the first, the UEC-PEE, a 5-item patient experience measure developed through expert and patient consultation. The UCE-PEM was completed by 205 older people (mean age 75±6.0 years, 59% females) who had received urgent or emergency care within the past year. Psychometric evaluation included Rasch analysis and assessment of construct validity using spearman's correlations with validated tools (Quality of Life-Aged Care Consumers, QOL-ACC; EQ-5D-5L; and Urgent Care System Questionnaire, UCSQ). In the second study, a DCE with 995 older people (mean age 76±6.0 years, 49% females)) identified preferences for urgent care service attributes. The DEC responses were analysed using conditional and mixed logit regressions.

Results The UEC-PEM demonstrated strong psychometric performance, with all items fitting Rasch model expectations (Infit/Outfit 0.83–1.29). It showed moderate correlations with UCSQ domains (rho=0.40–0.68, $p<0.001$), but weaker correlations with QOL-ACC (rho=0.28, $p<0.001$) and EQ-5D-5L (rho=0.15, $p=0.03$), supporting construct validity. Respondents indicated strong preferences for an urgent care service with reduced waiting times (within 2 hours of making the triple zero call), medical professionals with specialist training in the care of older people, holistic support and regular communication updates, physical environment to support older people and a comprehensive discharge summary and follow up with all of these attribute levels being highly statistically significant ($p<0.001$) in influencing preferences for the total sample and by sub groups reflecting key socio-demographic characteristics and emergency care experience.

Conclusions The UEC-PEM is a valid and reliable tool for assessing patient experience in urgent and emergency care settings. Our DEC findings highlight the importance of tailoring urgent care services to the needs of older adults, particularly by prioritizing shorter waiting times. specialised staff training and holistic supports, providing actionable insights for clinicians and policymakers aiming to improve urgent and emergency care experience for older adults.

Ind-1555 You Can Either Get or Miss the Service That Brought You : Understanding Patient Journeys in Accessing Hypertension Care in Rural Coastal Kenya

PRESENTER: **Robinson Oyando**
AUTHORS: Pablo Perel, Benjamin Tsofa, Brahima Diallo, Anthony Etyang, Syreen Hassan, Edwine Barasa, Ellen Nolte, Nancy Kagwanja

Background: The increasing burden of non-communicable diseases (NCDs) poses challenges to health systems globally, including in Kenya. Research on health system capacity for the management of NCDs has focused on system 'hardware' (e.g., availability of equipment) while less is known about health system 'software' (e.g., relationships). Yet, 'software' elements are key for the organization and delivery of person-

centred health services. This study applied a complexity lens to assess the subnational health system's capacity to deliver primary care services for hypertension in rural Kenya. **Methods:** We collected qualitative data at five health facilities (dispensaries (n=2), health centres (n=2) and a county hospital (n=1)) in two sub-counties in Kilifi County where the prevalence of hypertension is high (26%) and blood pressure control is poor (3%). We conducted in-depth interviews with front-line health workers (FLHWs), facility managers, sub-county and county health officials, Ministry of Health officials and NCD stakeholders (n=37). We transcribed the interviews verbatim and managed data using QSR NVivo 12. We applied a thematic approach to data analysis. We utilized organizational capacity theory as our analytical framework. **Results:** We use organizational capacity dimensions to present findings. **Health system hardware capacity**: there were gaps in financing, number and skill mix of FLHWs, infrastructure and commodities, which undermined comprehensiveness of care. Access was supported through decentralizing hypertension care to lower-level facilities, but cost barriers reduced access. **Health system tangible software capacity:** organizational arrangements such as FLHWs responsible for hypertension clinics and dedicated hypertension clinic days were present, though others such as availability of treatment guidelines and FLHW training were absent. Bureaucratic approval processes hindered FLHWs ideas of implementing support for patients who had difficulties adhering to medication regimen. Coordination and continuity of care were affected by poor referral systems and lack of mechanisms for patient follow-up. **Health system intangible software capacity:** participants reported that power resided with political leaders and controllers of finance who influenced the resourcing and consequently the management of hypertension. As a result, facility managers felt unable to address the resource gaps that would have improved service delivery. **Conclusion:** Health system software such as organizational norms is core to shaping health system capacity for primary care management of hypertension. There is a need to systematically invest in capacity to enable access to care and person-centred health systems. Enhancing referral systems through strengthening community linkages and establishing mechanisms to channel ideas for improving patient management are examples of urgent interventions.

Ind-2325 Effect of Antenatal Care on Birth Outcomes in the Gambia: A Propensity Score Matching Analysis

PRESENTER: **Santosh Kumar**, Notre Dame University
AUTHORS: Elizabeth Wood, Alasana Suso

Background The prevalence of low birth weight (LBW) is disproportionately high in developing countries, particularly in African countries. LBW infants have a greater risk of mortality and suffer from physical and cognitive impairment. Adequate antenatal care (ANC) can improve birth outcomes and mitigate the risk of LBW; however, there is limited evidence on the effectiveness of ANC on birth outcomes in resource-poor settings. The objective of this study was to estimate the causal association between ANC and birth outcomes in the Gambia. **Methods** The 2019-20 Gambian Demographic and Health Survey (GHDS) was used for the analysis. The GHDS collected birth weight information for 8,362 children born in the five years preceding the survey. After excluding observations with missing birth weight information, the final analytical sample included 4,443 children. A multivariate regression model and propensity score matching method were used to assess the associations between ANC and birth outcomes. The regression models were adjusted for sex and birth order of the child, maternal age and education, wealth quintiles, marital status, rural area, number of children under five years of age, and region fixed effects. **Results** Multivariate regression analysis revealed that one additional ANC visit increased birthweight by 22 grams and the probability of LBW by 1.2 percentage points. Mothers who had four or more ANC visits (ANC 4+) had a 3.9 percentage point lower likelihood of giving birth to LBW infants than mothers with fewer than four ANC visits. The matching analysis revealed that the average treatment effect of ANC 4+ was a 71-gram increase in birth weight and a 4.7 percentage point reduction in LBW. **Conclusions** Having more ANC visits is associated with improved birth outcomes in Gambia after controlling for the socioeconomic status of the households. Thus, it is important to design health policies that can ensure that women have adequate ANC visits during pregnancy to reduce the disproportionate burden of LBW in countries with limited resources. 1

10:30 AM –12:00 PM MONDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Jasmine

Using Stated Preferences for Public Health

MODERATOR: **Elzbieta W. Buczak-Stec**,

Ind-1794 The Smart one Asks When They Don't Know: Exploring the Barriers & Facilitators to Attending Cancer Testing for Patients With Anxiety and/or Depression

PRESENTER: **Anne Spencer**, University of Exeter
AUTHORS: Sarah Price, Elizabeth Shephard, Laura Gill

Background

Previous research has found that anxiety and/or depression is associated with a higher 30-day mortality after cancer diagnosis and lower odds of diagnosis via an urgent referral route. Anxiety and/or depression may present barriers to attending cancer testing appointments, leading to poorer outcomes.

Aim

Complex health interventions require an understanding of user preferences to maximize uptake and effectiveness. This qualitative study explores the attitudes and priorities that people with anxiety or depression consider when deciding to attend urgent referrals for cancer tests. The

qualitative results capture the determinants of behaviour to support intervention design and prepares the way for a future discrete choice experiment (DCE) to quantify the strength of user preferences and uptake of new interventions.

Methods

People (n=24) with anxiety and/or depression were recruited from five rural, urban or coastal general practices in the Southwest Clinical Research Network in the UK. Semi-structured interviews used hypothetical scenarios to explore decision-making around appointment attendance. Interviews were transcribed and coded deductively and inductively in NVivo drawing on the 14 domains of the Theoretical Domains Framework (TDF) capturing determinants of behaviour to support intervention design. Results were synthesised narratively.

Results

Six important TDF domains emerged as barriers or facilitators to appointment attendance, acting within a meta-theme of how an individual's experiences and situation influence their decision-making. Personal *Identity* could reinforce decisions to attend appointment or be a barrier. *Knowledge* (of cancer itself, of cancer testing or the logistics of attending) could reassure or exacerbate anxiety about attendance. *Social influences*, particularly support while waiting for the appointment, were important to people. Some stated they would need someone to support them through the process, whereas others felt they would be better on their own. *Beliefs about consequences and current emotions* were linked with fatalistic tendencies and increased chances of non-attendance*.* Additionally, the *Environmental context* highlighted barriers such as taking time off work, getting to the appointment (including parking) and the waiting room environment. How the referral was communicated was important (*Resources*), including the mode (letter or phone call) and the amount of detail provided.

Inductive themes of *Avoidance* arose, along with *continuity of care* and *Responsibilitisation* (namely, shifting responsibility from healthcare to the individual with many saying they would have good intentions to attend).

Implications for practice/policy

Anxiety and/or depression influence decision-making around urgent referral attendance in variable and nuanced ways. Barriers and facilitators to attendance ranged from lack of social support to attend the appointment, emotions and avoidance, as well as previous experiences of hospital appointments or cancer referrals. The study lays the groundwork for informing a future DCE to develop interventions that could help to facilitate the uptake of referrals, including adjusting the wording of the initial referral letter through to offering support to attend the referral.

Ind-1491 Hybrid Choice Models: The State of the Practice and Applications in Health

PRESENTER: **Eline M. van den Broek-Altenburg**, University of Vermont
AUTHOR: John Rose

Discrete Choice Models (DCMs) have over the past few decades, become the dominant modelling approach for understanding preferences and behavior within different healthcare settings. The estimation of DCMs requires that the analyst specifies unique utility functions for each of the alternatives faced by various decision makers operating within the market being modelled. The most common utility specifications employed within the health economics arena depict the relationship between utility and a set of observable variables, typically consisting of attributes that describe the alternatives being modelled, characteristics of the decision makers making the observed decisions, or some combination of both. Noting over four decades ago that modelling rational utility-maximizing behavior need not be limited to the inclusion of directly observable variables as is commonly the case, McFadden (1986) developed the theoretical framework for what has become known as the hybrid choice model (HCM) specifically to allow for the inclusion of other plausible aspects of decision making that may help explain observed choice behavior, such as attitudes and perceptions.

The HCM is not yet been widely adopted in health preferences which is striking since attitudes and perceptions are considered plausible aspects of decision making in health that may help explain observed choice behavior. This may be since HCM are not very well understood. In this paper, we therefore set out to describe what the HCM is, what it is not, and the state of practice related to estimation of the model. The paper describes alternative specifications of the HCM and their different interpretations, as well as describing the limitations of the model itself. In doing so, the paper also seeks to delineate between attitudes and perceptions and how both can be measured using stated preferences data for individual diagnostic testing.

We use data from a discrete choice experiment identifying barriers to COVID-19 testing with the goal to develop optimal strategies to increase testing in future pandemics or public health crises. A particular challenge during the Covid-19 pandemic was to provide testing and treatment for already disadvantaged and vulnerable populations. It is unclear that if potential barriers to testing were due to systemic challenges or whether there were underlying individuals motivations for not getting tested. In the DCE, we collected demographic data, data on housing and employment, vaccination acceptance, testing attitudes, risk taking behaviors using the GRiPS score, conspirational thinking and anti-expert sentiment, trust in public health authorities, political preference and religion.

The preliminary results of the HCM suggest that important social, behavioral and even policy factors affect choice for testing. Contrary to our hypotheses, rurality did not significantly impact preferences for testing, but attitudes towards government and other beliefs did. Health care interventions intended to reduce rural health disparities that do not reflect the underlying values of individuals in those subpopulations are unlikely to be successful. This paper outlines the importance of the use of HCM in health economics to include individuals' attitudes, beliefs and perceptions in the analysis of preference heterogeneity.

Ind-637 Patient Preferences for Second-Line Anti-hyperglycaemic Medication in China: A Multi-center Best-Worst Scaling Case 2 study

PRESENTER: **Dai Lian**
AUTHORS: Jing Liu, Yan Wei, Yi Yang, Yanfeng Ren, Shiyi Bao, Liu Liu, Shimeng Liu, Yingyao Chen

Background: China faces the world's largest diabetes burden, with a 12.4% prevalence. A wide range of second-line therapies is available for patients with type 2 diabetes mellitus (T2DM), each with distinct characteristics. Although current guidelines advocate for a patient-centered approach in selecting second-line treatments, Best Worst Scaling profile case (BWS-2) evidence on patient preferences for these therapies in the Chinese population remains limited.

Method: A seven-attribute instrument was designed through literature review, expert input, and a pilot BWS object-case study, captured benefit-risk and cost dimensions. We applied an orthogonal main-effects design to generate choice sets. The survey was conducted through in-person interviews at healthcare institutions in three Chinese regions (eastern, central, and western), each with one selected provincial capital and one non-provincial city. Data were analyzed using counting approach, conditional and mixed logit regression. Preference heterogeneity was explored with latent class analysis (LCA).

Results: Among 1,517 respondents analyzed, most attribute coefficients were statistically significant in mixlogit analysis, with patients showed the highest preference for reduction in HbA1c, cardiovascular protection, and free out-of-pocket costs compared to the reference levels. Weight change and mode of administration exerted modest influence. LCA identified the following six unobserved subgroups: Cardiovascular Benefit-Focused, Injection-Averse, Adverse Drug Reaction-Insensitive, Glycemic Control-Driven, Extreme Cost-sensitive Preference, Neutral Attitude.

Conclusions: Chinese T2DM patients prioritize efficacy and costs attributes; however, LCA revealed significant heterogeneity. Understanding these preference variations supports personalized second-line treatment decisions to enhance patient adherence and satisfaction.

Ind-1285 Willingness to Accept Trade-offs in a Pandemic in Developing Countries: How Past Pandemic Experiences Shape Preferences For Future Pandemics.

PRESENTER: **Vinh Anh Huynh**
AUTHORS: Eric Finkelstein, Semra Ozdemir

Introduction

Past pandemics, including COVID-19, have forced governments and the general public to make difficult trade-offs between health and economic activities. Social and economic restrictions helped mitigate health risks but caused significant increase in mental health risk and income loss. Current literature studying the health and wealth trade-off in pandemic contexts have focused mostly on lifting of restrictions or vaccination strategies and few are set in low- and middle-income countries (LMICs) which have greater resource constraints, different societal values and priorities. This study aims to quantify the public's willingness to accept (WTA) trade-offs between pandemic-related societal health outcomes, personal health risks, and household income losses that may result from a future pandemic, focusing on Indonesia and Vietnam, two LMICs with vastly different COVID-19 responses and outcomes. We hypothesized that there is significant heterogeneity in WTA trade-offs across individuals and that individuals' COVID-19 traumas, such as suffering financial hardship, or having friends or family members died, influence their WTA trade-offs.

Methods:

We fielded a discrete choice experiment asking respondents to choose between hypothetical future pandemic scenarios, described in terms of societal number of deaths, suffering long-term complications, developing anxiety/depression, mirroring personal risks of those outcomes and lastly household income (HHI) loss. Latent-class analyses (LCA) with a non-attendance class were used to estimate relative preferences and attribute importance. Multinomial logit regressions were used to assess associations between COVID-19 experiences and class membership.

Results:

A total of 534 Vietnamese and 526 Indonesians were recruited from online panels and were broadly similar to their respective general population in terms of sociodemographics. LCA revealed a non-attendance class (20%) and 2 distinct preference patterns among the Vietnamese sample. The largest class (Class 1, 42%) represented societal death minimizers, who were willing to accept up to 7.9% (95% confidence interval (CI): -5.0% to 20.8%) reduction in HHI to avoid 10,000 societal deaths. Class 2 (38%), however, represents income protectionists who were only willing to accept 0.6% (0.2% to 1.0%) reduction in HHI for the same reduction in societal deaths. While Indonesians also had a non-attendance class (32%) and 2 similar classes as Vietnam, there was a small third class (14%) with more balanced preferences. Societal death minimizers (Class 1) remained the largest (31%) and were willing to accept up to 2.1% (1.2% to 3.0%) reduction in HHI to avoid 10,000 societal deaths as compared to 0.1% (0.0% to 0.2%) among income protectionists (Class 2, 23%). As hypothesized, those with friends or family members died because of COVID-19 were more likely to be societal death minimisers, although this was only observed among Vietnamese but not Indonesians. Contrary to hypothesis, those who experienced financial hardship because of COVID-19 were not more likely to be income loss minimizers.

Conclusion:

While Indonesians and Vietnamese had diverse WTA trade-offs, there were similar preferences patterns across both countries. Governments should consider less restrictive or tailored policies to different groups with varying risk tolerance and past experiences, such as in areas where there were high COVID-19 mortalities, to ensure policies are social welfare maximising.

Ind-2075 Stated Preferences and Numerical Ability: Implications for Public Policy Analysis

PRESENTER: **Michael Eber**

Research Question:

Stated preference surveys are an important way to assess the economic value people place on health improvements. These surveys ask respondents how much they would be willing to pay for hypothetical outcomes that often cannot be fully valued in economic markets. Surveys frequently ask respondents to value complicated numerical quantities such as small health risk reductions, which may be difficult for them to process. The objective of this study was to assess whether people's responses to these surveys are influenced by their ability to work with numerical information. Understanding whether numerical ability leads to bias in value estimates informs the use of these estimates in cost-benefit analysis and other policy analyses.

Methods:

In a preregistered survey experiment with 1,200 participants, we asked respondents to report their willingness to pay (WTP) for a hypothetical food safety program that reduced their risk of mortality by a randomized amount. WTP was measured using a single binary choice question, as well as a multiple price list. To assess numerical ability, we measured participants' objective numeracy using the validated Weller et al. (2013) abbreviated numeracy scale.

In a first analysis, we tested the hypothesis that high numerate respondents would provide valuations more sensitive than low numerate respondents to the magnitude of the randomized health risks provided. We categorized respondents with a numeracy test score of greater than four out of eight as high numerate and categorized other respondents as low numerate. In a second analysis designed to examine the causal relationship between numerical ability and sensitivity, we conducted a randomized intervention that presented some participants with compound risks instead of simple risks.

Results:

A total of 1,195 respondents correctly answered three comprehension questions and an attention check question, and these participants were included in the study. Among survey respondents randomized to receive simple risks (N=898), average willingness to pay increased significantly and nearly linearly with the risk reduction for respondents who had high levels of objective numeracy, while for those respondents with lower levels of objective numeracy, average valuations did not consistently increase with the risk reduction. Using a continuous measure of numeracy in regression analysis, higher numeracy was associated with increased sensitivity ($p<0.05$) and lower valuations ($p<0.01$).

The high numerate who received compound risks had lower sensitivity to risk reduction magnitudes compared with the high numerate randomized to receive simple risks ($p<0.05$). For the low numerate population, who did not show significant sensitivity to simple risk reduction magnitudes, there was no significant effect of the provision of compound risks.

Conclusion:

The current study provides evidence that stated preference surveys may misrepresent the preferences of people with low numerical ability. Survey designers and policymakers should interpret valuations that are insensitive to benefit magnitudes with caution and potentially as indicative of survey takers being unable to process the information provided. The current study also suggests a way that future research can test whether informational interventions like decision aids can eliminate disparities in comprehension according to respondents' numerical ability.

10:30 AM –12:00 PM MONDAY [Evaluation Of Policy, Programs And Health System Performance]

os117 Bali International Convention Centre – Jakarta A

Decolonising Health Economics Research

MODERATOR: **Maninder Pal Singh**, London School of Hygine & Tropical Medicine

DISCUSSANT: **Peter Binyaruka**, Ifakara Health Institute (IHI); **Ama Pokuaa Fenny**, Institute of Statistical, Social and Economic Research

abs-os575 Empowering LMIC Researchers: NIHR's Approach to Decolonising Funding and Collaboration

PRESENTER: **Kara Hanson**, London School of Hygiene & Tropical Medicine (LSHTM)

Equitable research partnerships and capacity strengthening are vital for decolonising global health research. This presentation delves into the strategic approaches undertaken by the National Institute for Health Research (NIHR) United Kingdom, to address historical inequities in research collaborations with low- and middle-income countries (LMICs). The NIHR is actively restructuring its funding mechanisms to empower LMIC researchers, removing the previous requirement for UK-based co-leads and prioritising research driven by local contexts and needs. By enabling LMIC institutions to lead projects, these changes foster sustainable, context-specific research that directly benefits local populations. A notable initiative in this effort is the introduction of the Global Research Advanced Fellowship, designed to nurture leadership and research management skills among LMIC researchers. By investing in capacity strengthening, NIHR aims to shift traditional power dynamics, ensuring that LMIC researchers play a central role in setting research agendas. Additionally, NIHR emphasizes collaborative frameworks that incorporate mutual learning, respect for local expertise, and equitable authorship practices, thereby challenging entrenched

colonial models of research partnership. This presentation will highlight practical examples of how these strategies are being implemented, showcasing NIHR's commitment to fostering more inclusive and sustainable research ecosystems. By prioritising locally-led projects and equitable collaboration models, NIHR seeks to advance a more decolonised and inclusive approach to health economics research, ultimately contributing to global health equity.

abs-os569 Power Dynamics in Health Economics Research & Impact of Colonial Legacies

PRESENTER: **Shankar Prinja**

This presentation will critically examine the enduring influence of these colonial structures on health economics research in low- and middle-income countries (LMICs) to highlight challenges in terms of dictating research priorities, funding decisions, methodologies, and dissemination strategies. These power imbalances often relegate LMIC researchers to a subordinate role and restricting their participation in intellectual leadership. For instance, exclusion from lead authorship, despite making substantial contributions to data collection and contextual analysis. Such practices perpetuate systemic inequities in the production and ownership of knowledge.

Continued dependency on external funding is a key challenge, which drives research priorities based on funder's decisions and not to generate datasets and solutions which are more relevant to local problems in research and evidence-based policy making. To counter this, there is a pressing need to harness to strengthen research capacity and foster self-determined agendas. Innovative approaches, such as mobilizing long term national funding sources can be a way forward. Establishment of Health technology Assessment Board in India (HTAIn) and Regional Resource Centres in an excellent example of capacity development which supported budding health economists and led to multiple international research collaborations. Such policy decisions not only empower local researchers but also enhance the applicability of research outcomes to inform national policy.

The presentation will also address the barriers which researchers face for publication of their work. Not just the publication charges but also varied research interests and inability to contextualize local needs (editor/reviewer and researcher) can hinder the timely publication of results in international peer reviewed journals. Ultimately, this presentation will argue for decolonising health economics research by undertaking a fundamental restructuring of how partnerships are formed, funded, and operationalized, to ensure that LMIC researchers can meaningfully contribute to and lead the health economics research.

abs-os571 Rebalancing Power: Using the Equipar Tool to Build Equitable Partnerships in Health Economics Research

PRESENTER: **Catherine Goodman**, London School of Hygiene & Tropical Medicine (LSHTM)

Addressing power imbalances in research partnerships is critical to decolonising health economics research. The EquiPar Tool, developed to support equitable collaborations, offers a structured approach to fostering fairness and mutual benefit in research projects, especially between high income and low- and middle-income country (LMIC) institutions. EquiPar is a flexible, question-driven tool designed to prompt research teams to critically reflect on key aspects of their collaborations across three domains: people management, research activities, and contracting and resource management. It guides users through assessing topics such as their governance structures, communication strategies, shared responsibilities, and the equitable distribution of resources, considering equity both between research organisations and within the professional heirarchy. By incorporating principles such as mutual capacity strengthening, transparency, and co-creation, EquiPar ensures that partnerships are built on trust and shared decision-making. This presentation will provide practical examples of how EquiPar has been applied within research partnerships, reporting on results from a recent pilot evaluation. Ultimately, this presentation will reflect on how EquiPar and other similar tools can be used as a catalyst for more equitable, context-sensitive, and impactful research partnerships, driving the decolonisation of health economics research.

10:30 AM –12:00 PM MONDAY [Demand & Utilization Of Health Services]

os135 Bali International Convention Centre – Hibiscus

Unpacking the Effects of Floods and Heatwaves on Maternal Health Care Coverage and Vulnerability Drivers.

MODERATOR: **Josephine Borghi**, IIASA

DISCUSSANT: **Manuela De Allegri**, University of Heidelberg

abs-os196 Assessing the Impacts and Mechanisms of Heat Waves and Floods on Maternal Healthcare Utilisation: A Realist-Informed Systematic Review.

PRESENTER: **Ivan Augusto Cecilio e Silva**

AUTHORS: Everton Nunes da Silva, Dell Saulnier, Huiqi Chen, Giacomo Balbinotto, Cherie Part, Nikita Strelkovskii, Chitalu Chama Chiliba, Ms. Josephine Borghi, Sari Kovats

Background: The increasing frequency and intensity of heatwaves and floods worldwide pose significant challenges to healthcare systems, with potential to affect service coverage, especially among vulnerable groups like pregnant and postpartum women. Developing strategies for health sector adaptation to reduce climate risks requires an understanding of whether and how extreme weather events affect the utilisation of maternal healthcare (MH). We undertook a realist-informed systematic review to examine in which geographic, socioeconomic and health

system contexts MH utilization is affected and the underlying mechanisms driving these impacts.

Methods: A comprehensive literature search across multiple databases (Medline, Embase, EconLit, Global Health, Web of Science, CINAHL, Global Index Medicus) identified 5280 studies which were dual screened against set inclusion/exclusion criteria, resolving discrepancies by consensus. For inclusion, studies considered heatwave and/or flood impacts on service utilization by pregnant, postpartum women (up to 6 weeks post-delivery) and women of reproductive age (for family planning), without restrictions on study design, period, setting, or language. Based on the evidence gathered, an initial theoretical framework was developed and refined through the creation of a Causal Loop Diagram (CLD), to map out the causal mechanisms underpinning flood and heatwave effects on MH utilisation.

Results: Thirty-six papers, 23 on floods, 12 on heatwaves and one on both, were included.** Preliminary findings suggest floods can reduce utilization of antenatal, delivery and postnatal care. Although evidence on heatwaves is more limited, studies suggest that high temperatures can discourage individuals from seeking necessary care, particularly antenatal visits, where travel involves long or exposed routes. Utilisation impacts were also due to disruptions to healthcare supply: damage to infrastructure and shortages of supplies and personnel. Additionally, the economic strain from floods can deplete family resources, making healthcare less affordable for affected communities, reducing service use. Heatwaves exacerbate existing health conditions, leading to a surge in demand for emergency healthcare services, as individuals experience acute health risks that require immediate attention. This increased demand can indirectly impact the utilization of MH services by diverting resources and limiting access to routine care. Heatwaves also raise operational costs for health facilities, such as those associated with air conditioning. Floods often lead to displacement which can worsen health outcomes by reducing income, land ownership, food security, and access to clean water and sanitation, increasing healthcare demand while also limiting service affordability due to socioeconomic challenges and weakened social networks. To summarize, we found evidence of five mechanisms through which heatwaves and floods impact MH utilisation: (1) travel restrictions, (2) displacement and migration, (3) income loss affecting affordability, (4) health risks, and (5) disruptions in healthcare supply. These mechanisms interact with each other and can have differential effects according to context.

Conclusion: This review finds evidence of some common and some hazard specific demand and supply side effects of floods and heatwaves on MH utilization, together with contextual factors driving vulnerability. The results can inform policymakers, healthcare providers, and researchers, guiding the development of targeted strategies to safeguard MH against climate change.

abs-os199 The Effect of Extreme Heat on Place and Type of Delivery in Brazil.

PRESENTER: **Everton Nunes da Silva**, University of Brasilia
AUTHORS: Letícia Xander, Deivson Costa, Ivan Augusto Cecilio e Silva, Huiqi Chen, Andre Marques dos Santos, Cherie Part, Walter Ramalho

Background: Climate change results in increasing temperatures and extreme heat events with implications for population health and well-being. Heat extremes pose a particular risk to pregnant women, increasing the chance of preterm birth, stillbirth, gestational hypertension and diabetes. These consequences may in turn affect where women deliver and the need for c-section. Equally, heat impacts on health worker productivity and facility patient load may affect caesarean section (c-section) rates. However, there is limited evidence of the impact of heat on maternal health care-seeking behaviour and on health service provision. We investigate the effect of extreme heat on place and type of delivery in Brazil. The study also explored whether individual and local area factors moderated this relationship.

Methods: We obtained data on more than 25 million singleton births, in 5,570 municipalities between 2010 and 2019, from Brazil's Live Birth Information System (SINASC/DATASUS). Our primary outcomes were type of delivery (c-section or not) and place of delivery (hospital or not). Daily maximum air temperature was calculated from ERA5 reanalysis data (obtained from Copernicus Climate Data Store) and aggregated to municipality-level. We also assessed the impact of heatwaves to capture the cumulative effect of heat exposure over a sequence of unusually hot days. Heatwaves were defined as five or more consecutive days above the location-specific 95th, 97th, and 99th percentiles of daily maximum temperature during the last 30 years. Exposure data were linked to individual-level birth data by date of delivery and municipality of mother's residence. The analytical approach involved a logistic regression including cohort and municipality fixed effects to account for unobserved heterogeneity. All models adjusted for maternal characteristics (age, education, marital status, and ethnicity), birth outcomes (length of gestation and birth weight), and number of antenatal care visits during pregnancy. We also considered whether hospital ownership (public versus private); municipality location (urban versus rural); climate zone (cooler versus hotter) and health system characteristics (ratio of family health teams and hospitals to population) moderated the relationship. In addition, we considered potential delayed effects of heat, 1-6 days before the outcome, following a distributed lag nonlinear framework.

Results: Preliminary results indicate that higher temperatures increase the rate of delivery by c-section. Effects are larger in public hospitals, where the rate of c-section is typically lower. Temperature lags are robustly associated with type of delivery, with a slightly greater effect of high temperature 5 and 6 days before delivery compared with exposure 0-4 days before delivery. Deliveries by c-section also increase during heatwaves. We find no association between maximum temperature and place of delivery. Hospital delivery increases only during the 95th percentile heatwave. Local factors, such as hospital distance and rural location, moderate the relationship between place of delivery and heat.

Conclusion: Our study highlights the geographical distribution of heatwaves across Brazil, and assesses the impact of heatwaves on place and type of delivery. By examining how context moderates this relationship, our study also sheds light on the role of geography, health and other social systems in enhancing or reducing vulnerability to heat.

abs-os197 The Effect of Floods and Heat Extremes on Coverage of Routine Maternal Health Services in Zambia.

PRESENTER: **Chitalu Chama Chiliba**
AUTHORS: Dell Saulnier, Ms. Josephine Borghi, Cherie Part, Moses Chisola

Background: The global climate is changing rapidly, with rising temperatures, erratic rainfall, and an increasing frequency of extreme weather

events such as floods and heatwaves. These climatic shifts pose significant risks to maternal health, particularly in resource-limited settings striving to achieve universal health coverage. Extreme weather events disrupt livelihoods, reduce access to affordable care, and displace populations to areas with limited health services. Damage to transport networks and medical supply chains further increase costs and limit the availability of care. Public health facility operations may also suffer, pushing patients towards costlier alternatives. Despite these challenges, the effects of extreme weather on the use of maternal health services remains underexplored, particularly in low-income countries.

Aim: The study estimates the causal effect of flooding and heatwaves on the utilization of maternal health services, including institutional deliveries, caesarean births, antenatal care, and postnatal care.

Methods: We use data from two nationally representative Demographic and Health Surveys conducted in Zambia, linked with high-resolution climate data, to implement a difference-in-difference analysis exploiting the geographic and temporal variation in exposure to extreme weather events, whilst controlling for household and area level characteristics. Household data are linked to climate exposure based on survey cluster geo-coordinates. Flood exposure is determined using NASA's MODIS Global Flood Product and the Global Surface Water database. A household is classified as flood-exposed if water is detected within a 2km² radius of the household, or within a 2km (urban) or 5km (rural) catchment area of its nearest health facility. Flood intensity is measured by the extent of water coverage. Heatwave exposure is identified using ERA5-Land re-analysis data and is defined as three or more consecutive days above the 90th, 95th, and 99th percentiles of daily maximum temperatures during the three hottest months (reference period 1990-2019). Annual heatwave frequency is also recorded. We also explore heterogeneous effects, by socio-economic status and distance to facility, of the exposure to flooding and heatwaves.

Key Results: We present the effects of flooding and heatwave exposure on maternal health service use in Zambia by service type. We also show differential effects across subgroups, identifying those most at risk, and explore mediators of effect.

Conclusions: The study provides evidence of how climate change, through more frequent weather events, affects maternal service utilisation, and drivers of vulnerability. The findings highlight the need for adaptive health system strategies to mitigate the impacts of extreme weather events. Interventions that promote health equity and system resilience, are essential to ensuring that maternal health services remain accessible and affordable to all despite escalating climate risks.

10:30 AM –12:00 PM MONDAY [Health Beyond The Health System]

os147 Bali International Convention Centre – Singaraja

HIV Prevention Through Behavioural Change

MODERATOR: **Kenneth Roger Katumba**, MRC/UVRI & LSHTM Uganda Research Unit

CONVENER: **Kenneth Roger KATUMBA**, MRC/UVRI & LSHTM Uganda Research Unit

abs-os557 Exploring the Links Between Sexual Risk Behaviour and Cognitive Biases Among Female Sex Workers in Kampala and Nairobi

PRESENTER: **Kenneth Roger KATUMBA**

AUTHORS: Yunia Mayanja, Ms. Giulia Greco, PhD, Edel Koki, Yvonne Machira, Gabriela Gomez, Janet Seeley, Matthew Quaife, Gloria Omosa, Mitzy Gafos

Background: There is need for cognitive biases, which are mental shortcuts that simplify information processing and decision-making, to be considered more in interventions targeting structural and individual drivers of HIV transmission. We investigated links between cognitive biases and SRB among women engaged in sex work. **Methods:** We used respondent-driven sampling from September to December 2022 to identify HIV-negative women engaged in sex work, aged 18-44 years in Kampala and Nairobi. Trained enumerators collected survey data using a mobile data collection platform. We examined relationships between cognitive biases including locus of control and risk aversion, individual factors (including age, education, having children, depending on sex work as the only income source) interpersonal factors (including arrest in the last 3 months, level of violence experienced, and the influence of peers), and structural factors (including providing services outdoors, and the level of stigma experienced) and SRB variables (including the number of clients and condom use at last sexual act, PrEP use, pricing, and the price premium for condomless sex). We used logistic and ordinary least squares regression models for binary and continuous outcomes respectively. **Results:** We included 330 women with a mean age of 30.2 years (SD=6.75). A significant positive association was found between locus of control and the price premium for unprotected sex (β =12.6, $p<0.01$), but no association with other SRB variables. Risk aversion was not associated with SRB. The price premium was also associated with level of education (β=4, $p<0.05$), and negatively associated with the level of violence experienced (β= - 2.4, $p<0.05$). The number of clients women provided services to on their last day of work was negatively associated with women's level of education (β= -0.35, $p<0.01$), and positively associated with earning solely from sex work (β=0.2, $p<0.05$), and having experienced a moderate level of violence (β=0.3, $p<0.01$). Provision of condomless sex at the last act was positively associated with the level of education (OR=5.5, $p<0.01$) and providing services outdoors (OR=3.3, $p<0.05$). Women not always using condoms was positively associated with age (OR=0.3, $p<0.01$) and level of education (OR=3.4, $p<0.05$). PrEP use over the preceding 12 months was negatively associated with women's level of education (OR=0.3, $p<0.05$). Pricing was negatively associated with women's age (β= -0.7, $p<0.05$) and having been arrested for sex work (β= -0.3, $p<0.01$) and positively associated with the level of education (β =2, $p<0.01$). **Conclusion:** Besides individual, interpersonal and structural factors, SRB is associated with cognitive biases. Complex interventions aimed at interpersonal and structural levels but also increasing women's locus of control are necessary to reduce new acquisitions.

abs-os596 Individual Preferences, Sexual Risk Behaviors and Demand for Preventive Care Services Among Sex Workers

PRESENTER: **Paul Dourgnon**, IRDES
AUTHORS: Antoine Marsaudon, Florence Jusot, Jerome wittwer

This study examines how risk aversion and time preferences may shape both sexual risk behaviors and the demand for preventive care, among sex workers, from an online survey representative of sex workers working from escort websites in France. While the literature has explored how individual preferences influence the demand for preventive care, we lack evidence on the interaction between risk-taking and the demand for preventive care. The study also sheds light on how these interactions may be influenced by the socioeconomic status (income, education, household structure) and migration background (country of origin, legal status, length of stay in the host country), gender, and sexual orientation of the respondents. Most sex workers in France are immigrants, among which a majority are undocumented, leading to potential fragility toward clients' requests, and more exposure to risks, whether deportation or violence. Besides some of the respondents may have suffered from violence in their country of origin due to their sexual orientation. Our study is based on an online representative survey of sex workers working in France from escort websites. The sampling base is generated from the scrapping of the main escort websites operating in France. The questionnaire includes health status, living conditions, immigration history, working conditions and description, sexual risk behaviors, illegal drug consumption, experiences of violence, and healthcare services use and insurance. Questionnaires are collected in 6 languages. Our study intends not only to better understand the interactions of risk-taking and demand for care but also to shed light on an utterly fragile yet barely known population. No consensus exists in France on the number of sex workers, their actual needs, and access to healthcare services.

abs-os578 The Role of Health Expenses on Condomless Sex Among Female Sex Workers in Urban Senegal

PRESENTER: **Henry Cust**
AUTHORS: Timothy Powell-Jackson, Aurelia Lepine

Out-of-pocket payments for healthcare present significant economic challenges for many households in low- and middle-income countries. In Senegal and Cameroon, a limited number of individuals have access to health insurance, leaving most to face high out-of-pocket costs for medical care. New evidence suggests economic shocks are driving risky behaviours in female sex workers, a high-risk HIV group, because of risk premiums associated with condomless sex. This relationship plays a crucial role in the ongoing HIV crisis and gender disparity in new infections in sub-Saharan Africa. Whilst the risk premium and behavioural impact of health expense shocks in female sex workers are well established, there exists only limited and mixed evidence that it exists amongst women in transactional sex. In this study, we are the first to examine the range of economic shocks suffered by women in commercial and transactional sex and examine the behavioural response to health shocks. We find that our sample frequently experiences economic shocks, with health shocks being the most common and impactful. To cope, many increase their involvement in sex work, and some engage in riskier sexual behaviours. We also find there is between a 62% and 72% drop in condom use at the last sex act if someone else in the household is sick at the same time for female sex workers. We highlight the implications for HIV transmission in stigmatized contexts and offer methods for protecting against economic shocks as an HIV prevention method, primarily by drawing attention to the often-overlooked population of women engaged in transactional sex.

abs-os586 Time Preference and Risky Sexual Behaviour Among Women Engaging in Commercial or Transactional Sex in Cameroon

PRESENTER: **Aurelia Lepine**, University College London
AUTHORS: Henry Cust, Tamoufe Ubald, Serge Billong, Emilemichel Nitcheu, Julienne Noo, Lauren Dechaumont, Iliassou Mfochive-njindam, Eric Defo Tamgno, Sandie Szawlowski

Background:
Despite overall progress in reducing HIV prevalence in Cameroon, women engaging in sex work and transactional sex remain disproportionately affected. These groups experience significantly higher HIV incidence, yet the behavioral mechanisms driving their sexual risk-taking are not well understood. This study explores the role of time preferences—specifically impatience (discount factor, δ) and present bias (β)—in shaping risky sexual behaviors among this high-risk population.

Methods and Data:
We analyze data from a randomized controlled trial conducted in Yaoundé, Cameroon, involving 1,146 women: 578 sex workers and 568 women in transactional sexual relationships. Time preferences were elicited through two hypothetical Money Earlier or Later experiments at midline and endline, allowing estimation of both δ (discount factor) and $\beta<1$ (present bias) and assessment of their temporal stability. Risky sexual behavior was measured using both self-reported STI symptoms and biomarker-confirmed STI and HIV outcomes.

Findings:
Participants displayed low discount factors, suggesting impatience and potential self-selection into risky sex. Most exhibited time-consistent preferences, though around 24% (δ) and 41% (present bias) showed no variation over time, indicating moderate instability. Associations between time preferences and STI/HIV outcomes were directionally consistent with theory and statistically significant for some STI proxies—particularly abdominal pain and genital ulcers—but overall results were mixed. Time preferences were influenced by socioeconomic factors, risk preferences, and education level.

Discussion:
While the study offers some support for the predictive role of time preferences in risky sexual behavior, several limitations—such as hypothetical task design, comprehension challenges, and limitations of STI diagnostic tools—temper the conclusions. Nonetheless, these findings underscore the relevance of behavioral traits in understanding sexual health risks and suggest that targeted interventions may benefit

from incorporating time preference profiles into risk stratification and program design.

10:30 AM –12:00 PM MONDAY [Supply And Regulation Of Health Services And Products]

os158 Bali International Convention Centre – Orchid

Balancing Sustainability, Access, and Affordability for Pharmaceutical Innovation: Results from the HI-PRIX project

MODERATOR: **Oriana Ciani**, SDA Bocconi

abs-os268 Does HTA Undermine the Goals of EMA Authorization Pathways? Time-to-Access of Drugs Licensed Under Conditional vs. Standard Marketing Authorization

PRESENTER: **Vittoria Ardito**
AUTHORS: Ms. Oriana Ciani, James Robinson, Caridad Pontes, Jonas Schreyögg, Lasse Falk

Background: The European Medicines Agency (EMA) uses expedited programs, like the Conditional Marketing Authorization (CMA), to facilitate early access to drugs addressing significant unmet medical needs, based on initial, incomplete evidence that requires further validation. However, while EMA's focus remains on evaluating the risk-benefit profile, national Health Technology Assessment (HTA) bodies in Europe prioritize long-term benefits, cost-effectiveness, and budget impact. This misalignment in incentives and missions raises concerns about whether accelerated EMA pathways translate into quicker patient access at the national level, particularly in systems with extensive HTA and reimbursement procedures.

Objectives: This study investigates whether CMA drugs experience shorter time-to-access, defined as the number of days from EMA approval to national reimbursement decision, compared to drugs with Standard Marketing Authorization (SMA) in three European countries: Italy, Germany, and Spain. The study examines if the intended speed of access facilitated by CMA aligns with national payer timelines.

Methods: We analyzed a sample of drugs approved via the EMA's CMA pathway from 2006 to 2022, matched with a comparable group of SMA drugs based on therapeutic area and centralized approval timing. Data collection included EMA authorization details, drug characteristics, pivotal trial data, and national reimbursement dates from relevant databases in Italy, Germany, and Spain (Farmadati®, Lauer-Taxe® and BIFIMED, respectively). Statistical methods included descriptive analyses, Kaplan-Meier survival curves, and Cox regression models to explore the relationship between authorization type and time-to-reimbursement across countries. The models controlled for factors like drug characteristics (e.g., orphan status, cancer indication) and trial design (e.g., controls, blinding, primary endpoint) to account for factor-specific variations in access.

Results: The study sample included 127 CMA-SMA matched drugs. Results indicate substantial delays in Italy and Spain for CMA drugs compared to SMA drugs, with median time-to-access of 523 days (CMA) versus 455 days (SMA) in Italy, and 682 days (CMA) versus 541 days (SMA) in Spain. By contrast, Germany's reimbursement system allowed for rapid access for both CMA and SMA drugs, with median timelines of 43 days (CMA) and 39 days (SMA). Kaplan-Meier analysis demonstrated country-specific disparities in access timelines, while sequential Cox regression models isolated specific factors that contribute to accelerate or slow reimbursement approvals. Trial characteristics like surrogate endpoints and orphan designation were associated with prolonged access timelines, especially in Italy and Spain where HTA assessments are rigorous.

Conclusions: Despite EMA's accelerated pathways, CMA drugs often experience significant delays in national reimbursement decisions, particularly in countries with stringent HTA requirements. The findings suggest that while regulatory bodies prioritize expedited access, national payer systems may conduct longer assessments due to enhanced clinical and economic uncertainties of CMA drugs. This divergence risks undermining the benefits of CMA pathways. Policy reforms, such as the upcoming Joint Clinical Assessment (JCA) as part of the HTA Regulation in the European Union, aim to harmonize HTA processes across countries, potentially improving access speed. However, without alignment between regulatory and payer perspectives on evidentiary requirements, CMA drugs may continue to face access challenges, limiting their impact on addressing unmet medical needs in a timely manner.

abs-os273 Implementation Costs and Benefits of Innovative Payment Models: An Assessment of Four Case Studies in Europe

PRESENTER: **Matthias Hofer**
AUTHORS: Mikel Berdud, Mireia Jofre-Bonet, Amanda Cole, Sian Hodgson

Background: Member States in the EU are struggling to balance sustainability of health innovation with sustainability of health care systems. Central to this challenge is the role of pricing and payment models for pharmaceutical innovation, as they influence affordability, affect access to products, and provide incentives for directing efforts towards areas of the highest societal value. Therefore, it is important that policymakers have a thorough understanding of Innovative Pricing and Payment Model (IPM) implementation experiences aimed at providing market access solutions to breakthrough pharmaceutical innovation. A key feature of IPM to understand for policy makers is their cost and benefit of implementation. **Objectives:** We aimed to evidence costs and benefits of IPMs along all phases of implementation for key stakeholders (e.g. payers/HTAs, innovators, providers, patients). **Methods:** We developed an IPM cost-benefit evaluation framework adapting implementation assessment models from implementation science literature. The framework breaks down the implementation stages into design,

implementation, maintenance, closing. We selected four case studies, which covered four distinct families of IPM: instalments, revenue guarantees, outcomes-based agreements, and portfolio agreements. We conducted semi-structured interviews with relevant stakeholders involved in the implementation of IPMs. Based on interviews, we collected additional data to quantify, estimate and document IPM implementation costs and benefits. **Results:** In all case studies, IPMs were considered as solutions to specific issues that otherwise cannot be addressed with simple discounts in 'a conventional' contract. These issues included the long-term uncertainty on the product effectiveness, the uncertainty on the use and expected return, or the lack of an existing sufficient market. In some cases (e.g., outcomes-based agreements) the IPM solved the issue and were considered temporary approaches, while in others (e.g., revenue guarantees) the IPM seemed to have a more permanent role in providing access to innovation. All implemented IPM involved increased complexity and a proportional increase in the cost of their implementation for all stakeholders, though to different degrees. We documented significant costs, which are spread over all phases of implementation and included human resources costs, opportunity costs, and transaction costs. We also documented benefits for all stakeholders, which were mainly associated with access and early access to pharmaceutical innovation including health related benefits, anticipated revenue, cost savings and certainty on expected returns. Overall, such benefits are primarily realised during implementation and maintenance phases. **Conclusion:** IPMs help mitigating issues related with access or early access to pharmaceutical innovation in "conventional" agreements, and offer benefits for payers (cost savings and risk-sharing), patients (health-related benefits) and pharmaceutical industry (revenue and risk-sharing). Despite these benefits, IPMs were deemed more complex and more costly than "conventional" agreements and not all stakeholders experience costs and benefits in the same degree, leading to potential implementation conflicts and incentive incompatibilities. The best strategy when implementing an IPM is to make IPMs a win-win for all stakeholders by reducing the burden of IPM implementation and limiting their duration until the issue that motivates its implementation is addressed and benefits have been realised.

abs-os271 Modelled Impact of Risk-Sharing Agreements on Costs for Haemophilia B Gene Therapy in Germany

PRESENTER: **Lasse Falk**
AUTHOR: Jonas Schreyögg

Background: Gene therapies promise new treatment options for rare and often incurable diseases like Haemophilia B. While often among the most expensive drugs in the world, conclusive evidence on (long-term) effectiveness is limited. Accordingly, concerns about the financial sustainability of paying for such treatments are growing. Risk-sharing agreements aim to reduce financial and outcome uncertainties for payers by sharing such risks with the manufacturers. Although such agreements have been in use for a while, details on their implementation and actual impact is scarce due to confidentiality of agreements.

Objectives: We aim to simulate how risk-sharing agreements, specifically the choice of agreement type, influence costs for payers in Germany using the example of a Haemophilia B gene therapy.

Methods: We developed a microsimulation state-transition model to simulate the long-term effectiveness of the gene therapy Hemgenix for men with moderately severe to severe Haemophilia B from age 18 until their death. The disease progression was modelled around haemophilic arthropathy with transition probabilities based on bleeding rates. Costs were calculated on an individual level from the perspective of German payers using publicly available literature and cost data like DRG catalogues, tariff agreements and the Lauer-Taxe. We simulated refund and multi-annual instalment agreements varying payment mechanisms, agreement duration, and treatment failure conditions.

Results: For agreements with a duration of up to 5 years, we find that multi-annual instalment agreements provide larger cost savings potential for payers than refund agreements when treating patients with Hemgenix. For durations of longer than 5 years, refund agreements are the better choice. Over time the cost savings potential of instalment agreements decreases while it increases for refund agreements. The long-term effectiveness of the treatment affects the feasibility of multi-annual instalments. If the treatment effect lasts longer, instalment agreements are also viable for longer agreement durations. Lastly, when considering the risk pool of the German health care system, we find that multi-annual instalments do not provide any savings potential. Employing multi-annual instalments increases costs for payers compared to both refund agreements and standard of care.

Conclusion: Risk-sharing agreements can reduce the costs of gene therapies for payers depending on the treatment durability and the agreement type. The optimal choice of the specific agreement type should be guided by aspects of affordability and risk preference. Additionally, stakeholders need to consider that while many forms of risk-sharing agreements may provide savings, not all of them are able to cover the costs from negotiating agreements and monitoring outcomes. Finally, current regulatory frameworks in Germany limit the choice to refund agreements and may even hinder the adoption of new therapies if the choice is only between standard of care and multi-annual instalments.

abs-os265 What Works for Pharmaceutical Innovation: Key Policy Feature Drivers Behind Global R&D Activities from 42 Countries, 2000-2022

PRESENTER: **Chuanzi Yue**
AUTHORS: Hilde Stevens, Shiri Mermelstein, Mujaheed Shaikh, Xixian Niu, Mathias Dewatripont, Marisa Miraldo

This study explores how various policy incentives drive pharmaceutical innovation, with a novel focus on the mechanisms and interactions of policy features rather than individual policies. Recognising that policy impact can vary due to diverse structural elements, we assess the relationship between these key features and pharmaceutical R&D outcomes across 42 countries from 2000 to 2022. We identify seven core features within six types of pull-and-push policies and evaluate their specific impacts on pharmaceutical R&D activities at the disease-year level, utilising detailed data from the proprietary Cortellis database. Our analysis examines both the extensive margin (number of firms investing in a specific disease area) and the intensive margin (average number of drugs invested in by each firm within a disease area). To mitigate the potential endogeneity of policies implementation in response to R&D activities, we control for disease prevalence, employ fixed effects for disease and year, and instrument our features with disease-specific "sudden shocks," defined by sharp increases in the policy

features' annual changes within six-year intervals. Results indicate that financial benefits, particularly monetary incentives to offset innovation costs or enhance revenue, are consistently associated with increased R&D activity. However, time benefits—policies that expedite regulatory approval—appear to decrease R&D activities at the intensive margin when controlled for conditionality, potentially signalling that time benefits increase R&D primarily through attracting firms with higher R&D productivity. Knowledge-based incentives, such as regulatory or collaborative support, are associated with significant R&D growth, with each 10% increase in knowledge support driving a 10% rise in R&D activities across both margins. Conversely, increases in intellectual property (IP) sharing (requirements to share IP with other innovators or the public) and supply constraints (restrictions on price or distribution) correlate with declines in R&D activity by 49% and 4.6%, respectively, at the intensive margin. Early-stage intervention (policies targeting research rather than regulatory or post-market stages) generally mitigates negative impacts on R&D compared to their late-stage counterparts, underscoring the revenue-driven nature of pharmaceutical innovation. Our findings emphasise the pivotal role of financial and revenue incentives in fostering pharmaceutical innovation. While IP sharing and supply conditions may reduce immediate R&D investment, they hold potential long-term benefits for innovation sustainability and healthcare accessibility. However, these positive impacts in the long run are contingent upon sufficient financial incentives to offset the initial negative effects on R&D activity, underscoring the need for a balanced policy approach that supports both short-term innovation investment and enduring healthcare advancements.

10:30 AM –12:00 PM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

os201 Bali International Convention Centre – Executive Room 2

The Cost of Reaching Zero-Dose Children in High-Priority Areas: Real-World Evidence from Key Immunization Strategies in Pakistan, Ethiopia and Nigeria

MODERATOR: **Laura Boonstoppel**, ThinkWell

DISCUSSANT: **Tewodaj Mengistu**, Gavi, the Vaccine Alliance

abs-os519 Cost to Reach Zero-Dose Children Through Novel Interventions in Kano, Nigeria

PRESENTER: **Salisu Sulaiman**
AUTHOR: Sorbari Igbiri

Vaccines are a powerful tool for saving lives, improving lifelong health, and promoting gender- and wealth-related equity. However, too many children—particularly those in hard-to-reach and conflict-affected settings still miss out on life-saving vaccines. Nigeria has more zero-dose children than any other country in the world, which was further exacerbated by the COVID-19 pandemic. While reaching the global goal of reducing zero-dose children by 50% will require additional investment, there is limited information on the costs of reaching zero-dose children and the potential budget implications. This study was designed to fill that gap in information for Kano State in Nigeria.

This study presents the methods and results on the costs of reaching zero-dose children (those without any vaccinations) in Kano, Nigeria through two new interventions: a new approach to identifying zero-dose children, and training of health care workers to improve vaccination of zero-dose children.

Costs were evaluated through two perspectives: 1) provider costs in a sample of primary healthcare facilities; and 2) household costs. A novel costing methodology that focused on measuring incremental inputs was employed, and surveys were designed to be conducted at baseline, midline and endline to create a panel data set of primary healthcare facilities. Analysis was conducted in both Excel and STATA15.

There was significant variation in the incremental cost per additional zero-dose child across the primary healthcare facilities. Facility costs were compared with current government spending to understand the affordability of different strategies. 70% of households paid for transportation to the facility, spending roughly 500 Naira ($0.30), compared to the average daily income of $1 per day in rural Nigeria. Long waiting and travel times contributed to indirect household costs of reaching facility services. Reducing zero-dose prevalence will require additional investments to reduce household costs and improve access.

Once the study's results are final, we will assess the policy implications for Nigeria on the affordability and feasibility of scaling up these novel zero-dose interventions.

abs-os500 Estimating The Cost of Identifying and Vaccinating Zero-Dose Children in Urban and Rural Geographies in Pakistan

PRESENTER: **Rachel Archer**, ThinkWell
AUTHORS: Zille Huma, Tahmeena Hassan, Ali Turab, Ms. Laura Boonstoppel

While Pakistan has made great strides in improving routine immunization coverage in recent years, almost 400,000 zero-dose children failed to receive a single dose of Penta1 in 2023. Despite Pakistan being one of only two countries where polio is still endemic, many children do not receive their first birth dose of oral polio vaccine (OPV) on time. The Expanded Program on Immunization (EPI) and the Polio Eradication Initiative (PEI) are implementing numerous initiatives to reduce zero-dose prevalence, varying in scale, resource intensity, and whether they are vertical or integrated. However, how these compare in terms of cost and output (zero-dose children reached) is unknown. To fill this evidence gap, we evaluate the cost and output of three key interventions targeting zero-dose children in urban and rural areas in Punjab and Sindh: 1. The cost of integrated outreach activities (IOA), which are intensified outreach activities taking place 3-4 time per year, and compare this to the cost of regular routine outreach and facility-based delivery 1. The cost of OPV house-to-house campaigns (a long-standing component of Pakistan's

PEI, a fully vertical and well-resourced program), and the savings from these being leveraged to identify and track children that have missed out on other injectable vaccines. 1. The cost of reaching zero-dose children using Clinics on Wheels (CoW) in Punjab, which are mobile clinics that deliver integrated primary health care services in urban slums. These are high-cost interventions, though due to their integrated nature, result in large efficiencies on a per person reached basis. We retrospectively estimate the incremental and full financial and economic cost of the selected zero-dose interventions, using an ingredients-based costing approach from a payer perspective. Costs and contextual information are being collected from clinic, facility, district, and province levels. The sample includes 42 facilities, two mobile clinics, seven district EPI offices, and four provincial offices (the EPI and PEI in both Sindh and Punjab). We also assess the financial and programmatic enablers and challenges of each intervention. The output of the interventions will be recorded in terms of zero-dose children identified and vaccinated, the overall number of doses delivered and children vaccinated, and the number of other interventions delivered and persons reached. Our preliminary findings show that two key barriers inhibit facilities' ability to prevent zero-dose prevalence consistently: a shortage of lady health workers, and inadequate transport provision. The additional interventions come with significant additional resources which fill gaps in key activities such as social mobilization. Integrated outreach and CoW reach a higher number of zero-dose children compared with fixed-site delivery, but they are also high-cost interventions. CoW is largely financed by the Government of Punjab, while IOA is heavily reliant on donor funding, which raises important questions around its long-term sustainability. We find that cost savings are incurred by integrating the identification of zero-dose children into OPV campaigns, though once these end, EPI will have to take over these activities. Our findings can guide the PEI and EPI in strategic planning, budgeting, and optimization of these initiatives.

abs-os507 The Cost of Periodic Intensification of Routine Immunization and Mobile Health and Nutrition Teams in the Afar and Somali regions in Ethiopia

PRESENTER: **Firew Bobo**
AUTHORS: Abdi Gari, Mirkuzie Woldie, Ms. Flavia Moi, Girmaye Deye, Ms. Laura Boonstoppel

Ethiopia is home to over 1.1 million zero-dose children, ranking fourth globally in terms of children who have never received a dose of the DTP vaccine. The Ministry of Health has developed a plan to reduce the prevalence of zero-dose children, which covers a variety of strategies. Periodic intensification of routine immunization (PIRI) and mobile health and nutrition teams (MHNTs) are two major strategies being implemented in remote areas where the routine vaccination program lacks the capacity to reach all children. PIRI are intensified outreach activities conducted a few times per year in low-coverage areas to catch up communities missed by regular routine services. MHNTs are active in nomadic areas to deliver a package of maternal and child health services to communities that are far away from health facilities. Communities are visited frequently for a given period of time, and when selected health indicators have adequately improved, they move on to a next underserved community. Both have been implemented in Ethiopia for several years, but the cost of implementing them is not known.

To fill this evidence gap and support Ethiopia's strategy to reach zero-dose children, this study evaluates the cost and implementation of PIRI and MHNTs. Using standardized bottom-up costing methods, we estimate the cost of both strategies as well as regular routine delivery in two regions: Afar in the north, and the Somali region in the east, both predominantly rural regions with pastoralist populations. We collect data from a provider perspective from 6 woredas, including health centers and health posts within these respective woredas. Through key informant interviews at all levels of the health system, we identify programmatic and financial bottlenecks to implementing the two strategies, and document providers' lessons and recommendations. The analysis will result in recommendations for Ethiopia's Ministry of Health and partners.

Our preliminary findings show that on a per dose delivered, and per child reached, both interventions are more costly compared with routine immunization. We find that MHNT results in cost efficiencies due to the integrated nature of the delivery strategy, compared with PIRI where only occasionally limited child health interventions are co-delivered. Key informants at all levels express financial barriers as the key constraint to being able to deliver routine immunization services as per the protocol, primarily manifested in a lack of transport and fuel. Both MHNT and PIRI are perceived as a suitable response to addressing specific health needs of pastoral communities that cannot be reached through regular facility- or outreach-based delivery, though some operational improvements were suggested. However, neither is perceived as having a long-lasting effect to prevent zero-dose prevalence or dropouts in the future.

This study provides valuable cost and programmatic evidence of interventions targeting zero-dose children, which can be compared with other supply and demand-side interventions in Ethiopia as well as similar hard-to-reach areas in other countries. Both interventions are successful at reaching zero-dose children in their specific settings. However, predictable and continuous financing is critical to strengthen the routine immunization program, and prevent zero-dose prevalence increases going forward.

abs-os516 What Are The Costs of Immunizing Zero-Dose Children in Nigeria Through Outreach?

PRESENTER: **Florence Tochukwu Sibeudu**, Nnamdi Azikiwe University
AUTHORS: Ogochukwu Treasure Obionwu, Ms. Christina Banks, Ms. Laura Boonstoppel

Nigeria has the highest number of children who have never received a vaccine dose, termed zero-dose children, in the world, estimated at 2.1 million in 2023. To address this, Nigeria has developed the Zero-Dose Immunization Recovery Plan 2023-2028, and the country has kicked off its Zero-Dose Reduction Plan (Z-DROP) in high-priority areas. Delivering vaccine through outreach is a key strategy of this plan, though the cost of conducting different types of outreach activities, and the requirements to implement outreach effectively are uncertain. This study supports Nigeria's aim to effectively reduce zero-dose prevalence by estimating the cost of conducting outreach activities in high-priority areas in Nigeria.

This retrospective, bottom-up costing study estimates the cost of reaching zero-dose through various outreach strategies from the provider perspective in three high zero-dose prevalence states: Jigawa, Kaduna and Lagos. Jigawa and Kaduna state represent primarily rural remote areas, while in Lagos, outreach activities target urban slums. This study estimates the financial and economic costs of outreach delivery targeting zero-dose children. We estimate the cost per dose delivered, and per zero-dose child reached, and compare the cost and output of the various outreach and facility-based delivery strategies. We collect quantitative cost data from a sample of 50-65 health facilities, as well as the

local government areas in which they are based. We also interview health workers on how outreach is planned, conducted, and funded, any operational and financial barriers that prevent outreach from being implemented as planned, and their insights on what is needed to optimize future outreach efforts aimed at reducing zero-dose prevalence. Outputs are presented as volume-weighted average unit costs.

We find that although outreach protocols are similar across the states, actual implementation practices vary, and Z-DROP is not fully implemented as planned. Outreach are organized from all levels (facilities, wards, local government areas), and take different forms (static and mobile teams). Only mobile delivery organized at local government area level also delivers other primary healthcare services, all others only deliver immunization services. The cost of delivering vaccines through outreach differs considerably across geographic locations, depending on existing health system resources available, and the availability of financing resources. The cost findings will help the government of Nigeria and its partners to tailor planning and budgeting subnationally to reach zero-dose children with interventions that are adapted to their respective contexts.

10:30 AM –12:00 PM MONDAY [Evaluation Of Policy, Programs And Health System Performance]

os209 Bali International Convention Centre – Executive Room 1

Assessing Conditions to Support Interprofessional Health Care Teams

MODERATOR: **Kevin Griffith**, VA Boston Healthcare System

CONVENER: **Krishna D. Rao**, Johns Hopkins University

DISCUSSANT: **Katherine A.P. Zagrodney**, VHA Home HealthCare; IHPME, University of Toronto; Canadian Health Workforce Network (CHWN), University of Ottawa; **Joanne Spetz**, University of California, San Francisco

abs-os546 Interprofessional Team-based Primary Care and Production of Physician Services: Evidence From a Blended Capitation Model

PRESENTER: **Sisira Sarma**, Western University

Background and Aims: An interprofessional team-based primary care approach can improve access to and the efficiency of the primary care system. In Ontario's Family Health Team (FHT), introduced in 2006, physicians are remunerated based on blended capitation, while allied health professionals are salaried. The main mechanism by which FHTs can improve access and efficiency is through task shifting; limited empirical evidence exists on this mechanism. By utilizing longitudinal health administrative data on physicians and their patients, we investigate the impact of FHTs on the quantity and corresponding dollar values of capitated in-basket and out-basket services produced by FHT physicians. We investigate the extent to which in-basket services are provided by own physicians, group/team physicians and outside physicians.

Methods: Physicians practicing in Ontario's blended capitation model (with and without FHTs) between April 2007 and March 2023 and their patients were included in the analyses. Using health administrative data, we constructed several outcomes at the physician level: in-basket services provided to enrolled patients by (i) own physicians, (ii) team/group physicians, (iii) outside physicians; out-basket services provided to both enrolled and non-enrolled patients; in-basket services provided to non-enrolled patients; and in-basket services provided to enrolled patients during regular- and after-hours. We also constructed the corresponding dollar values of these services at fee-for-service rates. We used two-way fixed effects and high-dimensional fixed effects Poisson regressions to analyze the impact of FHTs on the production of physician services.

Results: We used 53,952 physician-year observations (24,984 FHT physicians and 28,968 non-FHT physicians) of 6,386 physicians with a minimum of two years of follow-up for each physician. Our preliminary results show that, compared with non-FHT physicians, FHT physicians provide approximately 100 fewer in-basket services ($2,000–$2,900 at fee-for-service rate) per physician (1000 patient-year) per annum, whereas outside physicians provide approximately 28–62 fewer in-basket services ($2,100–$2,800 at fee-for-service rate). We did not find any difference in out-basket services or in-basket services provided to non-enrolled patients between FHTs and non-FHTs. Analyses by regular and after-hours revealed that FHT physicians provide fewer services during both regular- and after-hours than non-FHT physicians.

Conclusions: Our results reflect task substitutions in Ontario's interprofessional team-based care, leading to fewer services produced by physicians and their patients receiving fewer services from outside physicians. Our findings highlight no incentive effects for providing more out-basket or in-basket services to non-enrolled patients in FHTs. Overall, patients' access to primary care is not hampered by team-based primary care. Whether the substitution effect of the team-based care approach leads to efficiency gains remains to be studied. Since both FHT and non-FHT physicians are compensated with the same capitation and incentives/bonuses, our results indicate that physicians in team-based practices are likely to be better off financially than non-team capitated physicians. However, an interprofessional team-based primary care approach may be desirable from the perspective of physicians, as funding for allied health professionals and administrative staff enables physicians to maintain a better balance between work and leisure activities.

abs-os531 Patient Outcome Differences in the Presence of Nurse Practitioners: A Patient-Shift-Level Analysis in the ICU Setting

PRESENTER: **Kathryn Lee**

AUTHORS: Lara Khadr, Monica O'Reilly-Jacob, Deanna Marriott, Thuy Nguyen, Deena Costa, Marianne Weiss, Olga Yakusheva

Background and Aims: In light of the growing integration of advanced practice providers (APPs; i.e., physician assistants and nurse practitioners) into intensive care unit (ICU) provider teams, concerns have been raised about the quality of APP care. Individual patients' ICU provider teams–the prescribing providers (i.e., physicians, APPs) who participate in each patient's care during every shift–may differ, both across patients during a shift, and for the same patient shift to shift. Yet, our current knowledge of the impact of APPs in the ICU on quality of care and patient outcomes is methodologically limited by unit-level or encounter-level analyses. An individual patient-shift-level analysis is needed to improve causal evidence. We examine whether presence of APPs in a patient's ICU provider team on a shift impacts opioid prescribing and mortality in the ICU. Methods: The study is a patient-shift-level secondary analysis of interprofessional ICU teams in 5 adult ICUs in an academic medical center in the United States. We linked patients to providers within the Electronic Health Records (EHR) data for 22,944 patient admissions from 2018 to 2023. Primary exposure was the presence of one or more APPs on a patient's shift-level ICU provider team, versus physicians only at three separate COVID-19 Pandemic time points: pre-pandemic, phase 1, and phase 2. The outcomes were prescribing of opioids and whether at the next shift (to preserve temporal sequencing) the patient died in the ICU, was discharged from the ICU, or remained in the ICU (base category). Analyses were performed at the patient-shift-level using patient fixed effect regression adjusting for time-variant factors (total number of providers, patient acuity score, and day versus night). Key Results: There was no significant association between patient-shift provider teams that included APPs and the probability of death in the ICU across all time points. However, patients had a 2.5% higher probability of being discharged from the ICU during shifts when APPs were present in the patient-shift provider teams during phase 2 ($p<0.05$). Patients had a higher probability of being prescribed an opioid when APPs were present ($p<0.01$ for all 3 time points). Conclusions and Implications for Policy and Practice: Our findings suggest mixed evidence on whether or not inclusion of APPs in ICU provider teams impacts patient outcomes. Greater use of APPs in critical care teams may be warranted under circumstances that leverage their potential in improving both patient outcomes and the overall functioning of ICU teams.

abs-os524 Physician-Practice Growth After the Interstate Medical Licensure Compact in the United States

PRESENTER: **Ms. Alicia Plemmons**

US physicians' licenses do not transfer between states, which limits their labor mobility compared with other professions. The Interstate Medical Licensure Compact (IMLC) reduces this barrier in participating states. We estimate whether the IMLC expanded physician labor mobility by measuring the number of physician-practice locations and the number of states in which physicians practice using a staggered difference-in-differences model and data from the Centers for Medicare and Medicaid Services. We find a 3% increase in out-of-state practice locations for physicians whose state of primary licensure participates in the IMLC. Further, the IMLC increased the number of states in which physicians practiced, with growth concentrated in participating states, even after accounting for other policy reforms.

abs-os540 Team Incentives and Primary Health Care Team Performance in India

PRESENTER: **Krishna D. Rao**
AUTHORS: Akriti Mehta, Harsha Joshi

Background: High-performing primary health care (PHC) is widely recognized as the foundation for achieving universal health coverage. Team based approaches to delivering primary care services is widely acknowledged as important for comprehensive and coordinated services. To address concerns about PHC team productivity, many low and middle-income countries like India have provide performance incentives to public sector PHC teams. In India, PHC teams - comprised of Community Health Officers, auxiliary nurses, and community health workers - receive team-based financial incentives for achieving benchmarks on a set of fifteen process and service coverage indicators sourced from routine information systems like outpatient visits, pregnancies and births registered, screening and treatment for hypertension and diabetes.

Objective: This study aims to understand if team-based financial incentives are associated with improved facility service readiness and service delivery outcomes of vaccination coverage and hypertension screening. These outcomes require coordinated action among members of the PHC teams. A second aim, is to understand if there are unintended consequences of team incentives – principally, if non-incentivized services

Methods: This study is located in the district of Bhavnagar in the state of Gujarat in India, where a sample of 40 primary health care facilities were surveyed in 2024 to evaluate facility readiness to provide a range of health services. The service readiness measures are based on WHO's Service Availability and Readiness Assessment tool. Catchment population information on service coverage and immunization was sourced from routine data systems. Service readiness and coverage indicators that are incentivized and non-incentivized are compared using regression analysis to understand their relative performance. Bivariate and multivariate analysis is used to understand the association between team incentives and facility service readiness.

Findings: Our preliminary results suggest that there is a weak association between receipt of team incentives and the outcomes of facility service readiness. Further, no significant association was found between services that required coordinated action by PHC teams (i.e. hypertension screening coverage and immunization) and receipt of team incentives. Further, we find that teams underperformed on un-incentivized indicators. Both design and implementation issues are responsible for why team incentives may not have their invented effects. For example, while health workers receive incentives based on a common set of indicators, they are individually paid through different budget lines at differential times, which does not provide a collective sense of accomplishment.

Conclusions: Team performance incentives are an important policy tool to improve team performance. However, in scaled programs team incentives need to be carefully designed and calibrated to avoid attenuation of their effects on team performance, as well as, unintended consequences by depressing performance on non-incentivized activities.

os221 Bali International Convention Centre – Jakarta B

Designing Health Benefits Packages for UHC: Complete Overhaul Vs. Incremental Adjustments. Different Approaches, Processes and Mechanisms

MODERATOR: **Wanrudee Isaranuwatchai**, HITAP

CONVENER: **Gavin Surgey**, Radboudumc

abs-os602 Designing Universal Health Coverage Benefits Packages in Thailand: A Continuous Balance of Comprehensive Overhauls and Incremental Adjustments

PRESENTER: **Pritaporn Kingkaew**, Health Intervention and Technology Assessment Program (HITAP), Ministry of Public Health, Nonthaburi, Thailand

Designing health benefits packages (HBPs) for Universal Health Coverage (UHC) requires a delicate balance between addressing the comprehensive health needs of populations and managing limited resources, particularly in low- and middle-income countries (LMICs). Over the past two decades, Health Technology Assessment (HTA) has been instrumental in shaping HBPs, offering a robust, evidence-informed approach to decision-making. An annual process for Topic Identification, Selection, and Prioritization (TISP) ensures that HBPs address the most pressing population health needs identified by diverse stakeholders. Appraisals of individual health technologies follow, evaluating their cost-effectiveness, budgetary implications, and feasibility before inclusion in the package. To ensure financial sustainability, price negotiations and strategic purchasing mechanisms are employed, enabling the procurement of essential technologies while expanding coverage without overburdening the healthcare system. One notable reform includes the overhaul of prevention programs, including revising service lists and payment mechanisms to address low coverage rates of screening programs effectively. This session will delve into the critical importance of flexibility in designing HBPs, emphasizing how strategic, large-scale reforms can be seamlessly integrated with adaptive, evidence-driven updates to create sustainable and equitable health systems.

abs-os595 Redefining Health Coverage in Kyrgyzstan: Leveraging the WHO Universal Health Coverage Compendium for Primary Care Transformation

PRESENTER: **Gavin Surgey**, Radboud University Medical Center
AUTHORS: Rob Baltussen, Hassan Haghparast-Bidgoli, Baktagul Isaeva, Gerard Joseph Abou Jaoude, Charlie Nederpelt, Saltanat Zhetibaeva

Kyrgyzstan operates a compulsory health insurance system through the Mandatory Health Insurance Fund (MHIF), which provides a set of publicly funded services under the State-Guaranteed Benefits Programme (SGBP). Kyrgyz has recently undertaken a process to prioritise and define its list of services offered under its SGBP. This involved a whole package review of health services using evidence-informed deliberative processes (EDPs), comprise of several steps, and Health Technology Assessment (HTA). It made use of the WHO Universal Health Coverage Compendium (UHCC) as the architecture of services for which we costed all the potential services options under the WHO UHCC The UHCC is a novel and innovative database of health services and intersectoral interventions designed by the WHO, aimed at assisting countries in designing and/or revising their health benefit packages. It explicitly aims to foster integrated service delivery, and a key innovation is a structured architecture that considers both foundations of care and referrals to promote linkages across health system levels. The Compendium focuses on clinical health services and includes a list of over 3700 health actions across different health areas. This presentation reports on the process to revise the primary healthcare SGBP in Kyrgyzstan. It will highlight the use of the UHCC in the mapping, costing, cost-effectiveness review and prioritisation of health services for the Kyrgyzstan SGBP. This is the first country experience of using the UHCC for a comprehensive benefit package revision. It will also show how the costing model designed for the UHCC was used to estimate costs of the full benefits package.

abs-os604 Setting Priority Topics for Health Technology Assessment Studies to Optimize the Benefit Packages in Indonesia

PRESENTER: **Auliya A. Suwantika**

Background Health technology assessment (HTA) is critical in selecting healthcare service benefit packages for Indonesia's national health insurance program. Established in 2014, the Indonesian Health Technology Assessment Committee uses HTA to evaluate health technologies in the potential inclusion of benefit packages. **Aim** This study aimed to identify priority topics for adaptive HTA studies in Indonesia. This adaptive approach was applied to leverage existing data, previously published evidence, and simplified methodologies in expediting assessments without compromising the principles of transparency and evidence-based rigor. **Methods** Multi-criteria decision analysis (MCDA) was applied to identify priority topics for adaptive HTA studies in Indonesia by considering various factors such as disease burden, clinical effectiveness, cost, acceptance, and equity. **Results** Integrating MCDA with an evidence-informed deliberative process could enhance decision-making to optimize benefit packages by involving stakeholders in a structured manner, ensuring diverse perspectives, and making decisions more transparent and legitimate. By applying MCDA, health authorities could align the prioritization of technologies with national health objectives and the local disease burden, streamlining which technologies undergo adaptive HTA. The process could foster a balanced assessment where scientific evidence and stakeholder values converge, promoting broader acceptance and credibility of the decisions. Incorporating an evidence-based deliberative process into the adaptive HTA framework could ascertain that even expedited procedures uphold a fair and participatory evaluation norm, which is essential for maintaining public confidence and adhering to policy. **Conclusions** Adaptive HTA

offers a strategic alternative, reducing the time and resources required by leveraging existing data and simplified methodologies. Given the increasing need for HTA studies in Indonesia, identifying priority topics for adaptive HTA studies is crucial to accelerating the decision-making process and upholding the core values of equity, efficiency, and evidence-informed policy.

10:30 AM –12:00 PM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

os65 Bali International Convention Centre – Denpasar A

Incorporating Implementation Within the Economic Evaluation of Health Technologies: A way Forward

MODERATOR: **Robert Heggie**, University of Glasgow

abs-os565 A Framework, a Spectrum and a Trap Characterising and Measuring Implementation Cost, and Balancing Research Quality With Speed of Implementation

PRESENTER: **Ms. Caroline S Clarke**, University College London (UCL)
AUTHORS: Duncan Gilbert, Ms. Rachael Hunter, Victoria Serra-Sastre, Ian Shemilt, Sophie Merrick

ABSTRACT:

Background: This presentation addresses two areas of tension regarding implementation (or de-implementation) of effective and cost-effective (or sub-optimal) innovations. Challenges in both of these areas arise due to lack of information or evidence around specific aspects that overlap implementation and economic evaluation. We present here case studies and examples of how to overcome these issues.

Methods: The first area concerns the tension when performing an analysis that requires multiple perspectives. These could be: a national health technology assessment (HTA) body that uses positive cost-effectiveness thresholds (e.g. £20,000/QALY gained for the National Institute for Health and Care Excellence (NICE) in England); and a local service provider, preferring budget impact analysis including implementation costs, and process outcomes, e.g. reduced patient waiting times for treatment or diagnosis with zero overall cost increase. When performing an analysis, especially in an academic or publicly funded study, it is likely that the audience will be broad and so the analytical team wishes to address multiple perspectives within one framework and using one main dataset. We provide a framework for approaching this and determining and measuring implementation costs.

The second area concerns the tension between getting innovations into practice as quickly as possible so that patients can benefit, versus taking sufficient time to ensure that the optimal therapy regimen is the one approved, to avoid inadvertent health detriment. It can be very difficult to undo an implementation process once it has taken place, for various economic, political and logistical reasons, so any damage done in system terms can persist until the optimal regimen is approved and implemented, if this ever happens. We discuss case studies and possible ways forward to avoid this issue.

Results: Different types of intervention in different contexts can lie along the implementation spectrum, from pharmaceutical innovations that slot easily into the clinical pathway, to complex innovations or major system change (MSC) that substantially alter patient and staff behaviour, service delivery processes, physical locations where care is carried out, and so forth.

HTA approaches have historically focused more on pharmaceutical innovations. Complex interventions and MSC on the other hand are relative newcomers as subjects of cost-effectiveness evaluations, and they can carry a heavier implementation burden.

Other new uses of HTA include beginning to allow post-marketing changes in pharmaceutical approvals that are not driven by the manufacturer. This can be very important in de-implementation or de-escalation of sub-optimal therapies as part of the wider context of ensuring value for money of health care services by considering the opportunity cost of persevering with sub-optimal therapy pathways, while also considering a range of stakeholder needs.

Conclusions: Where evidence is lacking regarding implementation of the most cost-effective regimen, this can be due to analysis gaps, including inappropriate exclusion of stakeholders who bring essential insights but are overlooked, or exclusion of alternative versions of the treatment pathway that could provide better value for money and patient outcomes. We hope that illustrating these issues will help us to overcome them and improve patient care and outcomes.

abs-os559 Evaluating Complex Interventions: Methods in Health Technology Assessment

PRESENTER: **Abdolvahab Baghbanian**
AUTHORS: Drew Carter, Tracy Merlin

ABSTRACT:

Background: Health Technology Assessment (HTA) methods have been developed to support evidence-informed policy-making through systematic assessment of the comparative value and costs of health interventions and programs. However, many healthcare interventions are complex in ways that pose challenges to using conventional HTA methods. This scoping review collated and synthesised international approaches to the HTA of complex interventions, including identifying assessment criteria, types of evidence and the domains of value that are

most favoured.

Methods: A systematic scoping review was conducted using Joanna Briggs Institute guidelines, Arksey and O'Malley's six-stage framework and recent advances in scoping review methodology. Seven electronic databases, grey literature, three leading HTA journals and backward citations were used to search complex intervention HTA records written in English from January 2000 to December 2023. Supplementary searches were also conducted to identify actual HTA products from specific countries. The Population, Concept, Context (PCC) framework guided the literature selection process, with a two-phase screening process and subsequent narrative synthesis. The PRISMA-ScR informed reporting. Independent screening by two reviewers ensured the accuracy of inclusion, and data extraction followed a customised form grounded in the HTA-core model.

Results: A total of 10684 references yielded 35 records from twelve countries. The review identified two clusters of research on HTA of complex interventions: methodological orientation and conceptual models (n=19) and actual HTA representation (n=16). Several evaluation criteria and domains were used or recommended for use that extended beyond HTA-core domains. Three distinct HTA approaches emerged: the integrative approach, highlighted in methodological guides and theoretical literature, and either the parallel or sequential approaches, largely emphasised in practical HTAs. In theory, equal weight is given to various HTA domains for complex intervention assessment, but in actual HTA practice, the scope and specificity of domains vary across reports, with different countries exhibiting variations in the significance assigned to different domains. In practice, cost and clinical effectiveness, and organisational aspects predominate in complex intervention evaluation, albeit with gradually increasing emphasis on a technology's description, intended use, safety and patient and social aspects over a decade ago.

Conclusion: This scoping review underscored the multidimensional nature of HTA of complex interventions, revealing diverse methodological and practical orientations across evaluation criteria and domains. While theoretical guidance and methodological frameworks suggest one approach, practical applications of HTA often adopt another, reflecting persistent discrepancies in implementation and warranting further investigation. The review identified emerging trends in integrative, sequential and parallel approaches to complex intervention HTA that extend beyond the traditional HTA core model to incorporate broader contextual and implementation factors. Challenges remain in consensus on specific metrics and evidence elements for complex health interventions. However, acknowledging these multifaceted aspects in HTA processes can enhance evidence-informed decision-making.

abs-os554 What Methods are Currently Available for Incorporating Implementation Considerations Within the Economic Evaluation of Health Technologies?

PRESENTER: **Robert Heggie**
AUTHORS: Olivia Wu, Hanin Kamaruzaman, Kathleen A Boyd

ABSTRACT:

Background: When clinically effective, cost-effective health interventions are not fully implemented in clinical practice, population health suffers. Economic factors are among the most commonly cited reasons for suboptimal implementation. Despite this, implementation and economic evaluation are not routinely performed in conjunction with one another. This review sought to identify and describe what methods are available for researchers to incorporate implementation within economic evaluation, how these methods differ, when they should be used, and where gaps remain. **Methods**: We conducted a scoping review using systematic methods. A pearl-growing approach was used to identify studies. References and citations were identified using Web of Science and Scopus. We included for review any study that contained terms relating to economic evaluation and a series of implementation-related terms in the title or abstract. The search was conducted and validated using two independent researchers. **Results**: Our review identified 42 unique studies that included a methodology for combining implementation and economic evaluation. The methods identified could be categorized into four broad themes: (i) policy cost–effectiveness approach (11 studies), (ii) value of information and value of implementation approach (16 studies), (iii) mixed methods approach (6 studies), and (iv) costing approach (9 studies). We identified a trend over time from methods that adopted the policy cost–effectiveness approach to methods that considered the trade-of between the value of information and value of implementation. More recently, mixed methods approaches to incorporate economic evaluation and implementation have been developed, alongside methods to define, measure and cost individual components of the implementation process for use in economic evaluation. **Conclusion:** Our review identified a range of methods currently available for researchers considering implementation alongside economic evaluation. There is no single method or tool that can incorporate all the relevant issues to fully incorporate implementation within an economic evaluation. Instead, there are a suite of tools available, each of which can be used to answer a specific question relating to implementation. Researchers, reimbursement agencies and national and local decision-makers need to consider how best to utilize these tools to improve implementation.

12:00 PM –1:30 PM MONDAY [Social Events]

Bali International Convention Centre

Lunch: Served in both Exhibition Gallery (Level 2) and Exhibition Hall (Level 1)

12:00 PM –1:30 PM MONDAY [Social Events]

Bali International Convention Centre – Jakarta A

IHEA Members' Meeting

1:30 PM –3:00 PM MONDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Denpasar B

Navigating Insurance Design and Enrolment Behavior

MODERATOR: **Hema Bhatt**,

Ind-1630 The Impact of Increasing Access to Government Subsidies on the Demand for Psychotherapy and Pharmacotherapy

PRESENTER: **Noura Saba**, Macquarie University

AUTHORS: Anam Bilgrami, Henry Cutler, Yuanyuan Gu

Meeting the increasing demand for mental health care is a major challenge facing healthcare systems. This study aims to assess the impact of a 2020 national policy that increased access to government subsidies, on the demand for psychotherapy and pharmacotherapy in Australia. Using a large, national, linked administrative dataset, we used regional differential exposure measure of mental health care access to create a treatment and control group. We estimated the treatment effects using dynamic difference-in-difference. We find that increasing the number of subsidised sessions impacted the demand for types of mental health treatment differently. For services delivered by psychologists, service use was initially not impacted, but later experienced a short-term increase before dissipating in the later quarters. There was an immediate increase in the use of General Practitioners (GPs) services, but a reduction in psychiatric services in 2022, particularly for low-income earners. We find a delayed and positive spillover effect on the use of anti-depressants, which remained significant in the late post-expansion quarters. We did not find an impact on prescriptions for anxiolytics and anti-psychotics. A nuanced approach to policy design is therefore needed to address the direct and indirect effects of subsidies and to ensure efficient distribution of resources.

Ind-2482 Default Enrollment for Dual-Eligible Special Needs Plans (D-SNPs)

PRESENTER: **Joseph G.P. Hnath**

AUTHOR: Vilsa E. Curto

Introduction Dual-eligible beneficiaries (duals), who qualify for both Medicare and Medicaid in the U.S., represent a critical population due to their size (12 million in 2020), sociodemographic composition (lower income and three times more likely to be Black or Hispanic compared to non-dual Medicare beneficiaries), and health risks (double the Medicare spending and triple the likelihood of reporting poor health compared to non-duals). Historically, fragmented care resulting from poor coordination between Medicaid and Medicare has led to suboptimal outcomes for duals. Integrated care programs, particularly Medicare Advantage (MA) Dual Special Needs Plans (D-SNPs), aim to address these challenges. D-SNPs account for the largest enrollment and plan offerings among integrated care models. A policy allowing MA organizations to default duals from Traditional Medicare into D-SNPs seeks to increase enrollment, yet no prior research has evaluated this policy or the causal effects of D-SNP enrollment on health and utilization outcomes. Our research questions are to estimate both (1) the causal effect of the default enrollment policy on D-SNP enrollment and (2) the causal effect of D-SNP enrollment on health and utilization outcomes.

Methods We use data from 2009–2019, combining four sources: Medicare enrollment/demographics (MBSF), Medicaid managed care enrollment (MAX/TAF), D-SNP default enrollment approvals (via Freedom of Information Act request), and Medicare inpatient utilization (MedPAR). To evaluate the default enrollment policy, we employ a difference-in-differences design, specifically the *Two-Stage Difference-in-Differences* method by Gardner *et al.*, which accommodates staggered treatment timing in repeated cross-sections. To estimate the causal effect of D-SNP enrollment on outcomes, we use an instrumental variables design leveraging exogenous variation in D-SNP enrollment induced by the default policy. This approach applies the *Instrumented Difference-in-Differences* method by de Chaisemartin *et al.*, complemented by a novel three-stage method extending Gardner *et al.*'s framework.

Results In six states, approximately 135,000 beneficiaries were eligible for default enrollment, which increased the probability of D-SNP enrollment by 14.9 percentage points (95% CI: 6.0–23.9), representing a nearly 160% increase relative to the sample mean of 9.4%. Ongoing analyses incorporate pre-Medicare utilization data to assess adverse selection dynamics with defaults and implement an instrumental variables research design to estimate the causal effects of D-SNP enrollment on health and utilization outcomes.

Conclusion While defaults significantly increase D-SNP take-up relative to baseline levels, their effect size is smaller compared to other health insurance contexts with defaults, such as Medicare Part D or the Dutch health system. This study offers broader health economics insights into designing effective health insurance enrollment mechanisms and promoting efficient care delivery under managed competition and capitated financing models.

Ind-2503 The Impacts of Copayments at General Practitioner (GP) Consultations on Essential Annual Health Screenings in Australia

PRESENTER: **Paul Kuwornu**

Background Chronic diseases remain a leading cause of mortality globally. General health screenings/check-ups are among the most effective ways to reduce the risk of chronic diseases. However, many individuals do not engage in check-ups for different reasons. For example, charging for health check-ups may reduce the use of these services. Although Australia's healthcare financing policy promotes "free" general practitioner (GP) services, there is an emerging view that this "free" GP services may be leading to poorer quality of care. The proponents of this view argue that excessive price competition among GPs may result in shorter consultation times and inhibit GPs from focusing on preventive health screening. The study's objective was to determine if there were differences in the uptake of health check-ups among adults who always made copayments at GP consultations (copay group) compared to those who never make copayments (no pay group). **Methods** The study used unbalanced panel data from the Household, Income, and Labor Dynamics in Australia (HILDA) survey, covering three (2013, 2017, and 2021) waves. The sample was restricted to individuals older than 40 years with 2+ GP visits in the year preceding the survey dates, resulting in N = 17,998 observations. The outcome variable measured whether an individual had undertaken annual check-ups/screening. Our identification strategy used a doubly robust causal inference approach, which combined propensity score weighting and g-computations. The target estimand was the average treatment effect. We included six different robustness checks ranging from methods that used alternative specifications of the sample to those that employed propensity score matching instead of weighting. To lessen the risk of omitted variable bias, we control for 25 potential confounders in the propensity score models, including socio-demographics, health conditions and expenses, and personality traits. We also conducted a sensitivity analysis for unmeasured confounding using the E-value approach. **Results** There was excellent balance between the two exposure groups after propensity score weighting, with standardized differences below 0.1 for all the 25 potential confounders. The result showed that although individuals in the two exposure groups had a similar average number of visits to GPs (1.54 for copay group vs. 1.55 for no pay group), those in the copay group were 23% less likely to miss essential annual health screenings compared to the no pay group (relative risk, 0.77; 95% CI, 0.67 - 0.87). The results remained similar across all robustness checks. The E-value result assures that it was unlikely for an unmeasured confounder to explain away the effect estimates. **Conclusions** Although this finding opens the possibility that copayments might be influencing the uptake of essential annual health check-ups, understanding the causal mechanisms would require further investigations beyond our study since we could not account for the characteristics of the GP consultations. As efforts are made to promote preventive health among Australians, careful attention needs to be paid to crafting the right mix of GP funding models to spur the uptake of health check-ups.

Ind-1147 The Effect of Long-Term Care Insurance on Medical and Long-Term Care Utilization: Focusing on Institutional Care Eligibility

PRESENTER: **Hin Moi Youn**

Background As the global population continues to age, the rising demand for social care for older people has become a critical policy agenda. South Korea, recognizing the urgency of this issue, was one of the first countries to implement public long-term care insurance (LTCI) in 2008. This initiative was designed to address the increasing demand for long-term care services while containing the rapid growth of medical expenditures. Given the growing need to provide appropriate and affordable care for older people, ensuring the sustainability of the LTCI and National Health Insurance (NHI) systems has become more critical than ever. This study aims to evaluate the effects of LTCI on medical and long-term care utilization, with a particular focus on institutional care eligibility (LTCI level 2) among older people. It seeks to clarify the inter-relationship between different types of care and offer insights into the development of long-term care policies. **Methods** The study utilized a representative sample from the National Health Insurance Senior Cohort Database covering 2008 to 2013. A sharp regression discontinuity design was employed to estimate the impact of expanded LTC benefits on medical and LTC utilization. Participants were selected based on their preliminary LTC scores, which determined their eligibility for treatment. The analysis relied on non-parametric local linear regression estimates with triangular kernel weights and a bandwidth of 3.0. Additional falsification and sensitivity analyses were conducted to validate the study design. **Results** The analytic sample consisted of 8,036 LTCI recipients with LTCI levels 2 and 3 from 2009 to 2013. Among them, 2,908 (36.2%) were in the treatment group (above the cutoff), while 5,128 (63.8%) were in the control group (below the cutoff). The findings revealed that level 2 benefits significantly reduced total medical expenditures by 1,778,700 won (29.5%, $p<0.0001$). A substantial decrease was observed in acute hospital care expenditures, which fell by 1,576,300 won (49.2%, $p<0.0001$), compared to a modest reduction in LTC hospital care expenditures of 208,300 won (7.4%, $p=0.568$). For LTC utilization, institutional care costs increased by 3,178,600 won (100.7%, $p<0.0001$), with an additional 93.8 days of institutional care (103.1% increase, $p<0.0001$). Conversely, home care costs decreased by 711,600 won (22.8%, $p<0.0001$), with 43 fewer days of care (30.5% decrease, $p<0.0001$). Overall, total expenditures for medical and LTC increased by 688,300 won (5.6%, $p=0.034$). **Conclusions** This study provides causal evidence of LTCI's impact on medical and LTC utilization, particularly highlighting the effects of expanded institutional care benefits. The findings indicate substitutive relationships between hospital inpatient care and institutional care, as well as between home care and institutional care. Increased access to institutional care is associated with a significant rise in LTC expenditures, reflecting high demand for such services. Policymakers should prioritize understanding the needs of the aging population and optimizing LTCI program designs to enhance efficiency, control costs, and improve the health and well-being of older adults in an era of rapid aging.

abs-os532 Modeling Differences in Medicare Advantage Enrollment by Race Using a Hybrid Choice Model

PRESENTER: **Adam Atherly**, Virginia Commonwealth University
AUTHORS: Bryan Dowd, Eline M. van den Broek-Altenburg

Background: The U.S. Medicare program has a very limited benefit package with high out-of-pocket cost sharing in the traditional fee-for-service (TM) Medicare program. An alternative, Medicare Advantage (MA), offers reduced cost sharing and enhanced benefits, along with limited provider networks and care management. MA has been gaining market share relative to TM among the eligible US population, particularly among racial minorities. The reasons for the higher enrollment among racial minorities are unclear. Prior work has found that the higher enrollment rate among racial minorities is not a function of either plan or beneficiary characteristics, but is rather a function of differences in preference weights for plan attributes. Yet this finding begs the question of why preference weights should vary by racial group. In this paper, we attempt to explain the differences in enrollment rates by race. We examine the importance of unobserved factors to explain the differences in choice decisions by race.

Data: We use the 2020 Medicare Current Beneficiary Survey, which is a representative sample of the Medicare population that contains data on beneficiary demographics, health, income and other attributes. We combine this with CMS data on plan payment levels, star rating and measures of market competition. Study exclusions include individuals less than age 65, nursing home residents and full-time workers. Total sample size is 8,211

Methods: Analytically, we use a hybrid choice model. We distinguish between classes of individuals using a structural equation model, utilizing survey variables on food insecurity, use of preventive care and understanding of Medicare, then model choice decisions using a mixed logit model. The choice model has four options: TM (alone), TM with Part D, TM with Part D and Medigap and MA+Part D. In the latent choice model, we control for individual characteristics, including age, gender, health status, income; in the mixed logit, we include plan characteristics (premium, drug coverage, coinsurance rates for Part A and Part B).

Key Findings: We find three distinct classes within the Medicare population. Class 1 (23% of the population) is characterized by a higher probability of being white, college educated and having a younger age. Class 2 (34% of the population) was more likely to be non-white, while Class 3 (42% of the population) was older and poorer. Class 1 was the least premium sensitive, while Class 2 has the largest premium elasticity, the higher marginal utility associated with prescription drug coverage and the largest response to out-of-pocket premiums. Class 3 placed a lower value on drug coverage but was more sensitive to outpatient cost sharing..

Conclusions: The Medicare population is characterized by three distinct classes. Higher enrollment in MA plans by minorities reflects unobserved characteristics associated with higher marginal values for prescription drugs and a greater sensitivity to cost sharing. MA plans offering drug coverage and lower out-of-pocket cost sharing, which drives the higher enrollment numbers.

1:30 PM –3:00 PM MONDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Jasmine

Mental Health: Treatment and Outcomes

MODERATOR: **Léon Gerardo Kreis**, "University Medical Center Hamburg-Eppendorf, Department of Health Economics and Health Services Research"

Ind-354 Mental Health As a Determinant of Work: A Scoping Review on the Impact of Mental Health on Precarious Employment

PRESENTER: **Claire de Oliveira**, Centre for Addiction and Mental Health
AUTHORS: Margaret Jamieson, Sergio Lopez

Abstract

Background: While many studies have examined the impact of employment and other related work outcomes on mental health, the reverse – the impact of mental health on employment – has received less attention. Poor mental health can serve as a barrier to obtain and maintain employment and play a key role in shaping poor labour market outcomes such as productivity, absenteeism, and reduced earnings. Poor mental health can also negatively impact the job search process as it can lead to decreased levels of energy and reduced availability, resulting in lower motivation and capacity to actively engage in job search activities. Furthermore, employers are less likely to hire people who have health problems, resulting in reduced probability of employment success. Several reviews have summarised the impact of precarious employment on mental illness; however, to date, no reviews have synthesised the existing evidence on the reverse relationship.

Objectives: The objectives of this scoping review were to ascertain the existing literature examining the impact of mental health on precarious employment as well as to describe, synthesize, and critically appraise it.

Methods: A scoping review was conducted using established methods. MEDLINE, Embase, PsychINFO, Business Source Premier, EconLit, and Web of Science were searched from January 1st, 1980, to August 30th, 2024. Relevant searches were also undertaken in Google and specific websites of interest and the references of key papers were examined. Relevant data were extracted on all studies and the quality of each study was assessed, namely whether studies examined simple associations between mental health and precarious employment or whether they attempted to address causal inference and accounted for endogeneity and/or unobserved heterogeneity. Evidence was synthesised by type of mental disorder using a narrative synthesis; summary tables were used to describe the findings.

Results: After duplicates were removed (n = 6,412), the search yielded 9,693 unique records; after reviewing titles and abstracts and confirming eligibility with full text review (n = 40), 17 relevant studies were included. Among these studies, many examined the reciprocal relationship between mental health and precarious employment; however, few studies specifically focused on mental health as a determinant of precarious employment. The research team is currently undertaking data extraction, quality assessment, and evidence synthesis.

Discussion: Despite a large body of literature examining the impact of precarious employment on mental health and mental health outcomes, less attention has been paid on examining mental health as a determinant of precarious employment. Preliminary evidence indicates that people with poor mental health are at a higher risk of precarious employment. However, more high-quality, causal inference studies are needed to inform clear policy recommendations. Nonetheless, it is important to ensure that workplaces and job roles consider workers' mental health and how best to accommodate workers with pre-existing mental health conditions. Improving access to mental health services both in and out of the

workplace may also support workers living with mental health conditions.

Ind-2816 The Dual Impact of Social Isolation and Internet Isolation on Depression and Loneliness in Older Adults: A Comparative Analysis of Europe and Asia

PRESENTER: **Shang Gao**, Jilin University
AUTHORS: Yan Xu, Xihe Yu, Liangwen Ning

Abstract

Background

Social isolation and internet isolation are critical public health issues, particularly for older adults facing life changes like retirement or widowhood. Social isolation, defined as reduced engagement in interpersonal relationships, and internet isolation, characterized by a lack of access to or use of the internet, have both been linked to adverse mental health outcomes such as depression and loneliness. These effects are compounded in low- and middle-income countries (LMICs), where internet access is limited, compared to high-income countries (HICs), where digital engagement is higher but gaps persist among older adults. By analyzing data from the English Longitudinal Study of Ageing (ELSA) and the China Health and Retirement Longitudinal Study (CHARLS), this study provides a comparative perspective on the independent and combined effects of social and internet isolation across different socioeconomic and cultural contexts.

Methods

Data from ELSA and CHARLS were analyzed using Cox proportional hazards regression to estimate the effects of social and internet isolation on depression and loneliness. Social isolation was defined as being unmarried, living alone, infrequent contact with children, or non-participation in social activities. Internet isolation was defined as no internet use in the past month. Random-effects meta-analysis was conducted to pool results and assess heterogeneity between the two cohorts.

Results

Both social and internet isolation independently increased the risks of depression and loneliness. In ELSA, social isolation was more strongly associated with depression (HR = 1.251, 95% CI [1.000–1.567]) than internet isolation (HR = 1.285, 95% CI [1.045–1.581]), while internet isolation alone had a greater impact on loneliness (HR = 2.553, 95% CI [1.813–3.595]) compared to social isolation (HR = 1.776, 95% CI [1.268–2.486]). Dual isolation exhibited the highest risks for both outcomes. In CHARLS, social isolation significantly increased the risk of both depression (HR = 1.397, 95% CI [1.095–1.782]) and loneliness. Meta-analysis revealed consistent trends across datasets, with dual isolation posing the greatest risk for both outcomes (HR = 2.096, 95% CI [1.078–4.074]).

Conclusions

Social and internet isolation are significant predictors of depression and loneliness in older adults, with varying impacts across cultural and socioeconomic contexts. While social isolation exerts a stronger influence on depression, internet isolation has a greater effect on loneliness, particularly in developed contexts like the UK. Dual isolation amplifies these risks, highlighting the need for integrated interventions that address both interpersonal and digital connectivity to improve mental health outcomes in aging populations.

Ind-456 Association of Multidimensional Poverty and Depression Among Elderly in India

PRESENTER: **Suraj Maiti**
AUTHORS: Sanjay K Mohanty, Jyoti Shankar Hota, Jyoti Das

Background Poverty and mental health among the elderly are globally neglected public health concerns, with high prevalence in developing countries. With a rapidly growing elderly population and socio-demographic changes in India, it disproportionately affects the poor and vulnerable. The older adults are at higher risk of multiple deprivation and poor mental health due to economic vulnerability, social isolation, and greater need for healthcare. Though studies on the association of poverty and mental health have been increasingly available, there are limited studies that have examined the association of multidimensional poverty and mental health. In low- and middle-income countries (LMICs), both the reduction of multidimensional poverty and the integration of mental health in public health programmes for the elderly remain neglected agendas. In this context, this paper examines the association of multidimensional poverty and depression among older adults in India. **Data and Methods** We utilized the microdata from the Longitudinal Aging Study in India (LASI), which comprehensively collects the social, health, and economic well-being of older adults in India. LASI Wave 1 collected information from 73,396 individuals using a multi-stage stratified area-probability cluster sampling design, of which 29,300 elderly individuals aged 60 and above were analyzed. Depression among older adults, as measured by the CES-D scale, is the primary outcome variable. The multidimensional poverty level of the older adults is the key independent variable. A total score is calculated on a scale of 0 to 10, with a score of 4 or more being classified as depressive. The Multidimensional poverty was estimated using the Alkire-Foster methodology, which employs a dual cut-off counting approach to categorize individuals as either multidimensionally poor or non-poor. **Results** We estimated that 61% (95% CI: 59.3-62.1) of the older adults were multidimensionally poor, with an associated Multidimensional Poverty Index (MPI) of 0.303 (95% CI: 0.295-0.312). The prevalence of depression, measured by the Centre for Epidemiological Studies Depression Scale (CES-D), was 12 percentage points (pp) (AME: 0.12; 95% CI: 0.097-0.143) higher among the multidimensionally poor than non-poor individuals. The findings are robust to an alternative measure of depression using the Composite International Diagnostic Interview Short Form (CIDI-SF) scale. Significant predictors of elderly depression were age, sex, residence, and marital status. **Conclusion** The high prevalence of depression among the multidimensionally poor elderly in India reflects a complex mix of socioeconomic, psychological, and health-related factors. There is a need for a comprehensive approach to address elderly poverty and mental health, integrating economic support, improved access to healthcare, and enhanced social engagement. We recommend expanding social welfare programs to incorporate mental health services targeted at vulnerable groups in rural areas and regions

with high depression prevalence.

Ind-544 The Long-Term Impact of ADHD on Children and Adolescents Health-Related Quality of Life: Results from a Longitudinal Population-Based Study

PRESENTER: **Ha N.D Le**, Deakin University
AUTHORS: Courtney Kelly, David Coghill, Ms. Lisa Gold

Background Attention-deficit/hyperactivity disorder (ADHD) is the most common neurodevelopmental disorder. While much is known about the functional and academic impacts of ADHD, impacts on long-term health-related quality of life (HRQoL) are less well-documented. **Aims:** To explore, in children aged 4-17 years, associations between clinical ADHD symptoms and (1) children's HRQoL; (2) whether child internalising or externalising problems attenuate this association; and (3) factors contributing to this association. **Methods** Data were drawn from the Longitudinal Study of Australian Children at child ages 4-17 years. Clinical ADHD symptoms (e.g. score > 8) were measured using the hyperactivity scale from the Strengths and Difficulties Questionnaire (SDQ). Internalising or externalising problems were classified as children with scores ≥ 5 on the Emotional Problems and scores ≥ 4 on the Conduct Problems scale on the SDQ, respectively. Children's HRQoL was measured using the Pediatric Quality of Life Inventory (PedsQL). Linear mixed models were used, adjusting for child and family factors. **Results** Compared to those with no ADHD symptoms, children with ADHD symptoms had significantly lower HRQoL across all domains from 4-17 years (mean difference=7.65, 95%CI 6.1 to 9.2). Internalising and externalising problems slightly attenuated the association between ADHD symptoms and children's HRQoL (mean difference =4.93, 95%CI 3.4 to 6.4). Being a female, or having autism, or other medical conditions, or taking ADHD/ADD medication or caregiver having mental health problems was associated with poorer HRQoL while having 2 or more siblings was associated with better HRQoL. **Conclusion** ADHD clinical symptoms are associated with poorer children's HRQoL from 4-17 years. Given that co-occurring medical conditions and poor caregiver mental health are associated with poorer child HRQoL, ADHD treatment needs to identify and address co-occurring conditions and parental mental health. 2

Ind-956 Gender Identity and Mental Health Inequalities 2001-2022: Population-Level Evidence From an Australian Cohort Study

PRESENTER: **Karinna Saxby**
AUTHORS: Zoe Aitken, Ricki Spencer, Dennis Petrie, Ian Down, Sara Hutchinson Tovar, Glenda Bishop

Background: Existing evidence indicates that trans, nonbinary, and gender diverse (TGD) people experience poorer mental health relative to cisgender populations. However, a lack of information on gender diversity in longitudinal surveys has hindered efforts to understand how TGD mental health inequalities are changing over time. With newly available information on gender diversity within Australia's largest national longitudinal study, we aimed to provide the first national estimates of temporal trends in TGD inequalities in mental health.

Methods: We used the 2001-2022 Household, Income and Labour Dynamics in Australia (HILDA) survey, a large, national probability sample of Australian adults. Using questions about sex at birth and gender identity, asked in the 2022 wave, we compared temporal trends in mental health among TGD and cisgender respondents. Mental health was measured using the five-item Mental Health Inventory (MHI). Adjusting for age, income, and other observable characteristics, we calculated annual population-weighted estimates of mean MHI scores for TGD and cisgender respondents.

Findings: Across the 22-year period, TGD respondents consistently reported poorer mental health than cisgender respondents. Prior to 2010, differences in MHI scores were more variable but TGD MHI scores were generally lower than cisgender respondents. From 2010 onwards, there was a trend of widening inequalities, with TGD-cisgender MHI inequalities ranging from -5.0 (95%CI -0.6;-9.4) to -12.0 (95%CI -15.1;-9.0), indicating clinically relevant differences in mental health.

Interpretation: TGD-cisgender mental health inequalities are increasing in Australia, with inequalities more apparent between 2010 and 2022. Policy action and greater protections for gender diverse Australians are urgently needed.

Ind-1072 Health-related Quality of Life, Service Utilisation and Costs for Anxiety Disorders in Children and Young People: Systematic Review and Meta-analysis

PRESENTER: **Sithara Wanni Arachchige Dona**, Deakin University, Institute of Health Transformation, Deakin Health Economics
AUTHORS: Ha N.D Le, Ms. Lisa Gold, Anh Ho, Kaitlyn Mckenna, Shalika Bohingamu Mudiyanselage, Monique Seymour

Background: Anxiety disorders are common mental health issues in children and young people (CYP) and place a significant health, societal and economic burden on CYP, their families and society. The literature on the overall economic burden relating to health-related quality of life (HRQoL), service use, and costs is limited for anxiety disorders among CYP and caregivers. This study synthesises the literature on how anxiety disorders are associated with these outcomes in CYP (0-24 years) and caregivers.

Method: This systematic review was conducted following the PRISMA 2020 and the protocol was registered in PROSPERO. A systematic search was undertaken across six databases between January, 2013 (based on the release year of the Diagnostic and Statistical Manual of Mental Disorders-fifth version) and February 2024: MEDLINE, PsycINFO, CINAHL, EconLit, Global Health and Embase. Grey literature was searched on Advanced Google and Trove database. Four reviewers independently conducted the title and abstract screening, full-text screening and quality assessment. Any discrepancies were resolved upon discussion among the review team. An adapted version of the Effective Public Health Practice Project tool was utilised to assess the quality of the included studies. Narrative synthesis was provided, and meta-analysis was conducted for studies reporting the same outcome measures for social anxiety and comorbid anxiety.

Results: A total of 38,616 studies were identified, with 24 studies included in the review: thirteen studies (54%) exclusively reported HRQoL in

CYP with anxiety disorders (seven on anxiety as the primary condition, and six on comorbid anxiety); one (4%) exclusively looked at caregivers' HRQoL; five (21%) studies on service use; and one (4%) study on cost. one (4%) looked at both caregivers and CYP's HRQoL; one (4%) study on service use and CYP's HRQoL; two (8%) studies on both service use and costs. Most studies were cross-sectional (n=19), with only four being longitudinal studies. The follow-up period for four longitudinal studies varied: 1.5, 2 and 6 years for HRQoL, and 4 years for service use. Studies found poorer HRQoL in CYP with anxiety disorders compared to those without anxiety or healthy controls. Meta-analysis found a medium pooled effect size for social anxiety on psychosocial (Hedges' g = -0.74, 95% CI -3.62, 2.14) and social relations (Hedges' g = -0.57, 95% CI -0.75, -0.39) domains of HRQoL. Comorbid anxiety in those with other health conditions was also associated with poorer HRQoL than those without comorbid anxiety, with a large pooled effect size (Hedges' g = -1.07, 95% CI -1.34, -0.79) for overall HRQoL and emotional functioning (Hedges' g = -1.37, 95% CI -1.65, -1.09). While there is limited research, available studies show that childhood anxiety disorders were also associated with increased health service use and costs along with reduced caregivers' HRQoL.

Conclusion: Findings show that anxiety disorders in CYP were associated with lower HRQoL for both them and their caregivers, increased health service use and costs. This review highlights the need for future research to examine the burden on caregivers and long-term impact on CYP's in terms of HRQoL, service use and costs.

Ind-1338 Dose-Response Relationship Between Homophobic Discrimination and Mental-Health

PRESENTER: **Vincent Leo Leroy, PhD student**, Aix-Marseille University
AUTHORS: Luis Sagaon Teyssier, Bruno Spire, Annie Velter, Maxime Luiggi

Background: Experienced homophobia has been identified as a negative correlate of health outcomes for sexual and gender minorities, especially mental health among gay men, bisexual men and other men having sex with men (GBMSM). Existing literature often uses binary measures which result in a waste of information in the study of the link between homophobic-related discrimination and mental health. This relationship cannot be studied without accounting for the cumulative effect of multiple homophobic experiences and the different social environments where they occur. The present study aims to estimate the dose-response effect of homophobia experienced by French GBMSM over mental health indicators such as anxiety, psychological distress, suicidal ideations and suicide attempts. Methods: We used data from Rapport au sexe survey (ERAS) conducted among GBMSM in France over four repeated cross-sectional waves between 2017 and 2023. A measure of cumulative homophobic experience was constructed, including verbal and physical abuse in multiple social environments such as the workplace, educational institutions, public spaces, neighborhoods, and family. We studied mental-health using four distinct outcomes: 1) Anxiety (GAD-7); 2) Psychological distress (K-5); 3) Suicidal ideations; 4) Suicide attempts. We controlled with well-established socioeconomic and health variables at individual level. We controlled the spatial heterogeneity in France (at the county-level) using the following measures: a homophobic hate crime index, a political index and an index of living standards. A logistic multilevel mixed-effects model was used to estimate, separately, the dose-response effect of homophobia over the 4 outcomes. We computed marginal effects to assess the impact of cumulative homophobic experiences on predicted probabilities (PP) of moderate/severe anxiety, psychological distress, suicidal ideations and suicide attempts. Results: Final sample comprised 81,263 participants. Our results highlight strong evidence of a dose-response relationship between cumulative homophobic experiences and each health outcome across different time periods (2017/2019 - 2021/2023). The more GBMSM experience multiple homophobic prejudices within different environment, the more their odds to be at risk of moderate/severe anxiety (aOR = 1.8 to 7.1, p-value<0.001), psychological distress (aOR = 1.5 to 6.4, p-value<0.001), suicidal ideations (aOR = 1.6 to 4.8, p-value<0.001) and suicide attempts (aOR = 1.5 to 12.5, p-value<0.001) increase. GBMSM who were confronted to five or six homophobic contexts within the past 12 months were at a significantly elevated risk for moderate/severe anxiety (PP = 62%), psychological distress (PP=73%), suicidal ideation (PP = 40%) and for suicide attempts (PP = 10%) during the year preceding the surveys. Conclusion: The mental-health of GBMSM who experience cumulative homophobic prejudices within different social environments tend to be severely compromised. Despite recent improvement in terms of social and legal recognition in most western countries in terms of inclusion of LGBTI communities, homophobia remains a significantly prevalent and harmful phenomenon in France. This highlights the need for: i) the implementation of LGBT+ support centers that include psychological support across the entire country, especially where the frequency of discrimination is high; ii) the development of public policies that aim to end homophobia and defend LGBTI populations rights.

Ind-2030 Psychosocial Stressors and Resilience Patterns in a Sample of Low-Income South Africans

PRESENTER: **Patrizio Piraino**
AUTHORS: Catherine Maloney, Sylvia Blom, Safa Rahman, Laura Miller-Graff

Introduction: South Africans face exposure to direct and structural violence, which have been consistently associated with psychological distress. To understand how resilience influences this relationship, the current study examines the association of multidimensional resilience and violence exposure with psychopathology using a sample of low-income South African adults. **Methods:** Participants (N=404) completed measures on neighborhood crime (i.e., direct violence), stress about neighborhood characteristics (i.e., structural violence), the Patient Health Questionnaire-8, General Anxiety Disorder-7, and Adult Resilience Measure-Revised (scored as 3-factors – personal, family, friends/contextual assets). A subsample of participants (n=251) also responded to a free-response item asking about the primary way they cope with stress. **Results:** A multiple regression model showed greater exposure to direct violence was associated with higher depression (β=.19, p<.001) and anxiety (β=.28, p<.001), while higher personal (β=-.10, p=.036) and family (β=-.12, p=.0004) assets were associated with lower depression. A moderation model, coupled with sensitivity analyses, showed that higher personal assets protected against the impact of direct violence on depression (β=-.30, p<.001) and anxiety (β=-.21, p=.015). Additionally, qualitative data revealed four coping categories: Adaptive-Cognitive; Adaptive-Relational; Adaptive-Behavioral; and Maladaptive. **Conclusions:** The empirical analysis suggests that exposure to diverse forms of violence serves as a significant stressor, but personal and relational assets may be particularly promotive of mental health. These findings underscore the importance of implementing community initiatives to address environmental stressors and of designing targeted interventions that bolster resilience in peri-urban South Africa, ultimately promoting overall well-being.

abs-os55 ADHD and Educational Outcomes: Results from an Australian Longitudinal Population-Based Study

PRESENTER: **Ha Thu Bui**
AUTHORS: Ms. Lisa Gold, Ha N.D Le, Monique Seymour

Background: Attention Deficit Hyperactivity Disorder (ADHD) is one of the most prevalent neurodevelopmental conditions in children. The current literature has linked childhood ADHD with poorer academic outcomes during primary school; however, evidence on long-term outcomes of childhood ADHD until late adolescence and adulthood is still limited. **Objective:** This study investigated the association between childhood ADHD and long-term academic performance in a large community cohort of Australian children. **Methods:** Data was from the Longitudinal Study of Australian Children (LSAC; wave 1-9C2; N=4983 for Kindergarten cohort; N=5107 for Birth cohort) which was linked to national education data (NAPLAN scores at Years 3, 5, 7 and 9; tertiary study outcomes). Educational outcomes (highest level of education and qualification) were compared between young adults with and without ADHD in wave 9C2 (ages 17-22). The impacts of childhood ADHD on educational outcomes were estimated using a mixed effects model allowing random effects for study child and suburb. NAPLAN scores were assumed to be a function of childhood ADHD condition and other covariates, including child characteristics (sex, indigenous status, language other than English at home, age, age squared, level of remoteness, the Strength and Difficulty Questionnaire (SDQ) prosociality scale, SDQ peer problems scale, externalising problems), family characteristics (socioeconomic position, number of siblings, number of parents in the home, global parenting self-efficacy rating), school characteristics (school type) and NAPLAN year (3,5,7,9). All data was weighted using LSAC longitudinal weight. The primary analysis was based on parent-reported ADHD; analysis using ADHD symptoms identified by the SDQ screening tool was also conducted for robustness check. **Results:** - Overall, young people with ADHD had lower levels of education and qualification at ages 17-22. - The proportion of young people who had completed year 12 or equivalent was significantly lower for those with ADHD (50%) than those who do not have ADHD (59%). - Among those that were currently enrolled in study, a higher proportion of young people with ADHD attended Technical or Further Educational Institution (30%) than those without ADHD (11%), whereas a higher proportion of young people without ADHD attended University or other Tertiary Institutions (38%) than those with ADHD (17%). - The mixed model estimation showed that childhood ADHD was associated with significantly reduced NAPLAN scores in all scales: writing scores by 43.2 points and grammar, numeracy, reading and spelling scores by 37.0, 33.9, 33.3, 38.9 points, respectively. **Conclusion:** The results of this study provide evidence on the adverse associations of childhood ADHD and long-term educational outcomes in late adolescence and early adulthood. The findings highlight a need for teachers, clinicians and policymakers to explore relevant effective interventions and for policy to support children and young people with ADHD at school to improve academic outcomes.

1:30 PM –3:00 PM MONDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Bougainville

Pharmaceutical R&D and Pharmaceutical Shortages

MODERATOR: **Yoko Ibuka**,

Ind-745 Factors Associated with Pharmaceutical Shortages in the UK

PRESENTER: **Ana Correa Ossa**
AUTHORS: Rodolfo Catena, Kiara Govender, Ahmed Elnady, Priyanka Thakur, Havovi Khareghat, Fausto Catena, Vanni Agnoletti

Background and research aim In 2023, shortages of medicines in the UK, Europe, and the United States reached historical peaks (McCarey et al., 2022; Johnston & Borrett, 2024). Hospitals across the world are struggling to maintain consistent medical supplies and are holding weekly emergency meetings to address ongoing shortage of pharmaceuticals (McPhillips, 2023; Miljković et al., 2024). A recent UK government report concluded that more research needs to be undertaken to understand causes of medicines shortages in the UK and globally (Duddy, 2024). The characteristics of the drugs themselves, such as the price, ingredients, manufacturer, and health condition treated, may be associated with the likelihood of shortages. Low medicine prices may make certain pharmaceuticals economically unviable for manufacturers (Duddy, 2024), while lack of alternatives could lead to a reduction in the supply to incentivise price concessions. Additionally, pressures such as increased demand of certain ingredients, or rise in the prevalence of specific health conditions, may work together to reduce the availability of a drug. **Methods** Using data from the MIMS Shortage Tracker and the Business Service Authority Prescriptions Cost Analysis (2020-2024), we explore the potential characteristics that could lead to shortages. We use a logistic regression model where the outcome variable is the probability of a drug being unavailable. Explanatory variables include price, manufacturer, health condition, and year. We validate our findings with qualitative evidence from a workshop with healthcare professionals, pharmaceutical industry representatives, and policy makers in the EU. **Results** Lower prices are associated with a higher probability of a drug being in shortage, even adjusting for manufacturer, condition, and year. Qualitative findings point to a number of systemic causes of shortages: limited diversification of manufacturers, fragmented procurement processes and prioritising price over reliability, and a lack of timely data on prescribing trends or inventories. Regulatory rigidity, including limited options for substitution or stock sharing, further constrains responsiveness.**Discussion** While our UK data shows that low price is a significant predictor of shortages, our findings from the stakeholder workshop in the EU suggest that it is part of a broader set of systemic issues such as lack of resilience in procurement systems, insufficient local capacity, and poor coordination across the supply chain. Future solutions include reforming procurement criteria to reward reliability, introducing flexibility in licensing and substitution rules, and strengthening communication between stakeholders. Expanding local manufacturing capacity, developing stock buffers for critical medicines, and improving public trust to avoid panic stockpiling were also recommended. The EU's recent policy efforts with the Critical Medicines Act, point to a shift towards strategic governance, but implementation gaps remain. Future research should explore additional predictors of shortages, including discrepancies between tariff and reimbursement prices; regional differences in procurement practices; and the role of rapid shifts in prescribing (e.g. semaglutide). A priority is the development and evaluation of real-time data-sharing platforms for tracking medicine stocks across the supply chain, balancing transparency with security concerns.

Ind-984 The Impact of Drug Shortages on Patients' Financial Costs: Evidence from Japan

PRESENTER: **Yoko Ibuka**, Keio University
AUTHOR: Haruo Kakehi

Background. Drug shortages are a global issue, but research on their impact is limited due to challenge of identifying when and whom they affect. In Japan, a primary cause of drug shortages is government-imposed suspension of production resulting from misconduct among generic prescription drug manufacturers, leading to reduced availability of generic prescription drugs. Since generic drugs provide equivalent efficacy at lower costs compared to brand-name drugs, their unavailability forces patients to resort to more expensive alternatives. This raises concerns about increased financial burdens, particularly for patients with chronic diseases who rely on regular and stable medication.

Aim. This study examined how shortages of generic prescription drugs, resulting from manufacturers' misconduct and subsequent government-mandated production suspensions, impacted patients' financial burdens among patients prescribed medication for three chronic conditions.

Methods. To clarify when each shortage begins to impact individual patients, we linked patient-level drug claims data with production suspension dates of two major generic drug manufacturers. To examine the impact of manufacturing suspensions on patient drug costs, we employed the difference-in-differences (DID) estimation using data between January 2020 and December 2023. We focused on three drug categories: hypertension, dyslipidemia, and psychotropic medications, each comprising both brand-name and generic drugs. We assessed how the out-of-pocket costs for patients using generic drugs from the suspended manufacturers had changed by these suspensions. In the DID estimation, we compared patients who heavily relied on drugs from the suspended manufacturers before the suspension with those who used alternative drugs within the same drug category.

Results. The proportion of prescriptions discontinued due to the suspensions was 8.4%, 10.9%, and 10.1% for hypertension, dyslipidemia, and psychotropic drugs, respectively. Out-of-pocket expenses increased across all three drug groups; for example, for psychotropic drugs, patients' out-of-pocket expenses increased by 1.4% to 9.9%, depending on the suspensions and model specifications. This increase was accompanied by a 1 to 3 percentage point decrease in the share of generic drugs, suggesting that the higher costs were partially driven by the substitution of affordable generics with more expensive brand-name alternatives.

Conclusions. Drug shortages could increase patients' financial costs and potentially place a greater fiscal burden on public health insurance. The financial impact of drug shortages should be acknowledged and addressed as part of the broader issues associated with drug shortages.

Ind-1102 The Impact of National Volume-based Procurement Policy on The Pharmaceutical Industry in China: A Mixed Methods Study

PRESENTER: **Yan Song**

Objective: Since 2019, the Chinese central government has taken significant steps to centralize national purchasing power and has implemented a pooled procurement system. The primary objectives of the national volume-based procurement(NVBP) were to reduce drug prices, improve access to affordable medications, and enhance the overall functioning of the China’s pharmaceutical industry. While most research focused on the achievement of the policy goal of improving the accessibility and affordability of common drugs, few studies have investigated its influence on the operational performance of pharmaceutical firms. The objective of this study was to explore the impact of the NVBP policy on China’s pharmaceutical industry. **Methods:** A mixed methods study was conducted. The quantitative phase involved an empirical analysis designed to assess changes in business performance before and after policy implementation among publicly listed pharmaceutical manufacturing companies from 2019 to 2023. The qualitative phase included interviews with key stakeholders such as senior manager from pharmaceutical firms in order to gain insights into their perceptions of the NVBP policy. **Results:** The NVBP policy significantly reduced operating profit margins($p<0.01$), although it enhanced short-term total assets and operating revenue. The policy also stimulated substantial growth in R&D expenditures($p<0.01$). Interview results revealed that most enterprises perceived intensified price competition dut ot NVBP, resulting in reduced profits. As countermeasures, these enterprises have adopted various strategies including strengthening marketing activities, increasing R&D investment, and reducing production costs. **Conclusion:** The NVBP policy had a negative impact on the operational performance of China’s pharmaceutical industry in the short term. However, the observed increase in R&D investment suggests the potential for positive long-term outcomes. This heightened focus on innovation may contribute to improving the overall industry ecosystem.

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Ind-457 Bridging Gaps in Medical Innovation: from Development to Market Access and Reimbursement in Thailand

PRESENTER: **Mr. Puwadol Chawengkul**
AUTHORS: Siriyada Kitbamrung, Yot Teerawattananon, Chee Ern Har, Yi Wang, Teerawat Wiwatpanit

Background:

The Thai Innovation List, established in 2015, is an initiative to promote local innovations by incentivizing innovators to develop high-value products through public procurement. This initiative primarily benefits medical innovations, as the majority of registered products under the Thai Innovation List are medical products. However, these medical products still struggle to gain market traction and healthcare system adoption. Despite regulations and incentives, demand for medical products from the Innovation List remains low. Similar initiatives, such as South Korea’s Public Procurement Service, the United Kingdom’s Public-Private-Partnership Compact, and Singapore's Regulatory Sandbox, aim to promote public procurement of high-potential medical innovations, but neither these initiatives nor the Thai Innovation List cover the full value chain of innovation development—from ideation to commercialization and implementation. As medical innovation development

requires extensive support from all stakeholders in the innovation ecosystem, including innovators, funders, and policymakers, understanding the current landscape of medical innovation is necessary to identify factors that contribute to successful development and implementation in the healthcare market.

Objective:

This study aims to map the medical innovation landscape in Thailand to identify key factors for developing high-potential and high-demand medical innovations and products and develop policy recommendations to promote an efficient medical innovation ecosystem in Thailand.

Methods:

The study analyzed 393 medical products registered under the Thai Innovation List as of August 30, 2024. Data on product characteristics and intellectual property rights were collected from public databases and interviews. Descriptive statistics examined relationships among product characteristics, research and development processes, collaborations, intellectual property, commercialization, and funding sources. Stakeholder input was incorporated to enhance and validate findings.

Results:

Pharmaceutical products account for the majority of registered innovations (n=309), followed by medical consumables (n=34) and devices (n=30). The registered innovations were developed by the private sector using their own funding and without external collaborators or technology transfer. However, there was slightly more involvement of the public sector in the development of medical consumables and devices (MDs). Interestingly, MDs had a higher proportion of patents and petty patents (27%) compared to pharmaceutical products (4%), which were mainly follow-up medicines with only trademarks (67%), indicating the stronger innovativeness of local MDs. In contrast, over 52% of registered pharmaceuticals were already included in public health benefit schemes, while only 27% of MDs were covered by public insurance programs. According to stakeholder consultation, this result aligns with the fact that most medical product manufacturers and developers are small and medium enterprises that cannot absorb the high costs of starting materials and scaling up production of MDs, leading to the delegation of innovation costs to patients and payers and reducing their feasibility for public reimbursement schemes.

Conclusion:

The complexity of the healthcare sector, with its many stakeholders and agendas, can lead to a misalignment between health innovation development, market access, and healthcare coverage policies.

To address these challenges and promote efficient medical innovation development and implementation, there is a need to reform the health innovation ecosystem to bridge the disconnection between innovation development and the public reimbursement of the innovation.

Ind-1021 Identification of Factors Associated With High-Value Health Innovations in Thailand

PRESENTER: **Chee Ern Har**
AUTHORS: Mr. Puwadol Chawengkul, Siriyada Kitbamrung, Narisa Mantharngkul, Yot Teerawattananon, Teerawat Wiwatpanit, Yi Wang

Background and Objective

Health innovation is essential to address rising healthcare demand and control costs, but moving from research to commercialisation remains challenging. The Profiting from Innovation (PFI) framework suggests that success depends not only on technological innovation but also on appropriability mechanisms, complementary assets, and alignment with dominant designs. In Thailand, the Innovation List leverages public procurement to promote local innovations, yet empirical evidence on what drives their success remains limited. This study aims to identify factors associated with reimbursement and market success of medical products on the Thai Innovation List.

Methods

Medical products listed as of 30 August 2024 were analysed. Data were sourced from public databases and registrant questionnaires and classified according to the PFI framework. Logistic and quasi-binomial regression models assessed associations with reimbursement by public health insurance schemes and proxy market share. Findings were validated through stakeholder consultations.

Results

Reimbursement analysis included 383 products using public data and 142 with questionnaire inputs, with 109 products analysed for market share. Product classification, disease focus, and intended use, and public sector involvement were important mediators of reimbursement and market success. Technology transfer supported reimbursement, while external funding and research collaboration showed negative associations. Clinical trials and reimbursement status strongly predicted market performance, highlighting the importance of complementary assets.

Conclusion

In Thailand, innovation success is shaped more by alignment with health system priorities and access to complementary assets than by appropriability mechanisms. Policy reforms should enhance reimbursement processes, strengthen translational partnerships, and expand support for emerging technologies.

Bali International Convention Centre – Dahlia

Climatic Events and Natural Disasters

MODERATOR: **David Johnston**,

Ind-47 Disaster Exposure and Informal Caregiving Burdens: Lessons from the Great East Japan Earthquake

PRESENTER: **Takumi Toyono**
AUTHOR: Haruko Noguchi

Background

Natural disasters significantly disrupt economies and societies, often with pronounced adverse effect on health outcomes, particularly among older adults. However, the impact of disasters on informal caregivers who assist these vulnerable individuals remains insufficiently explored. Existing research primarily employs qualitative methods such as interviews, which may limit internal validity. Additionally, prior studies often fail to differentiate between individuals who were already providing informal care before a disaster and those who assumed caregiving responsibilities afterword. This distinction is critical, as both heightened disaster risks and rapid population aging are likely to increase the number of individuals taking on caregiving roles post-disaster. To fill these gaps, this study quantitatively examines how natural disaster exposure influences informal caregiving burdens, focusing on caregiving provision and caregivers' health outcomes while accounting for this caregiver classification.

Methods

We employ a difference-in-differences approach, leveraging regional variations in exposure to the Great East Japan Earthquake – the fourth largest earthquake in the world – which heavily impacted regions with aging populations. Our analysis integrates multiple nationally representative administrative datasets from Japan, including the Longitudinal Survey of Middled-aged and Elderly Persons, conducted by the Ministry of Health, Labour and Welfare. This survey tracks 34,240 individuals aged 50-59 nationwide in the baseline wave in the year of 2005. We utilize data spanning from 2008 to 2017 and classify caregivers into two categories: actual caregivers (those already providing care before the disaster) and potential caregivers (those with the potential to take on caregiving roles).

Results

Our findings indicate a rise in informal caregiving in disaster-affected regions for both actual and potential caregivers. Specifically, caregiving time increased by 8.5 hours per week at the intensive margin, while the probability of providing informal care rose by 2.3% points at the extensive margin. Mental health deteriorated exclusively among potential caregivers, whereas self-rated health and physical health remained unchanged. These effects were particularly pronounced among female or less-educated caregivers. Two mechanisms likely contributed to these outcomes: a decline in labor force participation among potential caregivers, increasing their caregiving involvement, and reduced availability of formal at-home care, such as home help service, which are often substitutes for informal care.

Discussion and Conclusion

Our findings suggest that the societal costs of natural disasters may be underestimated, as informal caregivers – not just older adults – are significantly affected. Potential caregivers, in particular, bear new caregiving responsibilities following disaster exposure, alongside the existing burdens on actual caregivers. This study offers two key policy implications. First, expanding resources for formal at-home care services is crucial to alleviate the spillover effects on informal caregivers, especially potential caregivers. Second, targeted interventions, such as training programs for disaster preparedness, are essential to support vulnerable caregiver groups, including women and less-educated individuals.

Ind-1650 Health Under Crisis: The Effects of Economic Unexpected Crisis on Newborn's Health

PRESENTER: **Dr. Bernard Moscoso, PhD**, ESPOL - Escuela Superior Politécnica del Litoral

Economic crisis has been documented to damage fetus health conditions including birthweight, preterm incidence and cognitive capacity. The existing literature has explained this cause through two mechanisms such as maternal stress and malnutrition, depending on the nature of the crisis and its duration. However, it is unclear how these mechanisms interact under two different and unexpected economic shocks. The objective of this paper is to examine the effects of economic crisis on newborns' health in Ecuador. For this, we exploit the 2016 earthquake and the COVID-19 pandemic in 2020. The 7.8 magnitude earthquake that struck Ecuador on April 16, 2016, causing significant damage in the north-west region, generating 3 billion dollars losses (3% of the GDP). Meanwhile, the economic impact of the pandemic between March and May 2020 represented an estimated economic contraction of 6.4 billion dollars (6% of the GDP). These exogenous events provide an opportunity to study the effects of these crises on neonatal health and allows to disentangle the mechanisms of impact. We gather and combine data from small and medium-sized enterprises' invoices from the Ecuadorian Internal Revenue Service, and the adjusted per capita invoices using population data. This invoicing, which reflects better the economic activity variable for households, was seasonally adjusted using the X-13ARIMA-SEATS method with the SEASONAL package in R, and subsequently decomposed into trend and cycle components applying the Hodrick-Prescott filter ($\lambda = 14400$), suitable for monthly series. The extracted economic cycle was used as an independent variable to identify periods of economic contraction in each city. The analysis integrated data from the Live Birth Registry, which includes detailed information by city and month of gestation. By linking these databases, the corresponding economic cycle was assigned to each gestational trimester of each newborn. To estimate this effect, we follow a DID design with newborns' health at birth such as birthweight, gestation weeks, and apgar score,

probability of low-birthweight, and preterm birth, as the outcome variables. The main regressors are two indicators capturing the exposure to economic shocks, and exposure during gestation trimester. We include child and mother characteristics such as single birth, sex, mother's age, education, prenatal controls, ethnicity, place of birth, number of children, among others. The estimation includes city and month of the year fixed effects. We assume the error term to be iid, and we cluster the standard errors at the city level. The preliminary findings reveal that the exposure to the 2016 earthquake during the first trimester of gestation causes a birthweight deficit of 180 grams and reduces the gestation length in 2 to 3 weeks. In the case of the COVID-19 crisis, exposure during first and third trimester of gestation caused birthweight deficit of 280 to 350 grams. These results contribute to the literature on how different economic crises affect neonatal health through different mechanisms and underscore the relevance of considering these impacts in the design of public health and economic policies to safeguard health conditions.

1:30 PM –3:00 PM MONDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Executive Room 1

Measuring Multidimensional Wellbeing across the lifespan

MODERATOR: **Stephanie Schurer**,

Ind-1588 Psychometric Insights into the EQ-5D-5L and EQ-HWB in a Sample of Older Australians

PRESENTER: **Akanksha Akanksha**

AUTHORS: Deborah Street, Rosalie Viney, Brendan Mulhern

BACKGROUND The demand for care services for older adults is expected to rise in the coming years because of rapidly ageing population. Simultaneously, care providers are facing challenges from reforms, budget constraints, and escalating government regulations. Consequently, the significance of accountability in care services grows, emphasizing the necessity to demonstrate the value of these services. One way to determine this value is by evaluating important outcomes like quality of life (QoL) for older adults. QoL is a commonly used metric in the evaluation of multisector public policy, including health, social, community and environmental policy actions. Several QoL instruments are available for use, including those in the EuroQol suite (EQ-5D-5L and EQ-HWB). The aim of this study is to understand the psychometric properties of the EQ-5D- 5L and EQ-HWB in a sample of older Australians in comparison to other key instruments that are widely used in the field (including the Quality of Life- Aged Care Consumer (QOL-ACC) which is an aged care sector specific instrument, and Adult Social Care Outcomes Toolkit (ASCOT) that measures social care related QoL).

METHODS Dataset was derived from a 2023 online survey in Australia that collected self-reported health conditions, and QoL data. A subset sample of 453 older Australians aged 65+ who completed the EQ-5D-5L, EQ-HWB, QOL-ACC and ASCOT questionnaires were included in the analysis. Response distributions, including floor and ceiling effects, and utility values were examined. Convergent validity was assessed using Spearman's correlation at both the item and value set level. Known group validity was examined by comparing known groups (presence of chronic conidiations, VAS score ≤80) using one-way ANOVA and Cohen's D for effect size (ES). Test-retest reliability was assessed for respondent who did not indicate any change in their health, social support status or QoL in general (n=201) using the intraclass correlation coefficient (ICC).

RESULTS Mean utility values for EQ-5D-5L, EQ-HWB, ASCOT and QOL-ACC were 0.88, 0.82, 0.88, and

0.81 respectively. The best health state as described by ASCOT had zero respondents, EQ-HWB had 40 (8.8%) respondents, QOL-ACC had 64 (14.1%) respondents, and some indication of a ceiling effect was observed with EQ-5D-5L where 83 (18.3%) respondents reported being in the best health state described by the instrument. The highest correlation was between EQ-5D-5L and EQ-HWB utility values (ρ=0.72). At the dimension level, the highest correlation was between the pain and anxiety/depression items of EQ-5D-5L and EQ-HWB (ρ=0.72 to 0.77). Statistically significant differences in mean scores were observed among known groups, with effect sizes in the moderate to large range across all four instruments. ICC for EQ-5D-5L, EQ-HWB and ASCOT was 0.60 (CI 0.50;0.68), 0.65 (CI 0.57; 0.73), and 0.45 (CI 0.34; 0.56) respectively indicating moderate to poor reliability.

CONCLUSION The findings offer insights into how EuroQol instruments perform among elderly individuals, a focal point outlined in the strategic plan. The contrast between EQ-5D-5L and EQ-HWB indicates that these instruments offer distinct advantages when gauging the QoL in older demographics. Expanding the sample size would enhance the psychometric comparison of these instruments

Ind-719 The Value of Neighborhood Greenspace for Children Using the Life Satisfaction Approach

PRESENTER: **Ellen Hannes**

AUTHORS: Stephan Bruns, Michelle Plusquin, Robert Malina

Across the globe, urbanization is increasing, intensifying the pressure on greenspaces, which affects all its users, including children. This is potentially concerning since exposure to nature enhances children's health and well-being. With regard to well-being, while robust evidence is present on the positive relationship between exposure to nature and well-being of children, currently no monetary valuation of the well-being benefits exists, making them more difficult to appropriately include in public decision-making regarding greenspace development. This study, for the first time, puts a monetary value on neighborhood greenspace exposure for children using the life satisfaction approach (LSA). This approach has been employed for the monetary valuation of environmental goods and issues but has not been extended yet to value the well-being of children. The LSA quantifies the influence of neighborhood greenspace on children's life satisfaction (LS) and compares it to the impact of other determinants of their LS that can be valued in monetary terms. In that way, the LSA calculates the amount of money to offset a

change in neighborhood greenspace to keep the child at the same level of LS. As a result, the LSA does not require children or their parents to assign monetary values themselves. Data were gathered from 475 parent-child pairs in 29 different primary schools in Flanders (age range of children 10-12). The monetary value will be determined based on the tradeoff between the impact of the exposure of neighborhood greenspace on children's LS and the impact of household income on children's LS. The results of the study reveal the monetary value of neighborhood greenspace in terms of improvements in children's self-reported LS. Preliminary results show that there is a positive association between greenspace in a 100m buffer around children's home address and children's LS, as well as a positive association between household income and their LS. Moreover, the willingness to pay for greenspace diminishes when greenspace is located at greater distances or when a substantial amount of greenspace is already available.

Ind-1557 Exploring Health Spillover Effects Within The Context of Dementia Using EQ-HWB

PRESENTER: **Valeriia Sokolova**
AUTHORS: Jan Faller, Thao Thai, Lidia Engel

Abstract

Objectives

Providing care for a person with dementia can impose a significant burden on family members and other informal caregivers. While the costs of caregiving are sometimes included in economic evaluations, the benefits and disutility to informal caregivers, referred to as "health spillovers", are usually omitted. The objective of this study is to estimate the relative health spillover effects of dementia caregiving on informal caregivers from Australia using the short form of the EQ Health and Wellbeing (EQ-HWB-S) questionnaire.

Methods

A cross-sectional survey was conducted involving informal caregivers of people with dementia residing in Australia. Informal caregivers completed the EQ-HWB (25-item) and proxy reported the health-related quality-of-life (HRQoL) of the person with dementia using the EQ-HWB-S (9-item). To estimate the relative spillover, multiple linear regression was used to model caregiver's HRQoL, using the EQ-HWB-S, as a function of the person with dementia HRQoL (based on the EQ-HWB-S), adjusting for their individual and demographic characteristics.

Results

In total, 202 informal caregivers completed the survey. The average age of caregivers was 60.4 (SD = 13.7), with 63.2% being female. The univariate analysis revealed a positive relative spillover effect coefficient of 0.23 (p<0.001, R-squared=0.10), demonstrating a significant positive association between caregiver's and person's with dementia HRQoL using the EQ-HWB-S. This relationship remained significant when adjusting for other characteristics in the multivariate regression model (p<0.001, adj R-squared=0.30). Multivariate regression model showed that informal caregivers living together with the person with dementia had substantially decreased HRQoL estimated with EQ-HWB-s compared to informal caregivers of people with dementia who lived alone or in a care home (p=0.03). Caregivers with present chronic conditions had statistically significantly reduced EQ-HWB-S estimates (p<0.001). Age and gender of the person with dementia did not have a substantial impact on the caregiver's EQ-HWB-S estimates. However, age of caregivers impacted their HRQoL estimates (p=0.03).

Conclusion

Providing informal care for a person with dementia is associated with substantial health spillovers. It is essential to include health effects on informal caregivers into economic evaluations to account for the burden of dementia posed beyond the affected individual.

Ind-2244 Wellbeing in Latin America: Who Are the Most Vulnerable in Argentina, Chile, Ecuador and Peru?

PRESENTER: **María-José Mendoza-Jiménez**, Erasmus University Rotterdam
AUTHOR: Job van Exel

Background and aim: Low wellbeing today is linked to poorer health outcomes in the future. Increasingly, wellbeing is recognized as the key outcome for policies not only in healthcare, but also in sectors like education, environmental management, and criminal justice. For wellbeing measures to be effective in policy design, evaluation and monitoring, analysts must use measures that have been validated within the specific context where they are applied. However, the majority of wellbeing measures have been developed and validated in higher-income settings, limiting their relevance elsewhere. The 10-item Wellbeing Instrument (WiX) is a recently introduced tool designed to capture all relevant benefits of healthcare and other policy interventions. The Spanish version of the WiX is the first validated multidimensional wellbeing measure for the general adult population in the Latin American context. This study aims to apply the WiX to identify and characterize low wellbeing groups in Argentina, Chile, Ecuador, and Peru. Methods: Data from an online survey, representative of the adult population in terms of age and gender, was collected in these four countries. Subjective wellbeing was measured using the validated Spanish version of the WiX, with aggregate scores ranging from 10 to 50. Low wellbeing was defined as WiX scores at or below the 25th percentile of country-specific distributions for overall wellbeing, and reporting being (very) dissatisfied on a WiX item for dimensions of wellbeing. We employed multivariate logistic regressions to examine factors predicting low overall wellbeing and dissatisfaction across the ten dimensions of wellbeing included in the WiX. Associations were adjusted for socio-demographics, health status, and perceptions of safety in daily life and political situation. Results: A total of 2,301 respondents participated across the four countries: Argentina (N=718), Chile (N=557), Ecuador (N=500), and Peru (N=526). Women, younger age groups (18-35 years), household financial struggle, and poor health status were consistently associated with low overall wellbeing across all countries. Additional factors associated with low overall wellbeing included feeling discriminated against (Argentina and Ecuador), urban residence (Chile and Ecuador), female gender (Argentina), irreligiosity (Chile), feeling unsafe in daily life (Chile), and negative perceptions of the political situation (Peru). Lower health status predicted low wellbeing across all ten dimensions in all countries. Financial struggle predicted dissatisfaction with own financial situation and activities in all countries. An example of country- and dimension-specific insights is that, in Argentina, low overall wellbeing among females was associated with dissatisfaction in the dimensions

physical health, safety, relaxation, leisure time, activities, and self-worth. Conclusion: This study highlights three common determinants of wellbeing vulnerability—younger age, financial struggle, and health status—across the studied countries. While younger age and financial struggle predict dissatisfaction in various dimensions of wellbeing, poor health status predicts dissatisfaction across (almost) all dimensions. Moreover, characteristics of vulnerable groups differ between countries, which underscores the value of the WiX in guiding priority-setting and design in policy sectors aiming to maximize wellbeing.

Ind-2859 A Study to Estimate the Value Set for Recovering Quality of Life - Utility Index for Hong Kong General Population

PRESENTER: **Richard Xu**

Background The Recovering Quality of Life (ReQoL) instrument was developed to assess health-related quality of life for adults experiencing a wide range of mental health difficulties—from common issues to severe psychotic disorders. Recently, concerns have arisen about using generic preference-based measures (PBM) to evaluate health benefits in mental health. In response, the ReQoL-UI with seven dimensions, derived from the ReQoL, was created to support economic evaluation and resource allocation in mental health-related interventions. However, the preference weights of the ReQoL-UI have not yet been reported in Asian populations. **Objectives** This study aimed to estimate the preference weights of the ReQoL-UI in Hong Kong general population, to better capture the benefits of mental healthcare. **Methods** A discrete choice experiment (DCE) with a duration item (1, 5, 10,15 years) was used to estimate the preference weights of the ReQoL-UI. The D-optimality criterion determined the experimental design. The severity levels for each of the seven dimensions were treated as categorical, while the duration dimension was treated as a continuous variable. In this study, a pool of 180 choice-sets was determined to ensure satisfactory coverage and feasibility. Each respondent was randomly allocated 12 of the 180 choice-sets in the survey. All participants were recruited from the online panel of a survey company in Hong Kong. A sample of 100 participants was invited to complete a pilot survey to confirm its feasibility and logic. A formal survey using quota sampling based on sex and age was then conducted to estimate preference weights. The DCE data was analyzed using a conditional logit model. **Results** A total of 1,008 individuals completed the survey, which fully matched the distribution of the normal population based on sex and age according to Hong Kong's 2021 statistical census. The R-squared value of 0.154 for the DCE with duration data suggests high-quality data. The coefficient for the duration item ($\beta = 0.291$) was positive and highly significant, as expected. For the ReQoL-UI, dimensions were largely monotonic, aligning with our anticipations. Only four out of 28 coefficients were insignificant. Statistically significant decrements were observed for the most severe level of all dimensions. Among these, the utility decrement for the physical health dimension was larger than all other mental health-related dimensions. The “well-being” demonstrated the largest utility decrement among all mental health-related dimensions. The theoretical range of the utility score of ReQoL-UI in Hong Kong general population is between -0.781 and 1.0. **Conclusions** This study provides Hong Kong-specific preference weights for the ReQoL-UI, a new condition-specific PBM for mental health. The generated scoring algorithm and value set can be used by clinical professionals and policy makers to assess and compare the impact of mental health-related programmes and technologies on HRQoL in CUAs, thereby facilitating evidence-based resource allocation decisions.

1:30 PM –3:00 PM MONDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Lotus

Behavioral and Structural Determinants of Healthcare Utilization

MODERATOR: **Ama Pokuaa Fenny**,

Ind-1326 Do Maternal Incentives Generate Community Spillovers? Five-Year Follow-up Evidence from a Randomized Trial

PRESENTER: **Adeyemi Okunogbe**, World Health Organization (WHO)
AUTHORS: Edward Okeke, Isa Abubakar

Background: In low- and middle-income countries the underutilization of health care during pregnancy, childbirth, and in early childhood is a key contributor to high rates of child mortality. Demand-side innovations, often involving the use of monetary incentives, have been shown to induce greater utilization of health services, however little is known about the long run effects of such programs; in particular, very little is known about their community-wide effects. Do they affect long-run utilization by other households?

Methods: In 2017 we conducted a randomized trial in 2383 census areas in Nigeria, approximately half of which were assigned to a treatment arm in which expectant mothers were offered a cash incentive of N5000 ($14) payable if they attended antenatal visits, delivered in a health facility, and attended a postnatal visit, or to a control arm. The results of this trial have previously been published. Five years after this experiment we returned to the study communities to collect data on long-run outcomes. To investigate community-wide effects we recruited and surveyed a new sample of 7426 mothers, from both treatment and control areas, that did not participate in the original trial. Leveraging the original random assignment of communities to treatment or control, we study long-run treatment effects on health care utilization by non-participating households.

Results: Our preliminary results indicate a long-run increase in antenatal care use in intervention communities, indicating community-wide spillovers. Leveraging plausibly exogenous variation in the number of originally treated mothers in a community, we find suggestive evidence of network effects: effects are larger when there are more treated mothers. Further leveraging individual-level data on friendship networks, we find that these effects are driven by personal acquaintance with an originally treated mother.

Conclusions: Incentivizing households to use health care services in developing countries may not only impact outcomes within these

households, it may also have community-wide benefits. This has important implications for how we value these programs and provides additional evidence of their utility.

Ind-1497 The Impact of Supply Disruptions in a Social Marketing Program for Reproductive Health on Modern Contraceptive Use and Pregnancy Rates in Zambia

PRESENTER: **Sein Kim**
AUTHOR: Jessica Cohen

Background/Aim This study aims to examine the impact of disruptions in external funding, specifically the supply of heavily subsidized, socially marketed contraceptive commodities, on contraceptive use and pregnancy outcomes. In Zambia, family planning services have often been tied to HIV-targeted activities, which have been highly reliant on foreign donors. One such program, led by United States Agency for International Development (USAID), provided comprehensive support for social marketing for contraceptive commodities such as male and female condoms and oral contraceptives (pills) from the early 1990s until it ended in September 2014. From mid-2014 to September 2016, there was a funding gap for marketing and distribution of these condoms and pills, which resulted in reduced access to these commodities in the market. Previous studies have shown a positive correlation between the expansion of social marketing programs and contraceptive use; nevertheless, it remains uncertain how people would change their reproductive health behaviors in response to the abrupt end of the program. **Methods** The primary source of outcomes data is nationally representative secondary data from the Zambia Demographic Health Surveys (DHS) conducted in 2018, which includes month-by-month records of pregnancies, births, terminations, and contraceptive use (condom, pills, injectables, implants, intrauterine devices). We analyze the rates of modern contraceptive use, and pregnancy among 13,683 women aged 10 and 45 years between January 2013 and July 2015. We apply a difference-in-difference approach, and supplement the results with the synthetic control method, using calendar data from DHS surveys across 12 African countries. **Results** A roughly two-year halt in the social marketing program did not result in a change in pregnancy rate during the study period. In addition, the impact on the rate of modern contraceptive use was not statistically significant, although we observed an overall decrease in the contraceptive use after the disruption. This null result was from the substitution between different contraceptive methods. By specific contraceptive methods, we found the disruption led to decreases in male condom use by 48% (95% CI: -8%, -69%; $p<0.01$) and pill use by 9% (95% CI: -1, -18%; $p<0.05$), whereas injectable use increased by 9% (95% CI: 1, 14%; $p<0.05$) compared to the baseline. The results from the synthetic control approach confirmed a significant decline in the use of male condoms and pills after the funding cut. Heterogeneity analyses showed that the effect was larger among women living in urban areas, those aged above 20 years, single women, and women who had completed at least primary education. **Conclusion** Our study underscores the importance of a stable supply chain and government funding for contraceptives in low- and middle-income countries. Additionally, donors should carefully consider unintended consequences when modifying their implementation strategies or transitioning from one project to another. It is crucial to ensure a smooth phase-out process and engage in preemptive discussions with partner governments.

Ind-2544 Measuring Progress of Healthcare Accessibility for Cross-Provincial Migrants in China: A Nationwide Longitudinal Study

PRESENTER: **Minjiang Guo**, Institute of Medical Information, Chinese Academy of Medical Sciences & Peking Union Medical College

Background: The scale of migrants in China increased dramatically in recent 20 years, composing 26.6% of the Chinese population in 2020. Due to the fragmented basic medical insurance system, 70% domestic migrants in China has limitation to join in the health insurance scheme in host cities but rely on their hometown's, which caused many troublesome procedures for reimbursement and extremely **restrained healthcare accessibility**. To minimize the barriers of migrants' healthcare accessibility leading by reimbursement problems, a new online cross-provincial reimbursement solution had been implemented in 2016 nationwide. **This study aimed to measure the progress of healthcare accessibility for the cross-provincial migrants under this solution**.

Methods: Using data from China Family Panel Studies (CFPS) of 2016 and 2020, this study estimated the healthcare accessibility before and after the online reimbursement solution implementation. Cross-provincial migration status was differentiated by respondents' hukou status and residence during the survey period. We selected 3 indicators to measure healthcare accessibility differences between migrants and local people: "whether or not to have a treatment after illness" was used to illustrate the realized accessibility of healthcare, "annual per capital healthcare expenditure" and "out of pocket expense" (with logarithmic transformation) were applied to describe the financial accessibility. Propensity score matching (PSM) via logistic regression and 1:1 nearest neighbor matching conducted with a caliper of 0.5 standard deviation (SD) was adopted to resolve migration selection bias between the two groups. Binary logit model and logistic regression model were conducted to investigate whether the "migration status" was significantly influencing healthcare accessibility through this period. All the analysis were performed using Stata version 14.0.

Results: A total of 872 individuals in 2016 and 598 individuals in 2020 were included in the analysis after PSM. As the results showed, the treatment probability (OR=0.59, P=0.042) and annual healthcare expenditure (-0.36~0.2, P<0.001) of migrants were significantly lower than local population in 2016, but the disparity was disappeared in 2020. According to the financial protection, migrants' out of pocket expenses was significantly higher than local population both in 2016 and 2020, but the percentage had decreased more obviously in this period, which declined from 74.4% in 2016 to 48.4% in 2020, compared with local populations 58.8% to 36.8%.

Conclusion: This study demonstrated a significant increase of healthcare accessibility and financial protection for cross-provincial migrants after the implementation of the online reimbursement solution in China using a national representative datasets. Given the long distance away from insurance contribution place, online solutions would be a good option for migrants' healthcare coverage, and a effective supplement of universal health coverage. Despite the achievement of healthcare accessibility progress, it should be noted that a substantial disparity in healthcare financial burden was still existing between migrants and local populations due to the different health insurance benefits packages

designed by the flow-in cities and flow-out cities. Policymakers should make more efforts to promote the local health insurance participation of migrants or upgrade the pooling level, so as to completely eliminate the inequity of healthcare accessibility wherever people join in the insurance.

Ind-522 Referral of Patients in a Non-Compulsory Referral Healthcare System: a Survey Study Based on the Health Belief Model

PRESENTER: **Vivian Chia-Rong Hsieh**
AUTHORS: Ming-Chu Hung, Chiung-Hui Chen, Rung-Shiuan Gu

Background

Excessive healthcare resource utilization is a prevalent issue, particularly in systems lacking a compulsory referral system. This is evident in Taiwan, where patients can freely navigate the healthcare system without a primary care (PC) physician acting as a mandatory gatekeeper. Many policies have been implemented to facilitate the proper flow of patients. However, many patients still bypass PC and seek care directly at tertiary hospitals. The impact of potential factors, such as the lack of awareness and perceived inconvenience, on patient referral behavior requires further investigation.

Research Questions

The primary objective of this study is to compare the characteristics of patients with successful and failed upward referrals. Our secondary aim is to identify independent predictors of successful patient referrals in the Taiwanese context.

Methods

We conducted face-to-face surveys of 932 patients aged 20 years or older who had been referred by a physician between December 2020 and May 2021 in Taiwan. Participants signed consent forms before completing a self-developed questionnaire based on the Health Belief Model (HBM). The questionnaire was tested for reliability and validity. Due to the COVID-19 pandemic, we used a two-stage sampling and recruitment approach. A probability proportional to size sampling method was employed to ensure a nationally representative sample. The questionnaire measured general demographics, primary caregiver, comorbid illnesses, perceived threat, perceived referral benefits, perceived referral barriers, cues to action, self-efficacy, and knowledge about referral. Multivariate logistic regression was performed for the multivariate analysis. The study protocol was approved by the research ethics review committee.

Key Results

Of the 932 participants, 20.7% (n=193) experienced failed referrals (was not aware of being referred or did not visit the referred doctor), while 79.3% (n=739) had successful referrals. Among those with successful referrals, 64.5% (n=376) were referred from PC clinics, 18.7% (n=109) from district hospitals, and 16.8% (n=98) from regional hospitals. Statistically significant differences were found in age ($p<0.0001$), sex ($p=0.0001$), area of residence ($p<0.0001$), education ($p=0.0001$), employment status ($p<0.0001$), household income ($p=0.019$), primary caregiver ($p<0.0001$), and underlying comorbid illnesses ($p<0.0001$) between patients with failed and successful referrals. Differences in the HBM construct measurements like perceived referral barriers and cues to action were not statistically significantly across the two study groups. Adjusted analyses revealed that HBM constructs and knowledge about referral were not significant predictors of successful referral behavior. Conversely, age 60 years or older (aOR: 2.31, 95% CI: 1.08-4.95), female sex (aOR: 1.92, 95% CI: 1.23-3.01), and gastrointestinal diseases (aOR: 3.41, 95% CI: 1.33-8.76) were significant drivers of upward referral. Having parents as primary caregivers was associated with a decreased likelihood of successful upward referral (aOR: 0.35, 95% CI: 0.16-0.77).

Conclusions and Implications

Our findings suggest that the HBM constructs and patients' knowledge of referral processes may not be strong predictors of referral behavior in the Taiwanese healthcare system. Public health education initiatives alone may not be sufficient to encourage referrals. Other factors, such as the role of primary caregivers and the type of underlying disease, may play a more significant role in influencing patients' referral decisions.

Ind-1271 Beyond Price: Quality Competition in Germany's Statutory Health Insurance

PRESENTER: **Janice Schönfeld**, "Hamburg Center for Health Economics, University of Hamburg"
AUTHOR: Petra Steinorth

Introduction:
In Germany's statutory health insurance (SHI) system, 94 sickness funds serve over 70 million people, with approximately three percent switching providers annually. This study examines how ***quality competition*** impacts switching behavior by analyzing the influence of ***contribution rates*** and ***additional services*** on consumer choice, while also investigating effects on ***risk selection***.

Method:
The study employs a LASSO logit model to identify ***key predictors of switching behavior***, utilizing German Socio-Economic Panel (SOEP) data combined with sickness fund contribution rates and benefits portfolios. The sample includes 53,189 observations across 16,211 individuals aged 18 and older from 2014 to 2019.

Results:
The analysis ***confirms both price and quality competition*** within Germany's SHI system. Rising contribution rates ***push consumers toward alternative providers***, while lower rates ***create strong pull effects***. Quality competition operates independently of price factors, with consumers

attracted to enhanced service offerings. Switching patterns vary across population groups, with families showing heightened price sensitivity and distinct service preferences compared to individuals with different health statuses.

Conclusion:
The findings affirm quality-driven competition in the SHI system, with benefits significantly influencing insurer choice. While this suggests positive effects on care quality, it also indicates potential risk selection by sickness funds. These insights should inform policy decisions to balance consumer needs with SHI principles.

Keywords:
statutory health insurance · consumer preferences · health services

JEL Classification Codes:
G22, I11, I13, L22

1:30 PM –3:00 PM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Bali

Economic Evaluations of Cancer

MODERATOR: **Li Yang**,

Ind-2117 Cost-effectiveness of Multi-cancer Combined Screening for Early Detection: a Systematic Review

PRESENTER: **Yumeng Lv**

AUTHORS: Peigen Zhu, Li Yang, Yaqun Fu, Zhijie Nie

Background: Cancer is a leading cause of morbidity and mortality worldwide, with 20 million new cases and 9.7 million deaths reported in 2022. Meanwhile, there were 4.8 million new cases and 2.6 million deaths in China, imposing a substantial economic burden on patients and their families. Multi-cancer combined screening (MCCS) is a screening approach that simultaneously detects multiple cancers, enabling earlier diagnosis and improved patient outcomes. However, most studies focus on the cost-effectiveness of single-cancer screening, lacking comprehensive evaluations of MCCS. Evidence is urgently needed to guide policymakers in identifying cost-effective screening strategies and cancer types for combined screening. **Objective:** This study aims to summarize the cost-effectiveness of multi-cancer combined screening for early detection and to provide evidence supporting the usage of multi-cancer screening technology. **Methods:** A systematic literature review was conducted by searching both English and Chinese databases, including PubMed, Embase, Scopus, Web of Science, and CNKI. Articles published before April 1st, 2024 were included (PROSPERO registration number: CRD42024533740). The key words related to economic evaluation included “cost-effectiveness”, “cost-utility”, and “cost-benefit”, and those for the topic of interest included “screening”, “tumor OR cancer OR oncology”. CHEERS 2022 checklist was used to evaluate the quality of the included studies, data was extracted using a predefined table. Evidence profiles for each combination of screening method, cancer type, comparison, intervention, and outcome were created using the Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) approach. **Results:** Of the 40,272 papers identified, a total of 22 English and 4 Chinese studies met the preset criteria and were included. Of the 26 included studies, 17 were from high-income countries (HICs), eight were from less developed countries, and one provided combined evidence from both HICs and low- and middle-income countries (LMICs). Breast and ovarian cancer screenings showed mixed cost-effectiveness, while colorectal and upper gastrointestinal cancer screenings demonstrated more consistent benefits. The most commonly used combined screenings included multigene testing for breast and ovarian cancer and endoscopy for upper gastrointestinal cancers. Genetic screening and AI integration further improved cost-effectiveness, particularly in high-risk populations. The majority of included studies were of high quality. Studies were conducted from various perspectives, including societal, payer, and health system viewpoints, with commonly measured outcomes such as cancer detection, quality-adjusted life years (QALYs), and disability-adjusted life years (DALYs). Markov models and modeling simulations with a lifetime horizon were the predominant method for economic evaluations. Willingness-to-pay thresholds varied, with some studies using predefined fixed values, such as $50,000/QALY, while others applied GDP-based thresholds. Key factors influencing cost-effectiveness included cancer prevalence, screening costs, utility values of cancer states, and test sensitivity. **Conclusions:** This systematic review highlights the cost-effectiveness of multi-cancer combined screening compared to no screening or single-cancer screening. While high-income countries currently benefit most from multi-cancer screening, further research and real-world economic evaluations in less developed settings are essential to guide resource allocation and policy decisions. To maximize the impact of limited healthcare resources, policymakers should prioritize certain screening strategies.

Ind-1878 Breast Cancer Screening Using Clinical Breast Examination: A Cost-Effectiveness Analysis for South Africa

PRESENTER: **Sithabiso Daphne Masuku**

AUTHORS: Olena Mandrik, Noreen Mdege, Gauravi Mishra, Richard Muwonge, Gesine Meyer-Rath, Naomi Lince-Deroche, Alan Brennan

Background

According to the World Health Organization (WHO), screening and early diagnosis are key to reducing advanced cancer incidence and mortality. In low- and middle-income countries, breast cancer (BC) survival rates are low because of late detection. South Africa's 2017 BC control policy recommends twice-yearly clinical breast examinations (CBEs) for asymptomatic women aged 40-69. The cost-effectiveness of scaling up CBE screening coverage however remains unexplored. We estimated the impact of scaling up CBE screening coverage on BC mortality and screen-detection rates and the program's cost-effectiveness.

Methods

Using randomised clinical trial (RCT) data on downstaging (shifting diagnosis and treatment to earlier cancer stages), we compared two scale-up scenarios over 2023 to 2027 to a baseline of 5% coverage. Scenario 1 targeted 25% coverage by year 5 (5% annual increase), Scenario 2 75% by year 5 (17.5% annual increase). We evaluated the cost per disability-adjusted life year (DALY) averted using a two-part model: a decision tree tracking eligible women's breast health from screening to diagnosis and a state transition model estimating the downstaging of BC cases through screening, following diagnosed women over their remaining lifetime. Downstaging data came from a meta-analysis of two RCTs, stage distribution from a South African case series, mortality risk and life expectancy from WHO's 2019 Life Tables, and breast cancer incidence from South Africa's National Cancer Registry 2018 report. Costs were sourced from South African literature. Costs, evaluated from the healthcare payer's perspective, were presented in 2022 US dollars.

Results

Five-year screen detection rates were 2.39 and 2.08 per 1,000 women screened for Scenarios 1 and 2, respectively. At baseline in Year 5, 234,188 women were screened. Under Scenarios 1 and 2, the corresponding figures were 1,170,938 and 3,512,815, respectively. Over 5 years, Scenario 1 reduced BC mortality, measured in years of life lost (YLL), by 0.7%, while Scenario 2 achieved a 2.3% relative reduction. Across scenarios, the average discounted cost of screening and necessary diagnostic procedures per woman screened was approximately $30. The costs of screening and diagnosis for each screen-detected case of BC were $13,717, $12,653 and $14,476 for baseline, Scenarios 1 and 2, respectively. Relative to no screening, the current baseline screening program averted 1,645 DALYs at a cost of $20,341/DALY averted. Scenario 1 achieves 3,823 DALYs averted with economic efficiency improving to $17,776/DALY averted, whereas Scenario 2 averted 12,165 DALYs at $19,552/DALY averted. Model outcomes were most sensitive to assumptions regarding downstaging rates, followed by CBE sensitivity.

The South African opportunity cost-derived cost-effectiveness threshold (OCCET) is $3,015 per DALY averted, derived by comparing life expectancy gains and healthcare expenditure (2000 and 2015). Although CBE scale-up is not cost-effective under the OCCET, this metric alone does not dictate healthcare decisions in South Africa.

Conclusions

Scaling up CBE screening saves life years but is not cost-effective under the OCCET. However, the best screening policy depends on the government's willingness-to-pay. Additionally, screening initiatives will increase demand for diagnostic and treatment services. Therefore, establishing minimum care standards and evaluating cost-effective early detection methods is essential before scaling up screening.

Ind-1851 Introduction of an Organized Community-Approach Screening Programme for Cervical, Breast, and Oral Cancer in Bangladesh: A Cost-Benefit Analysis

PRESENTER: **Md Ragaul Azim**
AUTHORS: Md Mahfujur Rahman, Md. Habibullah Talukder, Md. Sirajul Islam, Syed Abdul Hamid, Quazi Nazmus Sakib

Background: Cancer is the third leading cause of death in Bangladesh, accounting for 7.7% of mortality, with breast and cervical cancer prevalent among women and lung and oral cancer among men, collectively causing 22.5% of cases and 18.3% of cancer deaths. High treatment costs, such as BDT 492,000 annually for cervical cancer, place a heavy burden on families, with 68.5% of healthcare costs paid out-of-pocket. Global programs, like organized cancer screening initiatives in Austria, Switzerland, and the Netherlands have significantly decreased cancer-related morbidity and mortality through early diagnosis and treatment; for example, Austria's organized breast cancer screening reduced mortality by 19.1% versus 14.2% with opportunistic screening. In Bangladesh, existing cervical and breast cancer screening is opportunistic, resulting in inconsistent coverage and delayed diagnoses. Introducing an organized community-based screening program would improve access to early detection and treatment.

Objective: This study aims to design a national, organized community-based screening program for cervical, breast, and oral cancers in Bangladesh and evaluate its cost-benefit ratio to guide implementation.

Methodology: A mixed-methods approach was adopted. Literature reviews, key informant interviews, and an analysis of the BSMMU screening program informed the program design. A pilot program was launched in a community clinic in Nawly, Jessore, to collect program cost data, including costs of investigations at nuclear centre and medical colleges for suspected patients. These costs were extrapolated for national estimates. Screening spots for national expansion were determined, assuming one spot per rural community clinic and one spot per 8,000 urban residents in city corporation areas.

Benefits were calculated by estimating the costs of a cancer case, assuming these would be saved if detected early. A survey of 346 cancer patients captured direct costs of advanced treatment, and the costs of precancerous cases were collected from literature. The difference between these costs was considered the direct cost savings from early detection. Indirect costs were assessed using the human capital approach, and DALYs captured gains from healthier and prolonged lives, with all future incomes discounted. Intangible costs were evaluated using the willingness-to-pay (WTP) approach, and provider costs were based on the difference between private and public hospital treatment expenses. An incidence-based approach estimated nationwide benefits. The overall cost-effectiveness of the program was determined by comparing extrapolated costs and benefits.

Key Findings: Operating one screening site costs BDT 20.06 lakh annually, while the national program cost is estimated at BDT 25.33 thousand crore, with a per-person cost of BDT 343. Preventing one cancer case saves BDT 38.50 lakh for oral cancer, BDT 42.90 lakh for breast cancer, and BDT 33.10 lakh for cervical cancer. The program could reduce the national cancer burden by BDT 39,940 crore annually. A

benefit-cost ratio of 15.77 indicates that the benefits far outweigh the costs, making the program highly cost-effective. It should be noted that the study is still in progress, and the findings remain preliminary.

Conclusions: An organized community-based cancer screening program for cervical, breast, and oral cancers provides a cost-effective solution to reduce the cancer burden and financial strain in Bangladesh.

Ind-902 Model Validation and Application to Evaluate Cost-Effectiveness of Lung Cancer Screening in Singapore

PRESENTER: **Junxing Chay**
AUTHOR: Eric Finkelstein

Introduction

Cancer screening offers the potential for better health outcomes but often at higher costs. Current approaches for simulating cancer screening outcomes rely on either simple stage-shift models or complex calibrated disease models, each with different levels of flexibility and data requirements. To strike a balance, we developed and validated a novel approach to simulate the distribution of stage and age of diagnosis under various screening programs defined by target population, age and frequency of screening. We then apply this method to evaluate the cost-effectiveness of select lung cancer screening paradigms in Singapore.

Methods

We derived an analytic solution to estimate the distribution of the stage and age at detection under hypothetical screening programs relative to the current distribution reported in cancer registry data. The derivation accounts for all possible windows of opportunity for detection and time-to-detection and incorporates program design parameters (eligible ages and screen frequency), adherence to screening guidelines, stage-specific test sensitivity, and cancer progression rates. We validated the model using lung cancer incidence data from the U.S. Surveillance, Epidemiology, and End Results (SEER) program following the introduction of low-dose computed tomography (LDCT) screening. We then extended our model to incorporate lifetime healthcare costs and quality-adjusted life years (QALYs) gained from screening. Using this extended model, we evaluated the incremental cost-effectiveness of LDCT screening in Singapore for different subpopulations (smokers, never-smokers with family history of lung cancer), screening starting age (40, 50, 60, 70) and frequencies (one-time, quinquennial, biennial, annual).

Results

Our model showed excellent external validity, predicting incidence of stage IV lung cancer in the U.S. with a mean absolute percentage error of 1.64%. Applying the model to Singapore, we found that biennial screening for smokers aged 60-80 was incrementally cost-effective (ICER SGD 48,650/QALY), based on a willingness-to-pay threshold of SGD 75,000/QALY. In contrast, quinquennial screening for never-smokers with family history aged 70-80 was incrementally cost-effective (ICER SGD 72,940/QALY). Sensitivity analysis suggested that the relative risk required for screening of never-smokers to be cost-effective ranged from 1.7 (quinquennial starting age 70) to 6.9 (annual screening starting age 40).

Conclusion Our novel method for evaluating the effectiveness of cancer screening offers a flexible, locally adaptable approach that addresses the limitations of existing simulation models. Moreover, this method is generalizable to other progressive chronic diseases, such as chronic kidney disease and eye diseases. In the case of lung cancer screening in Singapore, we found that screening is likely good value for money for smokers and never-smokers with a family history. However, the optimal strategy differs by underlying risk and age of cancer onset. Future improvements in test sensitivity for early-stage cancers or the use of blood-based biomarkers to identify high-risk individuals may improve cost-effectiveness.

Ind-234 Cost-Effectiveness Analysis of Colonoscopy for Screening Colorectal Cancer in Indonesia: A Markov Model Approach

PRESENTER: **I Kadek Suardiana**
AUTHORS: Dwi Endarti, Tri Murti Andayani

Colorectal cancer is one of the top three diagnosed cancers worldwide and the second leading cause of cancer-related deaths, imposing significant economic burdens. Early detection is crucial for effective management and curative surgeries. In Indonesia, colonoscopy is the primary detection method, particularly for high-risk individuals, but screening has not been widely adopted. Pharmacoeconomic studies are essential for evaluating the costs and effectiveness of colonoscopy screening for colorectal cancer in Indonesia. The results of this study can serve as a reference for developing policies regarding colorectal cancer screening use colonoscopy in Indonesia. This research employs cost-effectiveness analysis using a Markov model for a cohort of 100,000 adults aged 45, comparing screening and no screening scenarios. The cost-effectiveness analysis for colorectal cancer detection using colonoscopy in a healthy population adopts the perspective of healthcare providers. Costs and utilities are estimated over a 30-year time horizon. The Incremental Cost-Effectiveness Ratio (ICER) is expressed as a cost per unit of Quality-adjusted Life Year (QALY). One-way and probabilistic sensitivity analyses were conducted to address uncertainty. The ICER of screening colonoscopy compare to without screening for adult patients in Indonesia was cost-effective, valued USD 6,191.18/QALY located in quadrant I. The ICER value from the basic analysis is below the threshold of 3 times the Indonesia GDP (assumed USD 14,759.1). The intervention of colorectal cancer screening using colonoscopy is considered cost-effective Based on one-way sensitivity analysis, indicate that the factors most influential on the ICER value are discounting rate of utility and cost of treating colorectal cancer. Based on cost-effectiveness acceptability curve, in WTP threshold of USD 5,500, the probability of being cost-effective for colorectal cancer screening increases and consistently reaches 100% at a WTP level of USD 9,000. A 10-year interval detection strategy with colonoscopy is also the most effective approach for improving clinical outcomes, as this detection method provides greater benefits in terms of health and reducing disease risk. This

study is the first to investigate the cost-effectiveness of colorectal cancer screening using colonoscopy in Indonesia, and as such, it has several limitations. First, all the data used are derived from secondary data from previous studies, which may introduce bias when applied to the Indonesian context. Second, the Markov model used in this study does not specifically represent the actual clinical progression of patients with potential colorectal cancer. Third, the model is developed from the perspective of healthcare providers (hospitals), so the cost data utilized only includes direct medical costs. As conclusion, Colonoscopy screening in Indonesia is cost-effective when analyzed using a Markov model, as indicated by an ICER value exceeding three times Indonesia's GDP. Future research should explore alternative interventions, such as biennial colonoscopy, and compare them with other screening methods. **Keywords:** Pharmacoeconomics; Colorectal Cancer; Screening; Colonoscopy; CEA

Ind-1481 Integrating Primary Healthcare Into Post-Discharge Cancer Care for Older Patients: A Pragmatic Non-Randomized Controlled Trial and Cost-Effectiveness

PRESENTER: **Ran Li**
AUTHORS: Peipei Kang, Delanjathan Devakumar, Hassan Haghparast-Bidgoli, Therese Hesketh

Background

The increasing incidence and survival rates of cancers, driven by an ageing population, present a significant challenge to China's healthcare system. Cancer patients are managed almost exclusively within tertiary care with resulting overburdened services. * Recent policies recommend that primary healthcare centres (PHCs) adopt an expanded role in providing long-term cancer aftercare. Advantages include easier access and lower out-of-pocket costs compared to tertiary hospitals, but effective coordination between tertiary hospitals and PHCs for post-discharge cancer care remain limited. To address this, we conducted a pragmatic trial integrating PHCs into the aftercare of older cancer patients to investigate the clinical effectiveness and cost-effectiveness of this approach in China.

Methods

This pragmatic controlled trial was centred at a tertiary oncology hospital in Nantong, Jiangsu province, China and six PHCs—serving as step-down facilities. Patients aged 60 and older with lung, breast, colorectal, or prostate cancer were identified by tertiary physicians. Participants were assigned according to their preference, to either the usual care group, with aftercare from the tertiary hospital, or the intervention group, where the follow-up and aftercare plan was developed and monitored by tertiary physicians, but delivered by PHC doctors. Outcomes measured were hospital admissions, length of hospital stay, and the mean difference in health-related quality of life (HRQoL) at one-and three-months. Subgroup analyses investigated potential differential effects by treatment type at recruitment. A within-trial cost-effectiveness analysis was conducted from a modified societal perspective. Sensitivity analyses were conducted to check the robustness of the results. This trial was registered (ChiCTR2300073108).

Results

Of the 1,722 individuals screened, 755 patients were enrolled in the study between May 2023 and April 2024. Ninety participants were assigned to the intervention group and 665 to the usual care group. Intervention group patients had 43% fewer admissions to tertiary hospital at one month with no significant difference at three months. Patients who underwent surgery in the intervention group, had an 83% reduction in hospitalizations at one month (IRR = 0.17, 95% CI: 0.04–0.76) and a 61% reduction at three months (IRR = 0.39, 95% CI: 0.18–0.82), compared to control patients who received surgery. Patients in the intervention group had 4.68 fewer admission days within one month (95% CI: -7.92 to -1.44) and 4.26 fewer days within three months (95% CI: -8.47 to -0.06) compared to the control group.

Intervention group patients showed better HRQoL, at one month and three months, with a significantly higher adjusted HRQoL at three months (mean difference = 0.05, 95% CI: 0.01 to 0.08) compared to the control group. Integrating PHCs into cancer follow-up and aftercare was cost-effective, saving around 1130 USD in costs (95% CI: -1295 to -62) without a loss in QALYs for patients in the intervention group (mean different = 0.002, 95%CI: -0.004 to 0.008).

Conclusions

The integration of PHCs into post-discharge cancer care has proven to be a cost-saving approach that significantly reduces overall hospitalizations without compromising health outcomes. Further studies with long-term follow-up are needed to fully assess the benefits of integrating PHCs into cancer care.

Ind-1488 Estimating the Cost-Effectiveness of Tumor Treating Fields in Glioblastoma using Real-World Data from the TIGER Study

PRESENTER: **Bruce C. M. Wang**
AUTHOR: Bruce C. Wang

Background: Glioblastoma (GBM) is the most aggressive form of primary brain cancer, with a typical survival of 12 to 15 months, even with recent advancements in treatment. The standard of care, which includes surgery, radiation, and chemotherapy with temozolomide, offers limited success, and recurrence is highly likely. Tumor Treating Fields (TTFields) is a non-invasive treatment that has demonstrated extended survival in clinical trials for GBM patients. This study analyzes the incremental cost-effectiveness ratio (ICER) of TTFields in a real-world setting using data from the TIGER study, conducted between 2017 and 2019 in 81 centers across Germany. TIGER assessed real-world outcomes of 429 patients who received treatment (Intent-To-Treat population), with endpoints including overall survival (OS), progression-free survival (PFS), and safety.

Objectives: To assess the cost-effectiveness of TTFields + Temozolomide (TMZ) compared to the TMZ alone by estimating the ICER using real-world data from the TIGER study.

Methods: Data from the intention-to-treat (ITT) population of the TIGER study was used to model survival benefits, including life years (LYs) and quality-adjusted life years (QALYs). The model incorporated direct medical costs (e.g., treatment, adverse events, follow-up) along with health outcomes such as OS and PFS.

OS was estimated using a three-phase model: Kaplan-Meier survival curves from the TIGER study were used for the initial four years, followed by EF-14 data to extend the curve to 5 years. From years 5 to 15, conditional survival estimates from Porter et al. were applied, and general population mortality rates were used from year 15 onward. PFS was similarly modeled using KM data from the TIGER trial for the initial observed period. Beyond this, PFS was extrapolated using a Weibull distribution.

Utility values were sourced from published literature. A partitioned survival model with three health states (Stable Disease, Progressive Disease, and Death) was used to estimate lifetime QALYs. ICERs were calculated as the ratio of QALYs gained. Sensitivity analyses tested the robustness of the results, exploring variations in utility values, model assumptions, and input parameters.

Results: The ITT population from the TIGER trial demonstrated a 40% reduction in ICER compared to the EF-14 results ($117,953 vs. $197,336 per QALY), driven by consistent gains in life years and QALYs. LYs increased from 3.34 in EF-14 to 3.46 in TIGER (a gain of 0.12 years), while QALYs rose from 2.57 to 2.70 (a gain of 0.13). These findings align with the EF-14 trial results, highlighting comparable clinical benefits.

The one-way sensitivity analysis (OWSA), including a tornado diagram, revealed that TTFields Time on Treatment had the largest impact on the ICER, with a spread of $50,805 between the low and high results.

Conclusions: This analysis demonstrates the improved cost-effectiveness of TTFields in real-world settings, with reduced costs and enhanced survival. The gains in life years and QALYs highlight the economic advantage of TTFields. The TIGER trial confirms the survival benefits seen in EF-14, supporting TTFields as a valuable treatment option for glioblastoma and its continued integration into GBM treatment protocols.

1:30 PM –3:00 PM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Executive Room 2

Complex and Novel Economic Evaluations

MODERATOR: **Bonny Parkinson**, Macquarie University

Ind-673 Cost-Benefit Analysis of Extended Pharmacist Scope of Practice to Administer Influenza Vaccinations: Evidence from Ontario, Canada

PRESENTER: **Adrian Rohit Dass**, University of Toronto
AUTHOR: Audrey Laporte

The Scope of Practice (SOP) of pharmacists has received increased attention in Canada and internationally as a way of increasing access to health care services. The evidence to date suggests mixed results of extended pharmacist SOP on the total number of administered vaccinations. Moreover, there have been limited studies investigating potential returns to the health care system associated with SOP extensions, as well as heterogenous effects by rurality. The purpose of this analysis is to investigate the cost-benefit of a 2012 pharmacist SOP extension to administer influenza vaccinations in Ontario, Canada. We estimate interrupted time series models using administrative health data on the population of Ontario from 2010-2022. We investigate the impact on several influenza-related outcomes, including the number of patients vaccinated, expenditure on vaccinations, as well as physician and hospital visits. We find a statistically significant increase in the number of influenza vaccinations, with a larger effect in medically rural areas. We also find statistically significant reductions in physician and hospital visits for influenza. We calculate a return on investment (ROI) of $31.14 over the sample period, which implies that every $1 spent by the Ontario Ministry of Health from the 2012 pharmacist SOP extension yielded a return of $31.14 plus the original investment. This result is conservative as it does not consider the health effects associated with the reduction in influenza cases as well as productivity effects (e.g., fewer missed school and workdays). For policy making, the results suggest that extensions to the SOP of pharmacists is a way of increasing the availability of health care services as well as decreasing strain on physicians and hospitals. The results further suggest that the effectiveness of the extension may vary across regions, with stronger effects in medically rural areas.

Ind-1254 Cost-Effectiveness of a Weight Management Programme to Alleviate Symptoms of Long COVID

PRESENTER: **Heather Fraser**, SAMRC Centre for Health Economics and Decision Science - PRICELESS SA
AUTHORS: Naomi Brosnahan, Alex McConnachie, Michael Lean, Naveed Sattar, David N Blane, Emilie Combet, Janice Richardson, Catherine A O'Donnell, Emma McIntosh

Background

Following COVID-19 infection, some people experience long-term effects, termed Long COVID, significantly impacting quality of life and placing a burden on the National Health Service (NHS). Further, Long COVID carries a substantial economic burden at both individual and

societal levels. Therefore, evaluating interventions that may reduce the clinical and economic burden of Long COVID are of societal importance. Symptoms associated with overweight/obesity overlap with and may aggravate those of Long COVID. The Remote Diet Intervention to Reduce Long COVID symptoms Trial (ReDIRECT) reported the impact of a weight management programme on the self-reported symptoms of Long COVID in those living with overweight/obesity in the United Kingdom. The intervention is a remotely delivered, dietitian-supported programme of total diet replacement and food reintroduction, with weight-loss maintenance support. It is vital to understand value for money gained to inform decision-making on implementation of the intervention.

Aim: This economic evaluation alongside the ReDIRECT trial aimed to estimate the cost-utility of the ReDIRECT intervention, both within-trial and over the long-term.

Methods

Recruited participants (n=234) were randomly allocated to the intervention group, receiving weight management, or control group, receiving usual care. The within-trial economic evaluation estimated the cost-utility of the intervention at six months post-randomisation, compared to usual care. An NHS and Personal Social Services (PSS) perspective was used for the base case analysis, with a wider societal perspective used in a scenario analysis. Incremental Quality-Adjusted Life Years (QALYs) over the within-trial period were calculated using EQ-5D-5L data collected at baseline, three months, and six months. Intervention and healthcare resource use data collected over the trial period were used to calculate incremental costs, with work productivity and personal food costs included for societal perspective costs. Multiple imputation using chained equations was used to account for missing data, with seemingly unrelated regression models fitted on imputed datasets and 5,000 bootstrapped samples drawn. We modelled the long-term cost and health consequences of the intervention under a range of scenarios, with five time horizon scenarios and two scenarios of the relationship between time and treatment effect.

Results

The within-trial cost-utility analysis estimated an incremental cost-effectiveness ratio (ICER) of £16,424/QALY at six months post randomisation, with 86% probability of cost-effectiveness at a £30,000/QALY threshold, from an NHS/PSS perspective. When including broader societal perspective costs, an ICER indicating dominance of the intervention was estimated (-£11,319/QALY, with 96% probability of cost-effectiveness at a £30,000/QALY threshold). Preliminary results from the long-term model indicate that the cost-effectiveness increases with a longer time horizon.

Discussion

The within-trial analysis indicates that the ReDIRECT intervention is cost-effective in improving symptoms of Long COVID from an NHS/PSS perspective, compared to usual care. When a broader societal perspective is adopted, the intervention becomes potentially cost-saving, dominating usual care. Preliminary results from the long-term model indicate that the within-trial analysis results may be conservative if health benefits persist beyond the trial period, with intervention costs being upfront. Exploring long-term consequences of the intervention as well as uncertainty related to key model assumptions may better inform implementation of the intervention.

Ind-1318 Cost-Effectiveness of a Primary Healthcare Intervention: Improving Medicines Use in People with Polypharmacy in Primary Care (IMPPP)

PRESENTER: **Nouf S. Gadah-Jeynes**
AUTHORS: Jeff Round, Ammar Annaw, Rupert A Payne, Deborah McCahon

Background Polypharmacy and comorbidity are increasingly common, with main clinical management of polypharmacy taking place in primary care. This setting faces challenges in distinguishing between appropriate polypharmacy (optimised medication use) and inappropriate polypharmacy (medications misused or failing to deliver intended benefits). It remains unclear whether a targeted medications review in primary care is cost-effective, given inconsistent findings in previous research. The objective of the IMPPP trial was to assess the cost-effectiveness of the IMPPP trial from a UK National Health Service (NHS) perspective. **Methods** IMPPP is a pragmatic, open-label, two-arm cluster-randomised trial across 37 English general practices recruiting 1715 patients. The intervention included an informatics tool to identify patients with polypharmacy, followed by a medication review undertaken jointly between pharmacists and general practitioners. This was compared to control arm practices delivering usual care. Costs were derived from national health records, and QALYs were estimated via SF-12v2. Health economic costs and outcomes were collected at three time points: T1 (practice randomisation), T2 (pre-medications review/ eligibility check), and T3 (6-month post T2). Due to the time variation between T1 and T2 amongst practices, we adjusted for healthcare resource use 6-months prior to T1 in the cost analysis. Cost-effectiveness was assessed using multilevel modelling (MLM) with bias-corrected and accelerated bootstrapping to calculate 95% confidence intervals using multiple imputed datasets for the primary analysis. Patients and practices characteristics were adjusted for in the MLM. Additional one-way sensitivity analyses were conducted to explore uncertainty. **Results** Adjusted mean QALYs and costs were 0.611 in the intervention group and 0.607 in the control group and the difference of 0.004 (95% CI: -0.002 to 0.010 was not statistically significant. Adjusted means costs in the intervention group were £3,950 compared to £3,558 in the control group and the difference of £392.68 (95% CI: -£30.88 to £816.24) was not statistically significant. The probability of cost-effectiveness at the National Institute for Health and Care Excellence's £20,000/QALY threshold was 0%. In the sensitivity analysis, the complete case analysis resulted in a non-statistically significant difference in costs between intervention and control groups of £246.56 (95% CI: -£746.64 to £253.52) but a statistically significant gain of 0.019 QALYs (95% CI: 0.003 to 0.035). **Conclusion** Targeted medication review as implanted in the IMPPP trial is not cost-effective. The trial's lack of cost-effectiveness may be attributed to factors like evolving national polypharmacy guidelines, higher recruitment of pharmacists in control practices, and variations in clinical care during the trial. Despite this, IMPPP is one of the largest trials addressing polypharmacy with a comprehensive informatics tool, offering valuable insights for future research.

Ind-2140 The Cost-Effectiveness of Restricting Electronic Gaming Machines Via Policy Legislation to Reduce Problem Gambling in Victoria State of Australia

PRESENTER: **Upendra Dhungana**, Ministry of Health and Population, Department of Health Services, Nepal
AUTHORS: Long Khanh-Dao Le, Cathy Mihalopoulos, Yong Yi Lee

Background

Problem gambling is associated with a significant economic and health burden to Australian society. Problem gambling includes a range of negative outcomes for individuals, families and society. Several initiatives which target both supply of gambling avenues (such as restricting electronic gaming machines (EGMs)) and demand side initiatives (e.g., treatment of individuals who are problem gamblers), have been found to be effective in preventing and reducing problem gambling. This study aims to systematically review evidence of economic evaluations of interventions targeting the reduction of problem gambling followed by conducting a modelled economic evaluation to examine the cost-effectiveness of policy legislation to restrict the number of EGMs in Victoria, Australia.

Methods

In order to inform the model methodology, Medline complete, Embase, Econlit, APA Psych info, Business Source Complete and CINAHL databases were searched for economic evaluation of problem gambling reduction strategies up to June 2020. Pre-set inclusion and exclusion criteria were applied for selecting the studies. The intervention for the economic evaluation was enacting policy legislation to reduce 25% of EGMs while the comparator was 'do nothing' so that number of EGMs would remain the same. The economic evaluation was conducted using a cost-utility framework where outcomes were measured as quality-adjusted life years (QALYs) using a decision tree model over a one-year time horizon from both a health sector and limited societal perspective that included opportunity cost of excess spending to the gamblers, financial cost of divorce and separation to gamblers, productivity loss at work, cost of crime to government, cost of lost revenue to government and cost of lost employment to individual. Sensitivity analyses of key model parameters including alternative utility weights, increasing health sector cost and reducing cost of lost revenue to government and cost of lost employment were conducted to assess the robustness of results.

Results

The systematic search of the literature did not identify any economic evaluations for problem gambling prevention and reduction strategies. The policy legislation change to reduce the number of EGMs in Victoria by 25% was dominant (i.e., cost less and was more effective) over the 'do nothing' comparator from a health sector perspective. However, from a limited societal perspective the intervention was not cost-effective with an incremental cost-effectiveness ratio of A$688,020 per QALY gained. Sensitivity analyses showed that the intervention remained cost-effective even after making changes to several key model parameters.

Conclusions and Implications

This is the first study to inform policy makers on the cost-effectiveness of EGM restriction in Victoria. The implementation of proposed policy measure largely depends on whether decision makers prefer to adopt a health sector or limited societal perspective. However, there exists an ethical question as to how justifiable it is to include tax revenue in a societal context from addictive good which is causing harm to consumers. Future studies with longer time horizon and the incorporation of probabilistic and multivariate sensitivity analysis to test the robustness of findings are recommended.

Ind-2518 Reducing Frailty in a Pre-Frail Population: How Cost-Effectiveness of a Complex Intervention Depends on Patient Characteristics

PRESENTER: **Richard Edlin**
AUTHORS: Debra L. Waters, Avinesh Pillai, Leigh Hale, Anna Rolleston, Ngaire Kerse, Win Thu, Ruth Teh

Background

Evaluating complex interventions requires consideration of how effectiveness is mediated by implementation context, including a theoretical understanding of why an intervention might work and what this relies upon. This complexity also means that similar trials might produce results that depend on other factors, including patient characteristics. One area where results appear to differ in this way is in falls prevention in the elderly, and where exercise is used as an intervention.

Frailty is a precursor to functional loss and increased risk of falls, hospitalisation, and residential care admissions are closely associated with substantially higher health care costs. This SUPER study aimed to determine whether group-based strength and balance exercise (Steady As You GO, SAYGo) and /or nutrition education and cooking class (Senior Chef) is cost effective relative to social group (control group) in preventing progression of frailty in pre-frail older adults.

Aim:

We use data from SUPER, the recent New Zealand study seeking to reduce frailty in older people to discuss (1) the effectiveness and cost-effectiveness of the trial and (2) how these trial results might be understood in the context of previous New Zealand exercise studies, and how we might understand those studies in the context of findings from the recent trial.

Methods:

This study utilises a dataset from a 2x2 factorial, randomised, controlled trial that recruited 468 pre-frailty community dwelling adults aged ≥75 (≥60 for Māori and Pasifika Peoples) living in Aotearoa New Zealand. Resources included in the cost-effectiveness analysis: intervention costs, hospitalisation costs (from NZHIS) valued according to the type of hospital admission and length of stay. Quality of life (SF-12) at each time points (baseline, 3, 9, 15 and 24 months) were used to estimate quality-adjusted life years (QALYs) as an area under the curve, with value for money of the intervention assessed using incremental cost-effectiveness ratios. Bootstrapping was used to provide balance across trial arms based on baseline frailty status and prior orthopaedic hospitalisation (addressing baseline risk), with CEACs and CEF used.

To contextualise findings, we will compare patient characteristics across existing studies in New Zealand and attempt to consider the similarity of the patient characteristics. Using an exemplar historic study, we will attempt to bootstrap the current trial data to match prior trial characteristics, to assess how much of the difference between trial results might be explained simply by patient characteristics.

Key results:

Our analysis of trial data suggests that exercise combined with the nutritional intervention and cooking class dominates other alternatives at 24 months (58% likelihood of cost-effectiveness at $30k/QALY). However, exercise in isolation of this support was not cost-effective (CEAC 1% at $30k/QALY).

Conclusions:

The study suggests that the cost-effectiveness of exercise in a patient group also depends on the degree that other needs are met; it is complex. Early results suggest that some of the differences between trials can be explained by recorded patient characteristics. Future trials should carefully consider how baseline patient data is collected and might be informed by analysis of previous trial data.

Bali International Convention Centre – Nusa Dua

Special Session: Student Paper Prizewinners

MODERATOR: **Tinna Laufey Asgeirsdottir**, University of Iceland

Aversion to Income, Ethnic, and Geographic Related Health Inequality: Evidence from Australia

PRESENTER: **Ms. Marie-Anne Boujaoude**

AUTHORS: Kim Dalziel, Richard Cookson, Nancy Devlin, Natalie Carvalho

This study investigated the Australian general public's views on trade-offs between reducing health inequalities and improving total health. It elicited relative equity weights, comparing inequalities in life expectancy at birth across three equity-relevant dimensions: income (comparing poorest versus richest fifth), ethnic (comparing Indigenous versus non-Indigenous), and geographic (comparing rural/remote versus major cities). A benefit trade-off exercise was administered via online survey to a sample of Australian adults (n=3,105) using quota sampling to ensure population representativeness across key demographic variables (age, gender, state of residence, household income and education level). When comparing income groups, 88% (95% Confidence Interval (CI): 82% - 92%) of the respondents were health inequality averse, with 42% (95% CI: 34% - 51%) demonstrating extreme inequality aversion. When considering Indigenous status, 85% (95% CI: 79% - 90%) showed inequality aversion, and 40% (95% CI: 31% - 49%) displayed extreme aversion. Lastly, looking at different geographic locations, 74% (95% CI: 66% - 80%) of the respondents were inequality averse, with 37% (95% CI: 29% - 46%) showing extreme inequality aversion. The relative equity weights were calculated, allowing for varying baseline inequalities in life expectancy – proportional gaps of 10.8%, 5.1% and 6.3%, respectively. The results imply that the public is willing to weight incremental health gains to the poorest fifth five times more than to the richest fifth, six times more for Indigenous versus non-Indigenous, and four times more for people living in rural and remote areas compared to major cities.

The Causal Link from Vaccination Policy to Government Trust: A Regression Discontinuity Analysis

PRESENTER: **Hidetoki Nakayama**, University of Osaka

AUTHORS: Shusaku Sasaki, Tomoya Saito, Fumio Ohtake

Public trust in government is a critical determinant of compliance with policies during crises such as economic downturns and pandemics. The reverse causal relationship—that implementing effective policies can enhance trust in government—has also attracted interest, but remains under-explored and empirically untested. The current paper addresses this gap by examining the causal link from policy implementation to trust, using the COVID-19 vaccination roll-out as a case study. Leveraging a regression discontinuity design (RDD) based on Japan's vaccination prioritization for individuals aged 65 and older, along with a novel panel survey conducted before the policy's implementation, we identify the causal effect of vaccination on public trust. Our estimations suggest that while the vaccination did not alter trust in the central government responsible for policy design, it significantly increased trust in local governments tasked with policy execution. Notably, this effect was more pronounced among women, a demographic whose mental health was disproportionately affected during the pandemic. Further analysis indicates that this increase in trust was driven by the tangible benefits of having received a vaccine rather than anticipations stemming from policy design and initiation. Our findings highlight the potential for governments to build public trust through effective, well-executed policies, thereby providing an incentive for ensuring policy completion.

Timing Matters: The Impact of Unconditional Cash Transfer Payment Frequency on Dietary Choices Among Vulnerable Elderly Consumers

PRESENTER: **Deivis Guzman-Tordecilla**

AUTHORS: Antonio Trujillo, Andrés Vecino Ortiz, Shu Wen Ng

Low-income elderly consumers, often overlooked in studies of public financial assistance programs, may face challenges in managing resources to maintain dietary health. This study examines how the payment frequency of an unconditional cash transfer program impacts dietary behaviors among low-income elderly populations in Colombia. Using nationally representative data from a federal financial assistance program, we implement a Multivalued Treatment Model with Propensity Score Matching and Augmented Inverse Probability Weighting to assess the causal effects of monthly versus bi-monthly payments on food expenditures, dietary diversity, and diet quality. Results show that monthly payments consistently enhance dietary diversity and diet quality by supporting healthier food purchases compared to bi-monthly payments. Subgroup analyses revealed that older seniors and males benefit most from monthly payments. Mechanisms explored include consumption smoothing, subjective wealth perceptions, and self-control, with findings highlighting the benefits of subjective well-being of more frequent and predictable income flows. The study advances consumer behavior theory by linking payment frequency to dietary outcomes and offers practical implications for optimizing financial assistance programs. While bi-monthly payments reduce administrative costs, monthly payments are recommended to improve dietary health. These findings contribute to understanding income timing's role in fostering healthier consumer behavior.

Unintended Effects of Delayed Marriage on Women's Attitudes Toward Intimate Partner Violence: Evidence from Cambodia

PRESENTER: **Yuki Kanayama**, Keio University

Child marriage is considered a primary cause of intimate partner violence (IPV) in developing countries, but few studies have examined the causal relationship. Using individual-level data from Cambodia, we show how delayed cohabitation affects the attitudes of ever-partnered women toward IPV. To isolate exogenous variation, we use age at menarche as an instrumental variable for age at first cohabitation. Our estimates indicate that delayed cohabitation makes women *more* tolerant of IPV. Furthermore, it lowers the probability that women work or own a bank account, their control over reproductive health, and spouses' educational attainments. In our data, men's educational attainments are negatively associated with their gender bias. This implies that later-married women marry more gender-biased men, leading to limited economic autonomy, less decision-making power, and worse attitudes toward IPV. We argue simply inducing women to delay first cohabitation without improving gender norms or women's education may have unintended consequences.

1:30 PM –3:00 PM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Nusantara 1

Costs, Outcomes and Cost Effectiveness Methods

MODERATOR: **Ewan Tomeny**, LSTM

Ind-1780 Origins, Development and Future of Health Economic Evaluation: Perspectives from Health Economics and Decision Science

PRESENTER: **Philip Clarke**

AUTHORS: Michael Drummond, Milton Weinstein, Louise Russell, Sophie Cole

Abstract

This study explores the evolution of health economics, focusing on the development of economic evaluation methods through historical analysis and insights from key figures in the field. Originating in the mid-20th century, economic evaluation transitioned from cost-benefit to cost-effectiveness analysis, initially applied in non-health contexts by the US military before being adapted for healthcare. Herbert Klarman pioneered the application of cost-effectiveness analysis in healthcare, particularly in evaluating treatments for chronic renal disease, establishing foundational principles that remain relevant today. The study draws on a historical interview with Klarman, where he discussed influences on his career, including his academic relationship with economist Milton Friedman that help him get established in health economics.

Building on Klarman's seminal work, this study features interviews with three leading figures from the next generation of health economists and decision scientists: Michael Drummond, Louise Russell, and Milton Weinstein. Their contributions include innovations in cost-effectiveness guidelines, the quality-adjusted life year (QALY) metric, and the integration of health economics into public policy. Interviews conducted in 2022–2023 provide unique perspectives on their career trajectories, intellectual influences, and landmark contributions to the field.

Drummond's work includes the development of economic evaluation guidelines and co-authoring influential textbooks that have shaped best practices. Russell's research emphasized the rigorous evaluation of preventive interventions, challenging assumptions about their cost-saving potential. Weinstein, instrumental in formalizing QALY and decision science methodologies, broke ground with publications in medical journals, bridging economics and clinical practice.

The interviews reveal shared themes: early challenges in gaining academic and policy recognition, the importance of mentorship, and the integration of diverse disciplines such as statistics, mathematics, and public policy. Reflecting on their most influential work, the interviewees highlight how their research has informed current health technology assessments, including the standards set by the UK's National Institute for Health and Care Excellence (NICE).

Contemporary challenges, such as adapting to gene therapy and managing early drug approvals with limited data, are discussed alongside enduring debates about thresholds and equity considerations in cost-effectiveness analysis. The interviewees emphasize the need for future research to address systemic costs borne by patients and caregivers, as well as methodological advancements for evaluating long-term and personalized treatments.

This study not only documents the historical development of health economic evaluation but also identifies key lessons and future directions for the field. It provides a detailed account of the growth of cost-effectiveness analysis as a critical tool for policy and clinical decision-making worldwide.

Ind-2295 OpenMarkov, an Open-Source Software Tool for Cost-Effectiveness Analysis

PRESENTER: **Francisco Javier Díez**, Universidad Nacional de Educaci n a Distancia (UNED)
AUTHORS: Manuel Arias, Manuel Luque, Carmen María Yago, Jorge Pérez-Martín

Cost-effectiveness analysis (CEA) consists of comparing two or more interventions to determine which one provides the greatest benefit at a reasonable cost. Since direct empirical comparison is usually not feasible due to various types of constraints (ethical, budgetary, etc.), CEAs are usually based on computational models such as decision trees, Markov models, and discrete event simulations. Building decision trees, either with or without Markov nodes, is complicated, especially for CEA, because in this case the tree can have only one decision, which must be the root of the tree. Markov models are typically implemented in Excel, which is not a programming language, making the models difficult to build, debug, and maintain; this difficulty increases when the implementation includes modeling tricks such as memory states or tunnel states. Coding them in a language such as R, C++, or MATLAB is difficult for health economists who are not expert programmers, and verifying their correctness is difficult for the recipient of the model, usually a health technology assessment agency. An alternative to these "traditional" tools is the use of probabilistic graphical models (PGMs), which have been developed in the field of artificial intelligence since the 1980s. They are based on a combination of causal graphs built from expert knowledge and probabilistic parameters obtained from clinical or epidemiological data. Bayesian networks, used for diagnosis, are much more accurate than the naive Bayes method, which consists of multiplying the likelihood ratios of the findings. Influence diagrams (IDs) can perform CEAs on problems involving several decisions; some IDs for medical problems having a few dozen nodes are equivalent to decision trees having tens of thousands of branches. Decision analysis networks (DANs) are similar to IDs but more flexible because they do not require a total ordering of the decisions; for example, they can be used to determine the optimal order of multiple tests with cost-effectiveness criteria. Similarly, Markov influence diagrams can model temporal problems and perform CEA much more easily than when using spreadsheets, and represent much more complex models than when using a programming language such as R or C++. Finally, discrete event simulation (DES) can be done with another type of PGM, called DESnets. Building a PGM for a medical problem and coding the corresponding CEA algorithms in a programming language would be a daunting task for health economists. Fortunately, there is an open-source software tool, OpenMarkov, that supports all of these types of PGMs. Its graphical user interface (GUI) allows both experts and novices to build complex causal models with relative ease, without writing a single line of code. This tool has been used in more than 30 countries, from top universities, U.S. government research agencies, and large multinational corporations to students who cannot afford to pay for commercial licenses. Being free and easy to use makes OpenMarkov a useful tool for teaching CEA, especially in low- and middle-income countries (LMICs).

Ind-1361 Selecting Reliable and Efficient Methods for Value of Information Estimation: Insights from a Simulation Study

PRESENTER: **Qian Xin**
AUTHORS: Haji-Ali Abdul-Lateef, Mr. Howard Thom, Mark Strong

Background Healthcare resource allocation decisions are subject to uncertainty due to the imperfect information available in economic evaluations. While collecting new evidence can help reduce uncertainty in decision-making, it is often associated with higher costs. Therefore, finding an optimal balance between reducing uncertainty and managing the costs of evidence collection is essential. Value of Information (VOI) analysis provides an analytical framework that can be used to estimate the value of acquiring additional information to inform a decision-making process. Expected value of partial perfect information (EVPPI) offers insights into the price a healthcare decision-maker would be willing to pay to obtain perfect information for factors influencing the decision. Several methods are available for computing EVPPI, including the traditional two-level Monte Carlo simulation (2LMC), model regression techniques (such as Gaussian process (GP), Multivariate adaptive regression splines (MARS), and Bayesian additive regression trees (BART)), and multi-level Monte Carlo (MLMC). However, the reliability and efficiency of these VOI analysis methods have not been systematically validated, leaving a gap in guidance for selecting the most appropriate method in varying scenarios. ### Objective This study aims to conduct a simulation study to evaluate the reliability and efficiency of different VOI methods and provide insights on selecting methods suited to specific circumstances. ### Methods A generic Markov model was developed to randomly generate base-case inputs and associated uncertainties for varying numbers of health states, treatment options, and correlation levels. Cost and utility values are derived from a uniform distribution, while copulas are used to generate transition probabilities with different levels of correlation. Based on the simulated base case inputs and associated uncertainty, costs and utilities were sampled from normal distributions, while transition probabilities were sampled from a Dirichlet distribution. To estimate the EVPPI, we used the GP, MARS, and BART methods from the BCEA package, along with the MLMC method from the mlmc package, with the 2LMC serving as the gold standard for comparison. We compared the speed and accuracy of EVPPI estimation across different methods, considering varying levels of model complexity. All models were developed in R 4.4.1 and executed on the high-performance computing platform. All code are provided in a GitHub repository. ### Results Among the methods evaluated, BART and MARS were the fastest in estimating EVPPI, outperforming GP, MLMC, and 2LMC, especially as the number of health states and parameters increased. When the true EVPPI value is small, GP, BART, and MARS tend to return zero, whereas MLMC often yields negative values. MLMC provides more accurate estimates when (1) more parameters are included in the analysis; (2) the true EVPPI value is relatively large; and (3) the included parameters possess a certain degree of correlation. ### Conclusion This study highlights the strengths and limitations of various EVPPI estimation methods, emphasizing the superior speed of

BART and MARS, while demonstrating that MLMC achieves greater accuracy under specific scenarios involving complex models and higher parameter correlations.

Ind-1192 Going Beyond Direct Health Gains. How to Incorporate a Societal Perspective in Asia-Pacific Decision-Making? A Consensus-Building Process.

PRESENTER: **Matthias Hofer**
AUTHORS: Lotte Steuten, Martina Garau, Claud Theakston

Health Technology Assessment (HTA) agencies provide recommendations on health technology use within health systems, often relying on economic evaluations. These evaluations may adopt a healthcare system or societal perspective. The healthcare system perspective, which focuses solely on direct intervention costs and benefits, is widely utilised in systems aimed at maximising health within limited budgets. However, adopting a societal perspective, which considers broader value elements, could better align with public preferences, government objectives (such as equity and economic growth), and the HTA's mandate by maximizing societal welfare.

In the Asia Pacific region, while HTA agencies acknowledge broader value elements and societal perspectives in their methodological guidelines, best practice guidance is lacking, and there is considerable variability in how these elements influence decision-making. Challenges to adopting a societal perspective in HTA include the absence of standard methodologies, limited empirical evidence for certain technologies, and budgetary silos within the public sector. Our study aims to address these barriers by developing policy recommendations to support the systematic and effective integration of societal perspectives and broader value elements in Asia Pacific HTA decision-making.

We utilised a consensus-building approach with HTA experts from diverse Asia Pacific jurisdictions, each with experience in existing HTA systems or methodologies to incorporate a societal perspective. Initially, we conducted an online survey to assess current HTA practices, identify opportunities and challenges, and prioritise key value elements. Following this, a structured virtual discussion allowed experts to propose and discuss recommendations, and explore implementation challenges. To frame our analysis, we applied a framework that outlines the steps necessary for adopting change in HTA processes, focusing on willingness for recognition in guidelines, ability for measurement and incorporation into decision-making, and evidence to demonstrate impact and value.

Preliminary results from the survey align with previous literature, confirming that current recognition and incorporation of societal perspectives in Asia Pacific countries remains low. Experts identified barriers such as capacity restraints and lack of robust and validated methods for measurement and decision-making, which contribute to a lack guidance for stakeholders, and lack of evidence on individual technologies. Nevertheless, some opportunities can be leveraged, including methodological advancements, governments' recognition of the societal value of innovative health technologies, and collaborations among HTA agencies that can support method alignment.

We found support for adopting the societal perspective and incorporating broader value elements in decision-making in Asia Pacific. Key recommendations to achieve full recognition and implementation were to prioritise specific aspects of societal value at the local level, and improving methods and evidence generation. Additionally, experts emphasised the importance of multi-country HTA collaborations (such as HTAsialink), knowledge sharing, capacity building, and development of case studies from real-world treatments as critical enablers for a broader assessment of the value of health technologies in Asia Pacific.

Ind-318 Rapid Development of Cost-Effectiveness Analyses to Scale Global Health Interventions

PRESENTER: **Andrew Wang**
AUTHORS: Caroline Tangoren, Savannah Newman, Mark Minnery, Julianne Bruggemann, Philip Riegert, Sindhika Jai, Mary Qiu

Background: In global health, decision-makers often face tight resource and time constraints when selecting interventions to pursue. Cost-effectiveness analysis (CEA) using averted disability-adjusted life-years (DALYs) is crucial for prioritizing interventions, yet limited impact evaluation and costing data, particularly for new programs, often hinder comprehensive CEA model development. A rapid approach to CEA development is needed to support timely, evidence-based decisions by national governments, large-scale funders, academic institutions, and implementing organizations. **Objective:** This study proposes an approach for rapid CEA development and presents lessons learned from its application in identifying and scaling evidence-backed, cost-effective health interventions in Africa and Asia. **Data and methods:** The proposed approach for rapid CEA development includes: 1) Impact estimation leveraging modeling techniques and existing data from literature, assessed for internal and external validity; 2) Evaluation of program impact based on breadth and depth, considering the scale of implementation required for cost-effectiveness; 3) Definition of target population, expected coverage, and adherence rates; 4) Utilization of national or subnational burden data, assessed for applicability to the target population; 5) Estimation of marginal impacts above a counterfactual scenario to assess the added value of an intervention. The counterfactual is triangulated through stakeholder interviews with government partners, existing baseline data, and quasi-experimental data from monitoring and evaluation; 6) Initial bottom-up costing for early-stage CEAs, followed by detailed budget development; and 7) Ongoing maintenance of CEAs using cost actuals and monitoring data for intermediary outcomes to track whether programs meet CE expectations. We present two case studies from the experience of Evidence Action, an implementation organization supporting at-scale, cost-effective programming: 1) Evaluation of a prospective program for intermittent preventive treatment of malaria in school-age children (IPTsc) using early-stage CEA to guide decision-making; and 2) Continued evaluation of a longstanding safe water program through chlorine dispensers operating in Kenya, Uganda, and Malawi. **Results:** The study illustrates each of the proposed approaches for CEA development and maintenance. For IPTsc, CE considerations in Kenya, Uganda, Tanzania, Nigeria, and Malawi are based on available data, with identification of two key uncertainties in the program scenarios and an evidence gap for the extent to which IPTsc results in community-level benefits. Key CE results for Safe Water Now over a range of years show examples of how CE has influenced expansion and changes to program design over time. **Conclusions:** Our rapid CEA development approach presents significant implications for global health policy and practice. This streamlined methodology enables evidence-based decision-making despite data limitations, facilitating timely intervention selection and resource allocation. The approach's adaptability supports iterative refinement as new

data emerges, serving the evolving needs of both implementers and funders. Its flexibility accommodates diverse implementation strategies across national governments and organizations, allowing real-time adjustments to changing program parameters. This less resource-intensive CEA methodology represents a potential advancement toward more responsive and effective decision-making in global health.

1:30 PM –3:00 PM MONDAY [Health Care Financing & Expenditures]

Bali International Convention Centre – Surabaya

Insurance Design and Risk Pooling

MODERATOR: **Stephen Jan**, The George Institute for Global Health

Ind-332 The Impact of Occupational Disease Claims on the Sustainability of Indonesia s National Health Insurance System

PRESENTER: **Levina Khoe**

AUTHORS: Muchtaruddin Mansyur, Virginia Wiseman, Augustine Asante

Background

The true burden of occupational diseases (ODs) is still unknown in Indonesia. Anecdotal evidence suggests a significant underreporting problem. The costs of ODs are typically paid through the work accident insurance scheme (JKK), which is administered by the Social Security Agency for Workers (BPJS-TK). However, only 41.6% of the total workforce are members of the BPJS-TK, leaving a significant number of workers uninsured for occupational diseases. There is a general perception in Indonesia that the real costs of ODs are borne by the National Health Insurance System (JKN) and employees through out-of-pocket health payments.

Objective

To compare OD claims processed through the JKK and JKN to determine potential cost shifting between the two insurance schemes and assess how this impact on the sustainability of the JKN.

Methods

We performed a secondary data analysis using JKK and JKN claims data from 2018 to 2022. Initially, we developed a list of potential ODs by ICD-10 codes using three sources of information: evaluation report on potential occupational diseases in JKN claims, JKK claims data, and Minister of Health Regulation No 11 of 2022. Using this list, we estimated the number of suspected ODs by multiplying the number of cases for each potential OD with the proportion of OD, which was obtained from the BPJS-K evaluation report and WHO/ILO joint estimates on the global burden of OD. We calculated potential underreporting rate of ODs by dividing the number of suspected OD cases in JKN claims by the total expected OD cases (the sum of JKN and JKK claims). Potential cost shifting was estimated by subtracting the total claims processed through JKN from JKK claims. We then modelled the potential cost shifting over five years (2023 - 2027), using a 5% reporting rate as the base scenario and two additional scenarios with reporting rates adjusted to 20% and 50%.

Results

A list of 266 potential ODs was created based on the ICD-10 codes for suspected ODs. The total JKK claims for medical costs of confirmed ODs ranged between IDR 6.5 and 318.3 million from 2018 to 2022, while for the same period, the total JKN claims for suspected ODs were IDR 32.5 to 46.2 billion. The potential cost shifting was estimated between IDR 32.0 to 46.1 billion. If this condition persists, the JKN would lose about IDR 223.8 billion by 2027 based on the 5% reporting rate. These accumulated losses could be reduced to IDR 188.5 billion and IDR 117.8 billion by 2027 if the reporting rate is increased to 20% and 50%, consecutively.

Conclusions

Our study reveals a significant cost shift from JKK to JKN in terms of paying for OD claims, which if continues, could negatively impact the sustainability of the JKN. A comprehensive occupational disease reporting policy is urgently needed to address this issue. An important first step would be to improve the current reporting system by coding a *work-relatedness flag* on the JKN claims using the list of ICD-10 codes for suspected ODs and facilitating a linkage with JKK claims.

Ind-2484 Does JKN Shield the Vulnerable? Exploring Financial Burden of Hypertensive Patients in Surabaya: A Cross-Sectional Study

PRESENTER: **Nur Sahila**

AUTHORS: Laela Agrista Devilia, Muhammad Rizky Widodo, Thinni Nurul Rochmah

Background: Indonesia faces a public health challenge with a hypertension prevalence rate of 30.4%, as reported in the 2023 national health survey. This condition is recognized as catastrophic, leading to considerable healthcare expenditures. In response, the government established the National Health Insurance Program (JKN) to provide financial protection for its citizens. Despite a decade of implementation, evidence regarding JKN's effectiveness in alleviating catastrophic health expenditures and out-of-pocket costs varies. Surabaya, the second-largest metropolitan city, ranks second in hypertensive patients in East Java and has enrolled all its citizens in JKN since 2021. However,

evidence of the program's effectiveness in protecting against catastrophic and out-of-pocket expenditures is lacking. This research aims to analyse the relationship between JKN health insurance ownership and catastrophic and out-of-pocket expenditures among hypertensive patients in Gading Regency, Surabaya. **Method:** This study utilizes a quantitative research design employing a cross-sectional method. Purposive sampling was conducted to recruit patients with essential hypertension attending Puskesmas Gading in Surabaya. The inclusion criteria were patients diagnosed with essential hypertension within the past year and residing in the Puskesmas Gading area, while multimorbidity patients were excluded. Based on these criteria, 97 respondents were included. The gathered data were then analyzed using Chi-square tests and logistic regression to assess the association between the variables of interest. **Result:** The majority of respondents were female (85.6%), non-contributory beneficiaries (*Penerima Bantuan Iuran*) of JKN (74.2%), and aged over 60 years (68%). A significant portion of the respondents were homemakers (53.6%), reported utilizing services at the Puskesmas (Primary Health Care) (84.5%), and had never been hospitalized (96.9%). Statistical analysis revealed that participation in the JKN scheme was significantly protective against catastrophic health expenditures (OR: 0.8; p-value: <0.0001) and high out-of-pocket costs (OR: 4.31; p-value: <0.0001). Additionally, Pairwise Two-Sided Multiple Comparison Analysis showed a significant difference in total expenditures between contributory members of JKN and non-contributory beneficiaries of JKN (p-value: 0.0017). **Discussion:** The findings indicate that the JKN program offers protection against out-of-pocket and catastrophic expenditures. However, non-contributory beneficiaries still face significant differences in out-of-pocket costs compared to contributory members. The low hospitalisation rates and high reliance on Puskesmas align with the PROLANIS program, reflecting the effectiveness of primary healthcare services in managing hypertension. Future research should focus on longitudinal studies to evaluate the long-term impact of JKN and consider socioeconomic contexts. **Conclusion:** In conclusion, this study highlights that ownership of BPJS Kesehatan significantly reduces the incidence of catastrophic health expenditures and out-of-pocket costs among hypertensive patients in Gading Regency, Surabaya. While the program provides substantial financial protection, non-contributory beneficiaries still experience notable out-of-pocket expenses compared to non-recipients. More needs to be done to explore long-term impacts in varied socioeconomic contexts to inform policy improvements. **Keywords:** Financial Burden, JKN, Hypertension, Universal Health Coverage

abs-os337 Estimate the Financial Burden of the 5 Most Prevalent Non-Communicable Diseases Among the Population and Assume Its Impact on the GDP up to 2030

PRESENTER: **Mohammad Wahid Ahmed**

AUTHORS: Zakir Hossain, Shehrin Shaila Mahmood, Khadija Islam Tisha, Kamrun Nahar, Sayem Ahmed

Non-communicable diseases (NCDs) are one of the most public health risks globally. Bangladesh and other low- and middle-income nations comprise about 77% of all NCD-related mortality. As per the multi-sectoral action plan for preventing and controlling NCDs 2018-2025, WHO has recognized five diseases as most prevalent in Bangladesh: cardiovascular diseases, chronic respiratory diseases, hypertension, diabetes, and cancers. The declaration of UN Sustainable Development Goal Number 3 (SDG-3) demands each member state achieve Universal Health Coverage (UHC) by 2030 and financial risk protection. Service coverage for NCDs remained stagnant or deteriorated in most low- and middle-income countries like Bangladesh, and households face increasing out-of-pocket expenses (OOPE). The study mainly focuses on widespread economic disruption and the households having NCDs seem to be pushed towards much more hardships in terms of OOPE in Bangladesh.

We used the Household Income and Expenditure Survey (HIES-2016) dataset is national representative data and population-related information that was born by the Population and Housing Census 2022 by the Bangladesh Bureau of Statistics (BBS). The study explored the OOPE of the top 5 most prevalent NCDs and projected up to the year 2030in Bangladesh. The prevalence of cardiovascular disease, chronic respiratory disease, hypertension, diabetes, and cancer was found 5%, 12.5%, 20%, 7.8%, and 0.91% respectively in different secondary sources. OOPE of the top 5 most prevalent NCDs (in millions) from the year 2016 to 2030.

We estimated overall OOPE for the top 5 most prevalent NCDs was BDT 1,096,410 million in the year 2016. A gradual increase in OOPE was observed over the year. At present, the overall OOPE for the top 5 most prevalent diseases stands at BDT 1,172,254 million. Finally, the projected OOPE for the top 5 most prevalent NCDs is about BDT 2,896,469 million in 2030. We found that the gross domestic product (GDP) growth rate, OOPE as the percentage of GDP, and the percentage change in total OOPE gradually increased in the percentage changes in the total OOPE for the top 5 most prevalent NCDs from 2016 to 2030. Our study explores the variation of OOPE of the top 5 most prevalent NCDs among the Bangladeshi population, assuming its impact on the GDP up to 2030. The findings of this study may push policymakers and service providers to key evidence of the next developing Operation of the Government of Bangladesh.

Ind-1639 Enhancing Allocative Efficiency in Health Financing Through Annual Priority-Setting & Donor Coordination Under Malawi's One Plan, One Budget Reform

PRESENTER: **Jacqueline Crowell**

AUTHORS: Francis Zhuwao, Thulasoni Msuku, Stephanie Heung, Mihereteab Teshome, Gerald Manthalu, Andrews Gunda

Background: Approximately 55% of Malawi's health budget is donor-funded, leading to fragmentation and constraining efficient resource allocation. Since 2011, the Ministry of Health's (MoH) Resource Mapping (RM) exercise has created a strong foundation for understanding health sector funding flows. With data typically collected every 2-3 years, the long timeframes between RM cycles and its mapping of funding towards high-level strategies, rather than annual operational priorities, has limited the exercise's impact on donor coordination and allocative efficiencies.

In response, the MoH has outlined a bold vision for aid alignment in the Health Sector Strategic Plan III: 2023-2030 (HSSP III), which aims to promote allocative efficiencies through evidence-based strategy-setting. Under the HSSP III's "One Plan, One Budget, One Report" reform, the MoH, with CHAI's technical assistance, launched the "One Plan" process. This includes MoH-led setting of annual HSSP III operational priorities, followed by mapping of government/donor funding against these priorities. Structures like Technical Working Groups (TWGs) are intended to monitor "One Plan" implementation and promote resource reallocation towards priorities.

Research question/methods: This study aims to assess if an annual, iterative process of government-led priority-setting and donor coordination can improve Malawi's health sector aid alignment. A case study approach was used to document the MoH's operationalization of the HSSP III's "One Plan" reform during its initial two implementation years from June 2023-March 2025. Key indicators, like the percentage of major donors with funding mapped in the "One Plan" and percentage of financing aligned with "One Plan" priorities, were measured. Grey

literature, including “One Plan” tools and funding databases, were reviewed. The authors also draw upon their experiences in implementing “One Plan” processes.

Results: From the first to second year of the reform, there were important process improvements in “One Plan” development, including earlier stakeholder engagement and the adaptation of tools for donor mapping against operational priorities. This led to improved completeness of “One Plan” data and timeliness of dissemination, supporting the proactive identification of unfunded priorities for resource mobilization. From 2023/24-2024/25, external funding aligned with HSSP III priorities increased from 70% to 80%. Despite this progress, MoH and donor feedback indicate that the utilization of the “One Plan” by partners for priority-setting and resource reallocation remains limited due to a lack of fungible resources and misalignment with donor funding cycles. “One Plan” integration within grant-making processes, which often involve verticalized priorities predefined by donors and different stakeholders with varying awareness of the “One Plan”, remains inadequate, while “One Plan” oversight and monitoring by TWGs is limited.

Conclusions/implications: As the MoH’s guiding framework for health financing, effectively operationalizing the HSSP III is critical for mitigating fragmentation and maximizing Malawi’s limited funding. Health sector structures should be strengthened to support planning, funding reallocation, and improved efficiencies. Schedules for sector-wide planning should be harmonized with donor cycles, and the “One Plan” should be used at the outset of proposal development processes to support funding alignment. To strengthen joint accountability, “One Plan” indicators should be incorporated into the health sector’s monitoring and evaluation system.

Ind-2492 Does Health Insurance Protect Against High Cost of Maternal Care? Evidence from Ethiopia, Kenya, and India

PRESENTER: **Catherine Arsenault**, The George Washington University
AUTHORS: Aleksandra Jakubowski, Sein Kim, Sailesh Mohan, Brian Arwah, Anagaw Derseh Mebratie, Theodros Zemedu, Margaret Kruk, Monica Chaudry, Jacinta Nzinga

Background Governments in LMICs are expanding the enrollment in national health insurance schemes to improve financial protections for their citizens. The extent to which these schemes reduce out-of-pocket (OOP) expenditures for maternal care remains underexplored. We used a unique longitudinal dataset that tracks women’s real-time experiences with health system along the maternal care continuum. **Methods** The eCohorts study tracked the experiences of 3,032 pregnant women in Ethiopia, Kenya, and India. Women were enrolled at first antenatal care (ANC) visit and were called repeatedly during pregnancy, after delivery, and during postnatal care (PNC) period. We grouped OOP spending to direct costs (fees, medicines, test, laboratories) and indirect costs (transportation, food, accommodation) and assessed whether health insurance mitigates expenditures along the care continuum. We also assessed the relationship between OOP spending, healthcare quality, and user experience. Models controlled for facility type, delivery type (vaginal vs. C-section), delivery complications, primiparity, rural residence, marital status, education, and wealth. **Results** Most women (>95%) in Ethiopia and Kenya incurred some OOP costs of maternal care, while 28% of women in India received completely free care. The median (IQR) cost of maternal care was $43.6 (16.6, 99.1) in Ethiopia, $48.2 (12.0, 169.9) in India, and $36.2 (16.3, 69.9) in Kenya. The largest contributor to OOP spending were direct costs of deliveries, particularly C-sections and births in private facilities. Health insurance did not significantly reduce the probability of OOP expenses in Ethiopia or Kenya. In India, women were 14pp ($p<.01$) less likely to pay direct costs and 11 pp ($p<.05$) less likely to have indirect costs for ANC. Insurance did not affect direct OOP cost of delivery and increased indirect OOP costs by 12 pp ($p<.05$) in India. Insurance did not affect the level of spending in Ethiopia and India. In contrast, insurance significantly *increased* spending in Kenya: $6.5 ($p<0.001$) more on direct ANC costs, $2.5 ($p<0.001$) more on indirect ANC costs, and $0.80 more on PNC ($p<0.05$). OOP costs were catastrophic (>10% of annual income) for 24% of women in Ethiopia and 23% of women in Kenya (data collection is ongoing in India) and insurance was not protective from catastrophic costs. Higher OOP spending on ANC was associated with better quality in all countries. For delivery services, the relationship between OOP spending and quality varied: higher spending was associated with improved quality in Ethiopia but lower quality in Kenya. In Ethiopia, higher delivery costs correlated with better user experience, while no such associations were found in India or Kenya. **Conclusion** Significant gaps remain in the financial protection offered by insurance schemes in LMICs, potentially slowing enrollment growth. Having insurance did not protect from incurring high OOP costs of maternal care. Along the care continuum, women spent most on direct costs of delivery services, particularly C-sections. Using private facilities may be an effort to receive better care, but we found no consistent evidence that paying more translates to better quality or user experience.

Ind-1674 Health Financing Reform in Nepal: Bridging the Gap Between Resources and Disease Burden

PRESENTER: **Achyut Raj Pandey**
AUTHORS: Kjell Arne Johansson, Krishna Kumar Aryal, Shiva Raj Adhikari

Background: From 1990 to 2019, Nepal underwent a significant transition in disease burden, shifting from Communicable, Maternal, Neonatal, and Nutritional (CMNN) diseases to Non-Communicable Diseases (NCDs). However, the alignment of health system priorities with this transition has lagged. This study examines the changing disease trends from 1990 to 2019 and their alignment with resource allocation decisions. Furthermore, it assesses the future health expenditure landscape and explores strategies to better align resource allocation decisions with Nepal's evolving disease burden. **Methods:** Data on disease burden were obtained from the Global Burden of Disease (GBD) Study 2019. Resource allocation data were collected from the Line Ministry Budget Information System of Nepal and the Financing Global Health Data Visualization Portal of the Institute for Health Metrics and Evaluation. We analyzed notes from Joint Annual Reviews (involving government and non-government health partners) conducted between 2017 and 2022 to identify potential strategies for healthcare financing reforms to address growing health needs. Additionally, we reviewed notes from consultative workshops organized by the Ministry of Health and Population, which engaged over 100 policymakers, program implementers, civil society organizations, and service users. These workshops provided insights into possible options for harmonizing resource allocation decisions with the evolving disease burden. **Key results:** In 1990, CMNN diseases caused 63.6% of deaths, but by 2019, NCDs accounted for 71.1%. Despite this shift, CMNN diseases, responsible for 21.1% of deaths and 29.3% of DALYs in 2019, received 83.21% of the health budget. In contrast, NCDs, contributing to 71.1% of deaths and 61.2% of

DALYs, received only 14.27%, while injuries (7.8% of deaths and 9.6% of DALYs) received 2.62%. Health spending was $19.93 per capita in 1990, rising to $51.58 in 2019 and projected to reach $61.62 in 2030 and $85.95 in 2040. Participants in workshop highlighted Nepal's extended epidemiological transition, with NCDs dominating the disease burden alongside significant CMNN challenges. They recommended prioritizing health interventions based on cost-effectiveness, equity impact, disease severity, and strategic relevance to guide resource allocation. Governance reforms—such as harmonizing fragmented social security schemes (87 schemes implemented by 11-line ministries), granting additional decision-making space and financial flexibility for local governments, and enhancing transparency—could reduce inefficiencies and create resources to meet growing healthcare demands. **Conclusions and implications for policy:** A significant change in the burden of disease has been observed in Nepal which does not align with resource allocation decision. Prioritization of health intervention with multi-criteria decision-making process need to be institutionalized to align resource allocation decision with evolving disease burden. Besides, changes in service governance like harmonization of financing schemes, improving efficiency and transparency are needed.

Ind-1598 How Fee-for-Service Price Change Incurs Cost Shifting to Prospective Payment System: Evidence from China

PRESENTER: **Lai Yi**
AUTHORS: Fu Hongqiao, Ma Chao

Background: The existence and impacts of "cost shifting" have been examined in existing theoretical and empirical literature but with mixed results (Aghamolla et al., 2024; Chernew et al., 2021; Clemens and Gottlieb, 2017; Dranove et al., 2017; Frakt, 2011; McGuire and Pauly, 1991; Rizzo and Zeckhauser, 2003; Wagner, 2016; White and Wu, 2014). Minimal studies focused on cost shifting behavior in developing countries. The highly segregated regional health insurance system and heavily skewed distribution of high-quality medical resources in developing countries brings an important payer for local providers in resource-rich cities --- the nonlocal patients who move outside their usual residence to seek healthcare in these cities. Providers can cost shift between local patients and non-local patients. This study investigates the existence of this kind of cost shifting behavior in developing countries. **Method and Results:** Taking an FFS Price-Cutting in a large southern city of China as a natural experiment, this study examined the responses of public hospitals and whether cost shifting existed. In China, the nonlocal patients who move outside their residences to seek healthcare in resource-rich cities pay by fee-for-service, while the local-insured patients mainly pay by the prospective payment system, giving hospitals room to cost shift. The FFS Price-Cutting eliminated the markup of medical consumables fee (5%-10% markup) since 2019 without changing the local prospective payment system. This study utilized the continuous difference-in-difference method and leverage variation in the exposure to the Price-Cutting across different hospitals (pre-reform consumables ratio) to identify the effects. Moreover, we supplement a heterogeneous analysis to detect cost-shifting. We obtained a random sampling claim data of both local-insured and nonlocal-insured patients from the administration in G city, with 200 thousand observations for local-insured and 360 thousand for nonlocal-insured. We found that the Price-Cutting has increased medical service expenditures and the likelihood of receiving procedures for both types of patients as expected. For nonlocal-insured patients, we found a decrease in both consumable expenditures and total expenditures, causing hospital revenue loss. In contrast, for local-insured patients, we found no measurable change in consumables expenditures, an increase in total expenditures and reimbursement, and even a reduction in illness severity. Further analysis showed that public hospitals relied more on revenue from patients who pay purely by Fee-for-Service, like nonlocal patients, experienced a larger increase in reimbursement of local-insured patients by conducting more procedures, suggesting that hospitals offset the income loss from nonlocal patients by inducing more demand from local-insured patients. We found fiscal subsidies to public hospitals can alleviate strategic response. **Discussion and Implication:** Our study extends this line of literature on cost shifting by investigating an important local/nonlocal setting in developing countries and showing whether the price change in FFS payers influences the PPS payers. These findings implied the importance of monitoring the cost shifting between local and nonlocal patients, and the coordination of their payment methods matters. **Keywords**: Cost Shifting, Price Regulation, Provider Behavior, Interregional Patients, Case-based Payment

Ind-794 Adverse Selection or Beneficial Selection in Dual Western Medicine Traditional Chinese Medicine Insurance Markets

PRESENTER: **Xiyin Chen**
AUTHOR: David Bishai

Voluntary health insurance in Hong Kong offers an add-on option to cover Traditional Chinese Medicine (TCM). In Hong Kong, this option is typically chosen by 10.7% of the total population. If adverse selection dominates, individuals with higher expected healthcare needs are more likely to choose TCM-inclusive coverage, biasing estimates of utilization upwards. However, TCM's holistic appeal could attract people who are more attuned to health and wellness, leading to beneficial selection. The beneficial selection effect could bias utilization estimates downwards. We use IV models to detect the direction of the bias. Our instrument set is the insurance coverage by occupation and lagged year. Our findings support the beneficial selection hypothesis. IV estimates are two to four times larger than non-IV estimates, indicating that those with a lower propensity to utilize outpatient healthcare services self-select into TCM-inclusive coverage. Using instruments to control for bias due to self-selection, TCM-inclusive coverage significantly increases both TCM and WM utilization across extensive and intensive margins, with lower out-of-pocket (OOP) spending, indicating both moral hazard and a complementary relationship between TCM and WM.

1:30 PM –3:00 PM MONDAY [Health Beyond The Health System]

Bali International Convention Centre – Jakarta B

Social Determinants of Health

MODERATOR: **Jaithri Ananthapavan**,

Ind-299 Worker Mental Health During Australia's Great Work-From-Home Experiment: The Moderating Roles of Intensity, Job Control and Social Support

PRESENTER: **Anam Bilgrami**, Macquarie University

Background: Robust causal evidence on working from home (WFH) and mental health is lacking, with concerns raised during the pandemic that WFH blurs work-home boundaries and is harmful for worker health. The COVID-19 pandemic created an interesting work-from-home (WFH) 'experiment'. During the period of lockdowns, many workers were forced into high-intensity WFH due to public health mandates. Following these lockdowns, the world of work had been transformed with greater allowance and ability to work from home. **Research Aim:** In this study, I aimed to estimate the causal impact on mental health from working from home during and beyond the period of lockdowns. **Methods:** I used an event study difference-in-difference strategy to identify the effects of WFH on mental health, drawing on individual-level panel data from approximately 6,500 Australian workers who were continuously employed over the period 2019 to 2022. This sample was drawn from the Household, Income and Labour Dynamics in Australia panel survey. Heterogeneity analyses were performed using interaction terms. **Results**: WFH in lockdown years (2020-21) significantly deteriorated mental health, particularly for those working most (75-100%) hours from home ('high intensity WFH)', for females, including those with dependent children. During the lockdowns, negative mental health impacts of WFH were also concentrated in workers with both high and low levels of perceived social support. In the year immediately after lockdowns (2022), WFH was not associated with either significant improvements or deterioration in worker mental health, on average, but there is suggestive evidence of slightly better mental health for males without dependent children and people working 25-50% of their hours from home. Relatively larger negative mental health impacts were estimated for workers with a perceived low level of control in their jobs, and these persisted even in the post-lockdown year. **Conclusions:** Claims and concerns of a 'rapidly growing mental health crisis' from WFH apply mostly to the unique period of lockdowns, and do not seem generalisable, on average, to WFH after this period. Nonetheless, worsened mental health from WFH persisted beyond lockdowns for workers with low levels of perceived control in their jobs. Overall, mental health impacts of WFH are likely interconnected with worker choice and capacity to benefit, and a one-size-fits-all approach to setting WFH arrangements may be inappropriate.

Ind-374 Birth Order Effects on Children's Time Use in Activities Linked to Health and Human Capital: Evidence from Australia and the United States

PRESENTER: **Danusha Jayawardana**, Monash University

AUTHORS: Nicole Black, Gawain Heckley

Background: Recent research shows that birth order affects health and human capital outcomes, yet there is limited empirical evidence on the underlying mechanisms. ***Objective:*** This study is the first to investigate how birth order affects children's time use across key activities that are important for health and human capital development. ***Data:*** We use data from two sources – the Longitudinal Study of Australian Children (LSAC) and the Child Development Supplement (CDS) of the U.S. Panel Study of Income Dynamics (PSID). These are the only two datasets that provide detailed time-use diaries for children from birth to age 15. ***Method:*** As birth order is exogenously determined, we employ ordinary least squares (OLS) to estimate the effect of birth order on various time-use activities important for child health and human capital. We examine time spent on sleep, school, enrichment activities, digital media, physical activity and social activity, comparing first-borns with later-born children while conditioning on family size and other observerable characteristics. **Results:** Despite differences in countries and time periods, our results are strikingly consistent: later-born children spend less time on enrichment activities and more on digital media, compared to first-born children. Further investigation reveals that part of the birth order effect is driven by parents spending less time with later-born children compared to first-borns. However, later-borns also independently devote less of their *own* time to enrichment activities, suggesting that personal time use may be an important mechanism behind the well-documented impact of birth order on human capital development. We find evidence that later-born children experience more lenient parenting, which may help explain this pattern of own time use. Our results are robust to several sensitivity checks, including tests for coefficient stability, accounting for the censored nature of time use in certain activities, and adjustments for multiple hypotheses testing. ***Conclusion:***Given parental time with children and rules around digital media decrease as birth order increases, support for parents to enable them to have sufficient time to actively engage with, supervise and set rules around digital media for their later-born children may be fruitful avenues to explore to help reduce birth order inequalities in human capital outcomes.

Ind-390 Retirement Financing and Health Outcomes Among Australian Adults: How Saving for Retirement Also Saves Lives

PRESENTER: **Tran Phu-Duyen**

AUTHORS: Paula Lorgelly, Mohammad Salimifar

As aging populations exert increasing pressure on pension systems worldwide, understanding the relationship between retirement financing and health outcomes has become critical. While previous research indicates a link between financial security in retirement and overall health, there is a notable gap in studies analyzing this relationship within the Australian context, especially concerning the impacts of superannuation contributions. This study aims to fill this gap by examining how employers' and individuals' contributions to superannuation funds affect the health outcomes of Australians adults. Using longitudinal panel data from the Household, Income, and Labour Dynamics in Australia (HILDA) survey spanning from 2002 to 2018, we employ Ordinary Least Squares (OLS) regression models to analyze the impact of retirement financing on general and mental health outcomes. The dataset includes waves 2 to 18, with a four-year gap between relevant modules, allowing us to assess both immediate and lagged effects of superannuation contributions. Our findings reveal that both employer and personal superannuation contributions positively impact the health outcomes of older Australians, with personal contributions demonstrating stronger and more sustained effects. Notably, contributions made four years prior significantly enhance general and mental health, particularly among retirees, suggesting compounding benefits from early financial planning. These results underscore the importance of proactive retirement saving behaviors and the role of personal agency in financial planning. The study concludes that enhancing financial planning and implementing policy reforms that encourage increased personal contributions to superannuation funds could support healthy aging. By "nudging" retirement savings, policymakers can potentially improve health outcomes in the aging population, reduce future strain on healthcare systems, and promote overall well-being.

Ind-467 Socioeconomic Disparities in the Prevalence and Incidence of Sensory Impairment in Australia: Evidence From Panel Data

PRESENTER: **Mohammad Nure Alam**
AUTHORS: Mutsa Mutowo, Yvonne Tran, Kompal Sinha, Bamini Gopinath

Abstract

Background: Sensory impairment is a growing global public health concern. Previous research on the socioeconomic association with sensory impairment is mostly cross-sectional and uses limited socioeconomic measures. In this study, we use 20 years of panel data and multiple socioeconomic indices to investigate the socioeconomic association on the prevalence and incidence of visual and dual sensory impairment.

Method: Data was driven from the Household Income and Labour Dynamics in Australia (HILDA) survey, which included 9,472 individuals spanning 20 years. The Least Absolute Shrinkage and Selection Operator (LASSO) machine learning method was applied to select significant predictors through variable selection. The association between socioeconomic status and the prevalence of visual and dual sensory impairment was estimated using multivariate logistic regression analysis. A Cox proportional hazard model was employed to assess the socioeconomic association with the incidence of visual and dual sensory impairment.

Results: The lowest level of household wealth [OR =2.25 (95% CI 1.33-3.82)] and household income [OR =3.43 (95% CI 1.73-16.1)] were statistically significantly associated with vision and dual sensory impairment prevalence, respectively. Employment status was found to have a lower risk of the prevalence of vision [OR =0.43 (95% CI 0.29-0.64)] and dual sensory impairment [OR =0.32 (95% CI 0.13-0.78)] relative to unemployment. The longitudinal analysis showed that the lowest level of education [HR =1.23 (95% CI 1.09-1.36)]), the lowest income [HR =2.42 (95% CI 2.21-2.66)], the lowest household wealth [HR =3.22 (95% CI 2.89-3.57)] and living in a disadvantaged neighbourhood [HR =1.88 (95% CI 1.64-1.97)] to be significant risk factors for vision impairment incidence. Similarly, the lowest level of income [HR =4.11 (95% CI 3.41-4.96)] and residing in disadvantaged areas [OR =2.03 (95% CI 1.78-2.32)] were found to be major risk factors for dual sensory impairment incidence. Being employed had a reduced hazard of vision impairment [HR =0.85 (95% CI 0.80-0.91)] and dual sensory impairment [HR =0.68 (95% CI 0.60-0.77)] relative to unemployment.

Conclusion: The study identified significant socioeconomic inequalities in vision and dual sensory impairment in Australia. These findings highlight the importance of targeted interventions to ensure more equitable health and healthcare outcomes, particularly for disadvantaged groups.

Ind-1162 The Infodemic-Pandemic Nexus: Analysing the Impact of Misinformation on Population Health

PRESENTER: **Yuxi Wang**

Objectives Throughout history, infectious diseases have claimed more lives than any other cause. Despite remarkable technological progress in managing disease outbreaks, as seen in pharmaceutical advancements, the COVID-19 pandemic has underscored the essential role of non-pharmaceutical interventions (NPIs) like social distancing, self-isolation, and vaccination. Major challenge in public health response lies in the widespread resistance to effective epidemic measures, sometimes fuelled by media, influential figures, extremist politicians, and pervasive online mis/disinformation — what has been termed an “infodemic”. This research aims to systematically analyse how health-related mis/disinformation spreads from online platforms to offline behaviours, ultimately influencing population health outcomes. Specifically, we investigate (i) How infodemic during the pandemic affects individual behaviours, using vaccine refusal and civil resistance to non-pharmaceutical interventions (NPIs) as proxies; (ii) The impact of such behaviours on population health outcomes, including infection rates and excess mortality. **Methods** We analysed data on online misinformation, public health records, and protest events across 32 countries. We first use a mixed-effects model with country-level random effects, designed to analyse the relationship between rates of epidemic outcomes and the level of misinformation (referred to as the "infodemic"), along with several control variables across different countries and time trends. The dependent variable, excess mortality rate, is modelled as a function of the infodemic level with a time lag that is identified with the best model fit, as well as control variables such as policy responses, GDP per capita, population density, and the Human Development Index (HDI). The model includes a baseline morality time trend using a non-parametric approach based on B-spline bases to capture temporal variation. We also use structural equation modelling (SEM) to analyse the direct and mediated effects (perception, opinion changes, protests) due to infodemic intensity. The robust framework allows for the quantification of how misinformation cascades through behavioural mechanisms to influence public health outcomes. **Results and Conclusions** Our findings reveal a significant association between the spread of unreliable online information (with time lags) and increased new case rates and excess mortality rates. This relationship is mediated by behavioural factors, including civil protests against non-pharmaceutical interventions and vaccination uptake. This study represents one of the first multinational investigations into the behavioural mechanisms linking online misinformation to real-world health outcomes.

Ind-1215 What Drives Mental Health Disparities Across Occupations in Denmark? An Investigation of the Role of Employment Conditions and Industry-Specific Risks

PRESENTER: **Riccardo Di Francesco**
AUTHOR: Seetha Menon

Background: In today’s rapidly evolving work environment, understanding the impact of employment conditions on employee mental health is increasingly critical. This is particularly pressing in Denmark, where nearly one in three individuals experiences psychological challenges at some point in their lives. Despite this, the last comprehensive assessment in Denmark was conducted in 2005. Recent studies have focused narrowly on specific industries and occupations and relied heavily on self-reported data, which introduces endogeneity issues such as social desirability bias, systematic non-response, misclassification, and under-reporting. Our project addresses these limitations by leveraging matched employer-employee longitudinal Danish registry data, complemented by text data from company disclosures, stock market information,

Glassdoor ratings, and accounting statistics.

Data: We utilize comprehensive administrative data spanning 1995–2023, provided by the Danish government, encompassing the entire employed population in Denmark. These data include extensive details on both firm and employee characteristics. Mental health outcomes are assessed through three indicators: *i)* diagnosis-specific information confirmed by a psychiatrist or doctor, *ii)* antidepressant prescriptions, and *iii)* days of absence due to personal illness. To enhance this data set, we integrate annual reports submitted by Danish firms to the Danish Business Authority at the end of their fiscal year. These reports, which include financial statements, management commentary, and other disclosures, offer a deeper understanding of firms' behaviors and priorities beyond conventional financial metrics.

Methodology: We will employ advanced clustering methodologies to classify industries and occupations based on their relative risk to employee mental health and use machine learning predictive models to identify specific occupational risk factors. Additionally, we will examine how employees' mental health has evolved across occupations over the past two decades. Using time-series clustering, we will propose an alternative classification based on the trajectories of employees' mental health. Finally, state-of-the-art text analysis algorithms will assess whether and how firms prioritize employee mental well-being in their annual reports.

Expected findings: We anticipate uncovering substantial mental health disparities across industries, with employees in high-stress sectors exhibiting higher rates of mental health-related healthcare utilization. Additionally, our analysis is likely to highlight significant differences in how industries and firms address employee mental well-being. With data collection and cleaning complete, alongside access to advanced pre-trained neural network-based text analysis models, our team is well-positioned to meet project milestones and present robust findings at the conference.

Policy impact: Our findings will empower organizations to pinpoint occupations and industries at higher risk of burnout and early departure, enabling the design of targeted interventions and prevention strategies. Given Denmark's reputation for strong work-life balance and equitable healthcare, our findings will likely represent a lower bound of mental health disparities. Therefore, insights from Denmark will provide an invaluable benchmark for other countries seeking to address workforce mental health challenges effectively.

Ind-2182 Resilience and Effectiveness of Coping Strategies Against Health Shocks in Households with Non-communicable Diseases in Nigeria

PRESENTER: **Adelakun Odunyemi**
AUTHORS: Hamid Sohrabi, Khurshid Alam

Background: Health shocks, particularly those relating to non-communicable diseases (NCDs), are among the most common and severe shocks households in low- and middle-income countries (LMICs) like Nigeria must contend with due to significant out-of-pocket health expenditures and income losses. The effect of health shocks on household welfare depends on the household's pre-shock resilience capacity and the coping strategies adopted to mitigate them. Therefore, building resilience has topped the developmental agenda in disaster risk reduction, climate change adaptation, and food security interventions. However, studies on households' resilience capacities against health shocks remain scant. Furthermore, available research primarily focuses on identifying the determinants of resilience capacities, leaving their effects on households largely unexplored.

Similarly, studies on household adoption of coping strategies in response to health shocks have concentrated on their prevalence and determinants, neglecting an examination of their effectiveness in sustaining household welfare. Some reasons for these significant gaps include the lack of consensus on measuring resilience, the rarity of longitudinal data in LMICs, and the challenge of establishing true causality due to endogeneity concerns. Therefore, this study aims to circumvent these challenges to investigate the impact of resilience capacities against health shocks in households affected by NCDs in Nigeria and to determine the effectiveness of the coping strategies they employed to smooth consumption.

Method: This study uses the most recent large-scale cross-sectional household survey in Nigeria, the Nigeria Living Standards Survey (NLSS) (2018-19). The survey employed a two-stage cluster sampling design to cover 22,000 households representative of all states. It collected socio-demographic, economic and health data. To examine resilience, we employed a standardised counterfactual method developed for cross-sectional data by the World Bank. Three groups of households were identified: resilient, non-resilient, and chronically poor. Using the consumption gap as a welfare indicator, we estimated the effectiveness of household coping strategies using ordinary least squares (OLS)with inverse probability weighting to establish true causality and eliminate selection bias, as well as a control function using community effects. These methods addressed endogeneity concerns and helped examine the heterogeneous effects of the coping strategies across different points of the consumption distribution.

Results: The results show that NCD-affected households are more likely to be chronically poor (31% of NCD vs 22% non-NCD), less likely to be resilient (36% of NCD vs 41% non-NCD).

In NCD-affected households, OLS regression shows that most coping strategies were ineffective in reducing the welfare gap. Additional work was only significantly effective for chronically poor households, but harmful for NCD-affected households.

Moreover, formal/informal assistance was counterproductive for chronically poor households with NCDs.

Conclusion: Household coping strategies, in isolation, are not enough to protect welfare during shocks. Effective policy requires systemic interventions: robust safety nets, affordable credit, community support, and targeted programs for the vulnerable. Policymakers should focus on building long-term resilience and addressing the root causes that force households into ineffective or harmful coping behaviours.

Ind-1458 Sick of Becoming a Parent: The Child Penalty on Parents' Mental Ill-Health

PRESENTER: **Erik Grönqvist**, Uppsala University
AUTHORS: Erica Lindahl, Stavros Illiadis, Emma Fransson, Elisavet Illiadi

Having a child is a major life course transition for parents entailing parenting stress, more binding time constraints and changed gender roles. We study how family formation impacts parents' mental health and the role gender norms contribute in shaping gender differences in mental health.

A recent literature documents a child penalty on health-related outcomes. Women increase their use of sickness absence (Angelov, Johansson, and Lindahl 2018; Fontenay and Tojerow 2020; Andresen and Nix 2022), antidepressant drugs (Ahammer et al. 2023) and primary care visits for mental ill-health (Hart et al. 2023) after becoming mothers, and also in comparison to fathers. Thus, parenthood increases the gender gap in health preventive activities.

In this paper we ask how parenthood affects mothers' and fathers' mental health. We focus on inpatient care due to mental ill-health (ICD F-diagnoses). While this is a severe health outcome, it entails a limited scope for health investment behavior (Avdic and Johansson 2017) and may as such better reflect individuals underlying health capital, than, for example, drug prescription and sick leave used in earlier studies. We focus on mental health since we are interested in the impact of entering parenthood and its new duties in terms of parenting stress, more binding time constraints and changed gender roles.

To connect with the earlier literature, we also re-estimate our main results on more behavior-related health measures such as outpatient care, and prescription of drugs. We use the event-study specification proposed by Kleven et al. (2019), and we compare effects on men and women. The analysis is based on Swedish administrative register data on all men and women who become parents in Sweden between 1990 and 2008, and we follow parents 5 years before and 10 years after the birth of the child.

Our first results show a large increase in the risk of inpatient care due to mental ill-health for both parents when becoming a parent. These results suggest that becoming a parent is a life-changing event that impacts not only career trajectories, but also the risk for sever mental health problems both for men and women.

When studying the impact of parenthood on more behavior-related health measures, we find a larger increase in use of prescription drugs among women in comparison to men 4 years after the birth of the first child. In the shorter run, i.e., the first year after childbirth, on the other hand, it is interesting to note that women reduce their use of drugs. We propose that this reduction can be explained by mothers' use of maternity leave and their increased contacts with maternity care and child healthcare services. For fathers, where similar support is less extensive, there is no downward shift.

Ind-2198 Are Children of Child Brides More Likely to be Exposed to Child Labour? Evidence from 10 Countries in West and Central Africa

PRESENTER: **Sopuruchukwu Obiesie**, University of Oxford
AUTHORS: Lucie Cluver, William Edward Rudgard

Introduction The burden of girl-child marriage is shifting to West and Central Africa, where over one in four girls are married before the age of 18. Existing literature has established a causal link between child marriage and negative outcomes, including adverse health impacts, reduced educational attainment, lower lifetime productivity, and diminished agency and empowerment. More recently, attention has turned to its intergenerational effects, with studies highlighting poorer nutritional and developmental outcomes as well as a causal link to lower schooling achievements among children born to child brides. However, there remains an evidence gap regarding whether children of child brides are at higher risk of engaging in child labour. This study aims to investigate the association between maternal child marriage and children's exposure to child labour. Additionally, we explore whether this relationship varies by the gender of the child, the specific form of child labour, and the extent of heterogeneity across countries. **Methodology** We pool data from the 6th round of the Multiple Indicator Cluster Survey (MICS) from 10 countries in West and Central Africa collected between 2017 and 2021. The MICS is a nationally representative household survey carried out by countries with support from UNICEF. Households are selected through a multi-stage cluster sampling design, and questionnaires are administered to members relevant to each survey module. The study population consisted of 63,000 mother-child pairs for children aged 5–17 years and women aged 20–49 years. The dependent variable was child labour, measured as a binary variable using the ILO measurement framework, and the total hours of child work in the preceding week. The independent variable was a binary measure of the mother's experience of child marriage. To inform the progressive realisation of child rights, we also evaluate girl-child marriage as a continuous variable using age at first union. Univariate and multivariate binomial and negative binomial regressions were conducted, with standard errors clustered at the cluster and community levels. **Results** We find that maternal child marriage is consistently associated with increased odds of child labour, particularly in hazardous industries or occupations. These effects are strongest for girls and persist even after adjusting for maternal education and household wealth. Country-specific regressions reveal heterogeneity in our findings, with the strongest associations between maternal child marriage and child labour observed in Nigeria. **Conclusion** Our findings suggest that maternal child marriage is likely associated with a higher risk of next-generation exposure to child labour, especially for daughters and in hazardous occupations and industries. While preventive efforts to end child marriage remain vital, supporting early married mothers in high burden settings can help mitigate the transmission of intergenerational consequences.

Ind-2785 The Role of Absolute and Relative Income Hypotheses on Health: Insights from Religious Subgroup Analysis.

PRESENTER: **Aharon Katz**

Background: The relationship between income and health has been extensively studied, yet the influence of relative income hypothesis

remains inconclusive. This study extends the analysis by examining the impact of relative income within religious subgroups. A measure of relative deprivation is applied for each individual to compare the effects of absolute and relative income on health. **Methods:** An ordered probit fixed-effect model with the Mundlak approach is included as the primary analytical framework. To ensure robustness, parametric and semiparametric panel data models are used to address issues of misspecification and unobservable heterogeneity. The main model is also compared to alternative models that restructure the health outcome variable as a binary indicator of good health. **Results:** The findings consistently demonstrate a significant positive correlation between absolute income and health status across the primary model and robustness checks. The positive relationship remains stable except in one robustness check model. In contrast, relative income exhibits a statistically significant and negative impact on health across all models, suggesting a stronger effect than absolute income. Additionally, heterogeneity in the income-health relationship is observed across religious groups. **Conclusions:** This study underscores the importance of accounting for relative income and religious subgroup differences when analysing the income-health relationship, particularly in societies with pronounced religious affiliations. The negative effect of relative income on health highlights the need for policies that address income disparities within religious subgroups to enhance overall health outcomes. **Keywords:** Absolute Income Hypothesis, Relative Income Hypothesis, Relative Deprivation, Religious Groups.

1:30 PM –3:00 PM MONDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Hibiscus

Health and Economic Impact of Primary Care Policies/Models

MODERATOR: **Susan Olivia**,

Ind-788 The impact of Family Doctor Contracting System on Unmet Healthcare Needs in China

PRESENTER: **Jialong Tan**
AUTHORS: Lingxuan Xu, Jian Wang, Peilong Li, Jingjie Sun, Chen Chen

Unmet healthcare needs are a significant concern in China, possibly due to the underutilization of primary healthcare services. The preference for seeking care at tertiary hospitals among many individuals reflects structural legacies of China's healthcare system evolution, wherein historical underinvestment in community health services and the absence of gatekeeping mechanisms have incentivized bypassing primary care. This misallocation of medical resources not only burdens the capacity of tertiary hospitals but also hinders access to necessary healthcare facilities. In response, the Family Doctor Contracting System (FDCS) was introduced to enhance community health services and reduce unmet healthcare needs. This study empirically analyzes the impact of FDCS on unmet healthcare needs using data from the 2018 National Health Service Survey in Shandong Province, which included 27,447 individuals aged over 18. An entropy balancing method was employed to address self-selection bias. Logistic regression results show that individuals contracted with FDs are associated with 1.6 percentage point lower probability to experience unmet outpatient healthcare needs compared to those who did not participate, though FDCS has no significant impact of FDCS on unmet inpatient needs. Robustness checks using various matching methods confirmed these findings. To further investigated the potential mechanism, we found that FDCS has the greatest impact on accessibility of outpatient services. Signing up with FDs reduced the likelihood of citing inaccessibility as the main reason for unmet outpatient care needs by 43.7 percentage points ($p<0.05$), while the impacts on unacceptability and unavailability was relatively more minor at 0.5 percentage points ($p<0.01$). The findings highlight the effectiveness of FDCS in enhancing the role of primary care and improving access to healthcare. Future policy initiatives should focus on promoting the benefits of FDCS, and encouraging utilization of the FD service while strengthening the community-based primary care facilities by providing adequate infrastructure, resources and training.

Ind-1559 Impact of Primary Care Subsidies on Healthcare Utilisation: Evidence from Singapore's Merdeka Generation Package (MGP)

PRESENTER: **Benjamin Toh**
AUTHORS: Geraldine Lim, Kevin Low, Jeanette Pang

Introduction

With an ageing population and rising chronic disease burden in Singapore, good chronic care management is necessary to improve health outcomes and reduce the need for acute care in the future. One key aspect of chronic care management is regular primary care visits, where frequent screenings and monitoring can facilitate early intervention and reduce the likelihood of related acute complications. To investigate whether financial incentives are effective in increasing primary care utilisation, we examined the causal effects of the Merdeka Generation Package (MGP), which was introduced by the Singapore government in 2019 to support seniors through additional subsidies for outpatient care. By improving the affordability of primary care, MGP is expected to incentivise seniors with chronic diseases to go for more visits and better manage their health conditions. We also examined whether greater primary care utilisation reduced acute utilisation, which would result in cost savings for the healthcare system since acute care is expensive and often heavily subsidised. Overall, our research findings served to inform the effects of financial incentives on chronic care management and provide insights on the potential impact of similar national initiatives that utilised subsidies to encourage primary care utilisation.

Methods

Eligibility for the MGP was strictly based on birth year (i.e., 1950 to 1959) and independent of health state and income level. This exogeneous eligibility condition allowed for a quasi-experimental study by comparing seniors who were born just above and below the 1959 birth year cut-off for the MGP. Specifically, we adopted a difference-in-differences approach to measure the causal effect of providing more primary care subsidies on healthcare expenditure in both the primary and acute care settings over a three-year period. Further heterogeneity analysis was

conducted to examine if the impact on healthcare expenditure had varied based on the size of the subsidy increase.

Results

We found that providing more primary care subsidies resulted in a 3% to 12% increase in primary care expenditure on average. This was driven by increases in the number of visits, and the effect was higher amongst seniors who received larger subsidy increases. Furthermore, we found that the subsidies led to a substitution from public to private primary care providers as the decline in expenditures in the former was offset by an increase in expenditures in the latter. This suggested that the subsidies had improved affordability of private clinics and therefore, allowed more flexibility in patients' choice of providers, as private clinics were generally more expensive but provided greater convenience. Meanwhile, there was no evidence that the increase in primary care utilisation reduced acute utilisation in the inpatient care, day surgery or emergency department settings over the three-year period.

Conclusion

Our study showed that financial subsidies can be an effective tool to increase primary care utilisation and expenditure amongst seniors. However, our study did not find evidence of its downstream impact on acute expenditure in the immediate years, suggesting that future studies should focus on examining the effects of increased primary care expenditure on acute expenditure over the longer term.

abs-os526 Primary Healthcare Investment Case for Jordan

PRESENTER: **Iryna Kurinna**
AUTHORS: Mr. Robert Kolesar, Eduardo Gonzalez Pier

Background: High-performing primary healthcare (PHC) is critical for achieving better health outcomes, improving health system efficiency, promoting equity, and enhancing resilience. Globally, health systems with a strong PHC focus consistently outperform those emphasizing hospital-based care at comparable expenditure levels. However, Jordan's healthcare system faces persistent challenges, including fragmented and poorly harmonized health insurance schemes, overuse of the exemption program, and suboptimal PHC service quality. Only 22.4% of Jordan's health budget is allocated to PHC, significantly below the international benchmark of one-third. The health system remains skewed toward curative care, with limited support for preventive services, health promotion, early detection, and palliative care. Recent analyses by the Jordan Strategy Forum, the World Bank, and the International Monetary Fund underscore the need to prioritize PHC within the country's broader health reform agenda. This study fills a critical gap by generating economic evidence to catalyze policy action and mobilize resources for PHC strengthening in Jordan. **Research aims:** The Jordan PHC Investment Case aims to: 1. Summarize health expenditure trends and develop an investment case framework. 1. Estimate potential system savings and economic benefits of PHC strengthening through improved technical efficiencies, reduced hospital referrals, and enhanced health outcomes. 1. Quantify the PHC financing gap and calculate the return on investment (ROI) of increased PHC spending. 1. Provide actionable recommendations for governance, financing, health workforce development, and other targeted strategies to strengthen PHC. **Methods**: The study employs a mixed quantitative approach based on an extensive literature review, health expenditure analyses, and econometric modelling. Data envelopment analysis (DEA) was used to benchmark technical efficiency, estimate the Malmquist Productivity Index, and construct an efficiency frontier for a reference set of countries. Cost savings related to containing hospital emergency visits and reduction in Ministry of Health (MOH) hospital referrals are estimated based on the operation and cost data from Jordan's MOH. We also apply the Synthetic Control Method (SCM) and assess potential health gains from PHC reforms, monetized using standard values per statistical life year. Finally, we compare PHC expenditure benchmarks with current spending to calculate potential economic returns on investment. **Key Results:** Preliminary results indicate that Jordan's PHC system operates below efficiency benchmarks observed in peer countries, with substantial room for improvement. DEA analysis reveals significant technical inefficiencies, while SCM modelling suggests that reversing historical underinvestment in PHC could lead to measurable health gains. Initial ROI estimates demonstrate that increased PHC investment can yield system-wide savings through reduced hospitalizations and referrals, alongside economic benefits from improved population health outcomes. **Conclusions:** Strengthening PHC in Jordan offers a transformative opportunity to improve health system efficiency, equity, and sustainability. The evidence generated highlights the urgency of reorienting health sector priorities toward PHC and mobilizing domestic and international investments. Policymakers should act on the recommendations provided to close the PHC financing gap and harness the potential health and economic returns of a strengthened PHC system. These findings support Jordan's health reform agenda and provide a replicable model for other middle-income countries aiming to achieve UHC.

Ind-2803 Does the Formation of Interprofessional Primary Care Teams Promote Preventive Cancer Screening? Results of a Stacked DID Analysis

PRESENTER: **Sisira Sarma**, Western University
AUTHORS: Sisira Sarma, Rose Anne Devlin, Steven Habbous, Liisa Jaakkimainen

Background and Aims: Interprofessional team-based primary care approaches have been implemented in many jurisdictions worldwide to deliver comprehensive primary care services on a continuing basis. Canada's most populous province, Ontario, rolled out an interprofessional team approach called the Family Health Team (FHT) in a staggered manner beginning in 2006 within a universal health insurance system, where physicians are remunerated by age- and sex-adjusted capitation method while allied health professionals are salaried. Limited evidence exists on the causal effect of interprofessional team-based care on preventive health care, which our study addresses. Preventive screening for cancer, particularly breast, cervical, and colorectal cancer, is important for early detection and reducing cancer-related morbidity and mortality.

Methods: Utilizing retrospective Ontario health administrative data on physicians and patients from 2005–2023, we analyzed cancer screenings among patients enrolled with an FHT who were eligible for colorectal (N=3,494,098), cervical (N= 4,386,583), and breast (N=1,540,176) cancer screenings. We used a stacked difference-in-differences approach, where we included cohorts of patients enrolled with an FHT physician from 2006 to 2022, along with corresponding control cohorts of patients enrolled with an FHT physician five years later. We used entropy

balancing in the pre-FHT period to address physician selection into FHTs using observable patient and physician factors. Our control group for each stack minimizes unobservable selection into FHT as physicians with strong preferences and a proclivity to practice in teams are included. Patient selection into FHT is not feasible in Ontario as only physicians can decide whether to form a team, subject to availability by the Ontario Ministry of Health. We conducted event-study analyses to tease out the causal effect of FHT on cancer screening over time, adjusting for patient demographics, physician characteristics, and patient-fixed effects. We also investigated the effects across various marginalized populations based on area-level characteristics.

Results: Our preliminary results of aggregate treatment effects revealed that patients enrolled with FHTs experienced an increase in the probability of colon cancer screening of 1.1% ($p<0.05$), cervical cancer screening of 1.9% ($p<0.001$) and breast cancer screening of 1.2% ($p<0.001$). Dynamic effect results of time to treatment indicate that the effect increased after three years of physician practice in teams. For example, colon cancer screening probabilities rose by 0.8% ($p <0.001$) in the first year and by 2% ($p<0.001$) after four years. Stratified analyses revealed that the effects were more pronounced among patients living in economically disadvantaged areas (colon: 1.8%, $p<0.001$; cervical 2%, $p<0.001$; breast: 1.4% $p<0.05$).

Conclusions and Implications for Policy and Practice: We found that the rollout of interprofessional primary care teams within a capitated physician payment system in Ontario, Canada, improved preventive cancer screening rates. Our findings underscore the potential of employing interprofessional team-based care to improve preventive healthcare and mitigate disparities in access to preventive cancer screening. Policymakers may consider these findings as supporting interprofessional team-based primary care to optimize preventive care. Future research could explore other preventive care outcomes in teams using our analytical approach to obtain broader insights into primary health care system efficiency and equity.

Ind-168 Cost Control, Healthcare Provision, and Quality of Care in Chinese Primary Health Care Instutions under Capitation-Based Payment Schemes

PRESENTER: **Yangling Ren**, Southwestern University of Finance and Economics

AUTHORS: Yafei Si, Chi Shen, Zhongliang Zhou, Dan Cao

Health systems worldwide face the dual challenge of containing rising costs while ensuring access to high-quality care, particularly in primary care settings. Capitation-based payment reforms have been proposed as a solution to balance these demands, yet empirical evidence on their impact in low- and middle-income countries remains limited. This study evaluates the effects of a capitation payment pilot, where financial risk is shared between healthcare providers and patients and implemented in western China, on service provision, healthcare cost and care quality. Utilizing a differences-in-differences approach, we find that at the hospital level, the capitation reform led to positive impacts on public health service delivery and outpatient visits. The reform resulted in a significant reduction in monthly drug costs per visit, despite no changes in test cost and total cost per visit. Survey analysis using standardized patients (SPs) further revealed a significant improvement in the process quality such as doctors' adherence to recommended questions and exams and patient centredness, despite no significant changes in providing a correct diagnosis or correct treatment. The SP survey also finds a significant decrease in total cost. These findings underscore the potential of capitation to contain healthcare cost inflations without compromising overall care quality.

1:30 PM –3:00 PM MONDAY [Health Care Financing & Expenditures]

Bali International Convention Centre – Bandung

Financing Family Planning and HIV/AIDS Services

MODERATOR: **Hasbullah Thabrany**, ThinkWell, LLC/USAID Health Financing Activity

Ind-2029 Funding the Fight Against HIV: The Effects of Domestic and International Health Expenditure in Mozambique

PRESENTER: **Eliana Chavarría Pino**, University of Manchester

AUTHORS: Ms. Laura Anselmi, Sergio Chicumbe, Matt Sutton

Mozambique has made significant progress in the fight against HIV, yet it continues to face one of the highest HIV prevalence rates globally. International funding has historically played a dominant role in the HIV response, with funding directed to HIV representing a large proportion of international spending. However, robust evaluations assessing the effects of international spending and different funding arrangements on HIV-related outcomes, particularly prevalence, remain limited. This study evaluates the effect of international health expenditure on adult and children HIV prevalence and HIV-related knowledge in Mozambique. We constructed a novel dataset at the individual level covering 2008-2015 and including (i) HIV prevalence (from test results) and HIV knowledge from the Demographic Health Surveys (2009, 2011, 2015), and (ii) International health expenditure through earmarked projects or a common health fund. We used district intercepts and controlled for time-varying district characteristics, household and individual characteristics. We assessed the interactions between international health expenditure and government health expenditure. We implemented a shift-share instrumental variable approach to account for potential endogeneity of expenditure. Overall international funding through earmarked projects decreases HIV prevalence and increases knowledge of transmission channels during pregnancy, delivery, and breastfeeding. A 1% increase in overall international funding reduces the probability of a positive HIV result by 0.024 pp, and increases the probability of knowing about transmission channels by 0.031 pp. If international budget support increases by 1%, the probability of knowing about transmission channels increases by 0.174 percentage points (pp). Examined separately, the different sources and types of expenditure did not have a significant association with being offered an HIV test and being tested as part of an antenatal care visit. However, there is a positive effect of the interaction between government health expenditure and HIV-specific international expenditure on being tested as part of an antenatal care visit. Our findings indicate that international budget support and international funding through earmarked projects positively influence HIV-related outcomes. International funding reduces HIV prevalence and

increases the knowledge about transmission channels. Government health expenditure complements HIV-specific international funding for increased testing during antenatal care visits. In this context, declining trends in international funding are challenging and might lead to higher pressures on domestic resources and local health systems to equip and absorb the HIV response. Future analyses will focus on alternative empirical strategies to address self-selection bias for HIV testing.

Ind-584 Financing the Integration of Private Providers in Mixed Health Systems: Evidence from a Family Planning Initiative in Rural Philippines

PRESENTER: **Pura Angela Co**

AUTHORS: Megan Rauscher, Sarah Straubinger, Geminn Louis Apostol

Background: Despite the Philippines' national health insurance scheme (PhilHealth) and 2019 Universal Health Care (UHC) law providing incentives for private provider participation, complex reimbursement mechanisms and unclear financial flows limit private sector engagement (PSE) in family planning (FP) service delivery under the scheme. While 65% of private health providers are PhilHealth-accredited, the public sector remains the primary FP service provider, particularly in rural areas. Between 2021 and 2023, we implemented and captured learning from interventions that address critical financing and integration gaps by examining how strategic purchasing can support expanding FP access through private providers. **Aim:** Implementation learning include: (1) feasibility of implementing a novel public-private financing model for FP services in two rural provinces through evaluating changes in private facility accreditation and service readiness, measuring provider participation and capacity development, and analyzing financial flows and payment mechanisms; (2) examination of the model's preliminary effectiveness by measuring access to FP services, particularly long-acting reversible contraception (LARCs), out-of-pocket (OOP) expenditure reduction, and provider satisfaction with payment systems; and (3) documentation of implementation lessons to inform policy recommendations for scaling PSE in the Philippines' UHC framework. **Methods:** We employed an implementation learning approach incorporating human-centered design principles in two rural provinces (Antique and Guimaras) from 2021-2023. The approach followed iterative cycles including: (1) initial rapid assessment through key informant interviews to evaluate public-private sector readiness; (2) multi-stakeholder co-design workshops to develop a Public-Private-PhilHealth Partnership framework, resulting in formalized Memorandums of Agreement establishing payment mechanisms and operational protocols; (3) formation of provider Communities of Practice to address implementation barriers collectively; and (4) participatory monitoring through mixed methods including service delivery statistics, financial flow analysis, and structured feedback sessions. The Integrated Midwives Association of the Philippines served as an intermediary partner. **Results:** From October 2021 to November 2023, PhilHealth-accredited private facilities increased from 1 to 6 in Antique and 0 to 6 in Guimaras. Provider capacity expanded significantly, with FP-certified providers increasing from 2 to 27 across both provinces, specifically trained in contraceptive implant and IUD insertion procedures. Service delivery data showed 1,126 clients received LARCs (IUDs and implants) through newly accredited private providers. The payment mechanism eliminated OOP costs for clients while ensuring predictable monthly reimbursements for providers. Initial provider feedback indicates improved confidence in the public purchasing system. The Department of Health's adoption of project implementation guidelines into their PSE policy framework suggests potential for broader system-level impact. **Conclusions:** Despite the limited implementation period, results suggest that strategic purchasing approaches combining clear payment mechanisms and standardized processes can effectively integrate private providers into public health systems while expanding access to FP. While preliminary findings suggest strong potential for replication—now being tested through adaptation in Kenya—longer-term impact data will be valuable. Key policy recommendations center on three critical elements: predictable payment systems, efficient claims processing, and transparent public-private resource-sharing frameworks. This implementation experience advances the evidence base for financing mechanisms that support effective PSE within mixed health systems, especially for low- and middle-income settings advancing UHC goals.

Ind-1864 Integrating Sexual and Reproductive Health (SRH) in Comprehensive Outpatient Care Coverage in LMICs: Early Learnings from the Philippines

PRESENTER: **Bernardo II Cielo**

AUTHORS: Pura Angela Co, Vergil de Claro, Grace Viola, Blanca Louise Rellosa

In 2019, the Philippines adopted RA No. 11223, also known as the Universal Health Care (UHC) Act, mandating universal health coverage to all Filipinos, including the provision of a comprehensive outpatient benefit package. The comprehensive outpatient care coverage was envisioned to integrate primary and specialist outpatient care services, shifting away from the previously siloed, programmatic approaches employed in the Country. However, balancing program-specific targets with streamlined incentives that align with local clinical practice and consumption behaviors remains a significant challenge. This is particularly relevant for sexual and reproductive health (SRH) where service coverage intersects with other healthcare benefits such as primary care, trauma management in emergency settings, and outpatient drug coverage. This study aimed to provide actionable insights into integrating SRH into comprehensive outpatient care by examining the provision of SRH services across different types of providers, identifying service and cost coverage needs and informing the design of social health insurance benefits under the current framework. The study utilized a sequential mixed methods approach, guided by a composite framework combining the WHO 3-D Prioritization and the WHO Strategic Purchasing Framework. The Delphi method was used to prioritize SRH services for coverage, which informed provider mapping and micro costing analyses. The study used program data, collected with the support of the Philippine Health Insurance Corporation (PhilHealth) and the Department of Health (DOH), and primary data collected in accordance with local research ethics standards. Early evidence indicates that integrating SRH into outpatient care coverage has the potential to diversify services and enhance sustainability of outpatient care facilities. Our findings suggests that social insurance coverage can uniquely incentivize the expansion of health services, showing notable supply growth among private sector providers. However, containing health care costs require investment in public healthcare delivery, as prices in private facilities tend to be higher on average. The study highlights the importance of maintaining program-level goals, ensuring that SRH financing contributes to measurable improvements in health outcomes. Failure to factor in SRH within comprehensive outpatient coverage risks diluting its prioritization, undermining efforts to integrate it effectively. These findings offer valuable lessons for LMICs navigating mixed health systems and advancing UHC objectives.

Ind-2520 Does Early Childhood Development Need to be Integrated into the National Public Health Service Programs in China?

PRESENTER: **Han Runzhi**
AUTHORS: Yaqun Fu, Zhao Jingyu, Li Yang

Background: In China, the National Public Health Service Programs (NPHSP) provides free healthcare services for children aged 0-6; however, regional disparities in access and quality persist. Well-developed regions achieve better health outcomes with higher-quality services and a higher population coverage, compared to less-developed areas. To address this, a four-year Early Childhood Development (ECD) pilot project was launched in 2017 to create a scalable model for children aged 0-3 in underdeveloped regions. While ECD has proven effective with high returns on investment internationally, regional cost variations and the lack of standardized pricing highlight the need for comprehensive cost assessments to guide policies and funding decisions to increase the sustainability.

Objectives: This study aims to comprehensively evaluate the implementation costs of the ECD pilot project in rural China, identify cost components and their variations, explore the feasibility of integrating ECD into the NBPHSP, and provide evidence for scaling up ECD programs and ensuring financial sustainability at the national level.

Methods: This study analyzed data from ECD pilot project conducted in 14 counties/districts in China. A multi-stage sampling design was used to select five pilot counties and corresponding control areas. The cost analysis covered seven categories, including training, supervision, and service delivery. Data were collected through field visits, questionnaires, and institutional records. The study also simulated annual per capita funding requirements under different implementation scenarios to provide insights into financial sustainability.

Results: From 2017 to 2020, the weighted average total cost of the ECD project across five pilot counties was US$ 84,493 over four years. Training accounted for 46% of costs, followed by service delivery (15%), daily operations (13%), and supervision (10%). Funding sources included project-specific funds (69.8%) and matching contributions from national (12.3%), county (11.4%), and provincial (6.5%) governments. The annual per capita costs for 2 or 4 home visits were US$ 20.7–28.2 and US$ 21.5–28.9, respectively. Integrating ECD into the NBPHSP would reduce additional per capita funding to US$ 0.70–0.99 for 2 visits and US$ 0.71–1.05 for 4 visits, saving US$ 19.71–27.50 and US$ 20.45–28.19 per capita annually, enhancing financial sustainability and service accessibility.

The ECD program significantly improved early childhood development. Compared to control areas, intervention areas showed higher rates of households with children aged 0-3 owning at least three books (70.7% vs. 48.1%), at least two toys (76.7% vs. 62.3%), and supporting early learning (94.2% vs. 91.0%). Violent discipline was also lower in intervention areas (45.3% vs. 51.1%), with all effects remaining significant after adjusting for baseline levels.

Conclusions: The findings underscore the cost-effectiveness and feasibility of the ECD in reducing risk factors detrimental to child health and fostering positive developmental outcomes. Integrating ECD into the NBPHSP not only enhances financial sustainability and service accessibility but also demonstrates significant improvements in early childhood learning environments and parenting practices. Scaling up ECD programs in rural China is both economically viable and crucial for bridging regional disparities and advancing early childhood development.

Keywords: early childhood development, cost analysis, health financing, public health services

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1:30 PM –3:00 PM MONDAY [Evaluation Of Policy, Programs And Health System Performance]

os107 Bali International Convention Centre – Denpasar A

Applications of Novel Econometric Methods for Evaluating Effects of Exposure to Harmful Events

MODERATOR: **Anirban Basu**, The CHOICE Institute, University of Washington, Seattle

CONVENER: **Partha Deb**, Hunter College

DISCUSSANT: **Stephen O'Neill**, London School of Hygiene and Tropical Medicine; **Stéphane Verguet**, Harvard University

abs-os688 Does Physician Racial Bias Affect Disparities in Emergency Medicine?

PRESENTER: **Mr. Jeffrey McCullough**
AUTHOR: Anjelica Gangaram

Patients depend on physician agents for medical decisions. Physicians will, ideally, be informed and representative agents leading to effective and equitable care. US healthcare, however, continues to exhibit significant disparities in outcomes based on patient race and gender. Given the limited diversity of the US healthcare workforce and clinical trial participants, physician bias may contribute to these disparities. Bias among individual physicians might arise from sources ranging from racial animus to imperfect medical education. Allocative biases might also arise from differences in physician skill or practice patterns. Measuring the impact of physician bias is challenging, particularly since patient race and gender may be correlated with unobserved factors like severity and patient preferences. We employ a novel framework to measure racial bias in physicians' diagnostic decision-making. We exploit the quasi-random assignment of physicians in emergency medicine to measure marginal positivity rates across white and Black patients of the same physician. The same identification strategy is used to recover distributions in physicians' skills and practice patterns across white and Black populations.

Our approach produces unbiased point estimates of each physician's discriminatory behavior. These physician-specific estimates are, however, measured with error. Consequently, the more policy relevant distribution of discrimination is overdispersed and does not reflect the discrimination faced by black patients in Michigan's emergency medicine market. We will employ empirical Bayes (e.g., Kline, Rose, and Walters, 2022) to address this problem. We will recover the mixing distribution by deconvolving the physician-specific parameters and their standard errors. Using the mixing distribution as a prior, we will update it with the physician-specific parameters to form the corrected posterior.

This approach is applied to diagnostic imaging decisions for emergency patients with a chief complaint of abdominal pain. A missed diagnosis of severe abdominal disease typically results in major morbidity or even mortality. We use electronic health record data from a near census of Michigan emergency departments. Our findings reveal that Black patients receive imaging at rates 11 percentage points lower than white patients, despite having a similar incidence of severe disease. We find nearly identical marginal positivity rates across Black and white patients among physicians. Physicians are, in effect, applying the same clinical standard when diagnosing Black and white patients. We also find evidence of allocative equity: redistributing Black and white patients among physicians would only reduce the diagnostic disparity by approximately 0.2 percentage points. Additionally, disparities are not driven by insurance coverage differences or patient preferences, as imaging refusal rates are very low and nearly identical across races. Rather, our findings suggest that severe abdominal diseases that require computed tomography scans are somewhat easier to diagnose among Black patients.

abs-os685 The Effects of Terrorism on Health and Human Capital: Evidence From India

PRESENTER: **Anna Vera**
AUTHOR: Partha Deb

Terrorism and violent attacks have increased unrelentingly across the globe in recent decades. These events cause fatalities, destroy infrastructure, and create an environment of fear, which can have consequences on health and human capital outcomes of people living in those communities. Even outside long-term conflict regions within countries, many people face terrorist events, and live with the consequences of such events. We study whether exposure to terrorist incidents contributes to worse health-related behaviors, health, education and labor market outcomes among adults in India.

We use data from the Global Terrorism Database (GTD) to obtain the dates, types and severity terrorism events. The analysis includes terrorism events classified as armed assaults or bombings with at least one fatality. We restrict the sample to terrorism events that have occurred in mainland India since the year 2000. Events in the state of Jammu and Kashmir are excluded, as the ongoing conflict in the region is beyond the scope of this analysis.

Exposure to a terrorism event is measured as the time since the first armed assault or bombing in a district. There was an armed assault event in 200 districts and bombing event in 162 districts of 612 districts considered in my analysis. 120 districts had both an armed assault and a bombing. Of those districts that had both types of terrorist events, the armed assault happened first in 51 districts (42.5%), the bombing happened first in 67 districts (55.8%), and both kinds of events first occurred in the same month in the remaining 2 districts (1.7%).

We merge information on these terrorism events to microdata from India’s National Family Health Surveys (NFHS) 4 and 5, collected in 2015-16 and 2019-21. These multipurpose surveys provide survey data on men’s and women’s health-related behaviors, health, education and labor market outcomes. Critically, the survey data reports how long respondents have lived in their current place of residence. In our primary analysis, we restrict our sample to those who have lived in their current residence for at least 20 years, longer than the oldest terrorist event we consider. This leaves us with samples of 143,448 men, of whom 60,957 (42.5%) were exposed to a terrorist event in their district, and 462,712 women, of whom 201,533 (43.6%) were exposed in their district.

We adapt existing staggered difference-in-differences in two dimensions to estimate the average treatment effects on the treated (ATET) in aggregate and across exposure time and space. First, unlike many repeated cross-section datasets in which surveys are available each year for a number of years, the NFHS data has survey measurements in 2014, 2015, 2019, 2020 and 2021 from which we infer exposure time. Second, we allow for differences between armed assaults and bombings, which requires adaptation to two-types of events modeled jointly. Preliminary findings suggest that both armed assaults and bombing events have deleterious effects on health and human capital formation. The cumulative effect of exposure to both types of events appears to be greater than the sum of the parts-effects.

abs-os680 Using Bunching at Zero to Estimate the Causal Effect of Alcohol Usage on Long-Run Health Outcomes

PRESENTER: **Mr. Joe Spearing**
AUTHOR: Debora Mazetto

Over 60% of Americans regularly consume alcohol. While heavy consumption of alcohol over a long period of time is linked to health problems, less is known about the effects of moderate alcohol consumption.

Estimating the effect of moderate alcohol consumption over the long-run is plagued with identification problems: because alcohol consumption is a choice, it is correlated with confounders, many of which are unobservable. Observational studies have derived a “j-curve” in alcohol consumption’s association with heart health, where increases in consumption are associated with improved heart health at low levels of consumption, but associated with worse heart health at higher levels of consumption (Corrao et al. 2000, Mukamal et al. 2006, Goel et al. 2018, Bryazka et al. 2022, Ronksley et al. 2011). However, they typically cannot establish whether this effect is due to the protective effects of moderate alcohol consumption or whether there are unobservable confounders which explain why moderate drinkers are healthier.

Economists have sought to circumvent this problem by using exogenous variation due to taxes or prices, or instrumenting alcohol consumption

with genetic information. While these approaches can be illuminating, they have the drawbacks of relying on strong exclusion restrictions or identifying only short-run effects of alcohol consumption.

We advance this literature by adapting a novel econometric approach to identifying the causal effect of censored continuous variables (Caetano, Caetano and Neilsen 2023). We exploit the fact that alcohol consumption bunches at zero- intuitively this bunching implies that non-drinkers may be discontinuously different to people who drink very small quantities. Under the assumption that the treatment effect of alcohol consumption is continuous, any discontinuity in the dependent variable at zero therefore reflects the behaviour of confounders (Caetano, 2015). Given as assumed distribution of confounders, the scale of this discontinuity therefore tells us the sign and magnitude of confounders. We therefore map assumptions about the distribution of confounders amongst non-drinkers onto the causal effect of long-term moderate alcohol consumption on health outcomes. In effect, our results allow us to control for unobserved, as well as observed, confounders.

1:30 PM –3:00 PM MONDAY [Health Care Financing & Expenditures]

os132 Bali International Convention Centre – Medan

The Persistence of Financial Hardship: Global Evidence of the Causes and Consequences

MODERATOR: **Karen Grépin**, University of Hong Kong

abs-os780 HONORABLE MENTION FOR ADAM WAGSTAFF AWARD: Coping (More or Less) with Health Shocks: a Longitudinal Perspective on Financial Protection from Nepal

PRESENTER: **Vishnu Prasad Sapkota**

AUTHOR: Owen O'donnell

Catastrophic and impoverishing health spending – two indicators of financial protection used to monitor Universal Health Coverage – are usually estimated from cross-sectional data. Using a three-year (2016-2018) panel of households in non-metropolitan Nepal, we add to scant evidence on the dynamics of these indicators and test whether non-medical consumption falls when the indicators rise in response to health shocks. We find that catastrophic and impoverishing health spending are mostly transitory: at least 80% of the episodes in one year do not continue into the next. A health shock is estimated to raise the likelihood of catastrophic and impoverishing health spending by 36.7 and 7.5 percentage points, respectively. Income falls by an estimated 11.7% if the shock is to a working head of household. Despite these effects, non-medical consumption does not fall. Consumption is smoothed mainly through use of savings and other coping that need not overly compromise long-run consumption potential. While this is somewhat reassuring given catastrophic health spending is mostly transitory, a sizeable minority (20%) has recurrent catastrophic spending, some households rely on more pernicious coping strategies, and others make no recourse to coping, in which case, a health shock is estimated to reduce non-medical consumption by 14.3%.

abs-os777 Measuring Persistence and Duration in Out-of-Pocket Health Expenditures

PRESENTER: **Pedro Rosa-Dias**

AUTHORS: Rocio Garcia-Diaz, Karen Grépin, Aaron Salinas

As a population ages, there is a notable rise in the prevalence of chronic diseases and multimorbidity leading to high financial stress attributed to persistent high out-of-pocket health expenditures (OOPHE). Extended periods of financial stress resulting from OOPHE undermine households' ability to attain financial risk protection. This protection is defined as the capacity to access essential and quality healthcare services without enduring undue financial hardship. Many studies that examine prolonged periods typically concentrate on a specific health shock or illness episode to assess the impact on the composition of household expenditures and coping strategies. However, in cases where panel data spans a considerable duration, isolating a single health shock becomes challenging and oversights valuable information regarding households consistently reporting high OOPHE without necessarily reporting distinct health shocks.

We measure the intertemporal impact of catastrophic OOPHE and analyse how households experience prolonged financial stress due to OOPHE. Drawing inspiration from the duration spell analysis in poverty research, we formulate an intertemporal catastrophic measure. This measure considers the duration of spells, reflecting the number of consecutive periods during which a household experiences financial stress, and incorporates diverse household perceptions of these spells. This captures concerns related to sustained and consecutive periods of financial stress over intermittent ones, that offer the possibility of potential for recovery. Additionally, we propose an empirical estimation strategy, based on survival models, to evaluate the probability risk ratios of the duration spells of households.

abs-os779 Persistent Catastrophic Expenditures and Chronic Illness in Older Populations

PRESENTER: **Rocio Garcia-Diaz**

AUTHORS: Pedro Rosa Dias, Aaron Salinas

Background:

Chronic non-communicable diseases (CNCDs), such as hypertension, cardiovascular diseases, and diabetes, impose a significant burden of disability, especially among elderly populations. These conditions often require prolonged treatment and can lead to high healthcare when financial protection is limited. By 2050, the global population aged 60 and over is projected to reach 22% or nearly 2 billion people. While developed countries currently have a larger proportion of elderly individuals, the fastest aging is occurring in newly industrialized and developing countries, which are expected to house 80% of the elderly population by 2050. Despite this, the persistence of healthcare expenditures associated with CNCDs over time remains poorly understood. Current research often relies on cross-sectional metrics, which provide one-time snapshots of catastrophic health spending but fail to capture long-term patterns.

Methods:

To evaluate the persistence of catastrophic health payments in elderly households with chronic illnesses in Mexico. We compare cross-sectional measures of catastrophic health expenditure (CHE) with metrics derived from panel data to capture persistence over time. Using SAGE-Mexico longitudinal study with three measurement cycles completed to date, Wave 0 (2002-2003), Wave 1 (2009-2010), Wave 2 (2014), and Wave 3(2017), we identify households at risk of (i), long-term persistent CHE, (ii) transient persistent CHE, (iii) chronic CHE, and (iv) no incidence of CHE. The analysis proceeds in two stages. In the first stage, we identify households with persistent CHE and categorize them by the number of chronic illnesses and comorbidities. These estimates are compared to traditional annual, cross-sectional CHE measures. In the second stage, we analyze the determinants of persistent CHE using a fixed-effects model, accounting for individual characteristics. The model is further adjusted for endogeneity, panel attrition, and individual heterogeneity, with longitudinal weights applied to address sample attrition.

Results:

Annual CHE incidence in the panel ranges from 28% to 34%. Persistent CHE is notably high (40%) among elderly households with more than two chronic illnesses, whereas the absence of comorbidities is linked to transient CHE. Key factors associated with persistent CHE include elderly members with comorbidities, higher per-capita expenditure, and pension status. Conditions such as asthma, stroke, and being overweight are strongly associated with persistent CHE while having insurance increases the likelihood of transient CHE.

Conclusions:

The elderly population faces significant financial shocks due to chronic health conditions, especially in the presence of comorbidities, highlighting the need for targeted interventions to reduce CHE. Mandatory health insurance programs specifically for the elderly could mitigate these financial risks. Additionally, exemption schemes for vulnerable elderly populations should be implemented to provide access to healthcare without the burden of catastrophic costs. Optimizing social health insurance programs to prioritize coverage for chronic illnesses can further reduce CHE and address inequalities in healthcare access among the elderly.

Keywords: Elderly, Catastrophic health expenditure, persistent health expenditures, panel data, Fixed-Effects

abs-os781 The Determinants of High and Persistently High Health Expenditures in a Low-Income Country: Evidence from Burkina Faso

PRESENTER: **Karen Grépin**, The University of Hong Kong
AUTHOR: Bingqing Guo

The extent to which households face high health expenditures can influence the design of public policies to protect households against catastrophic and impoverishing health expenditures as well as to promote equitable access to health services. While studies have investigated levels and determinants of health expenditures in other international contexts, few studies have explored the distribution and the dynamics of health expenditures in a low-income country setting. Using panel data collected in Burkina Faso in 2014, this study analyzes the distribution and dynamics of health expenditures in a nationally representative sample of households. We find that health expenditures are highly skewed: 1% of households account for 20% of aggregate health expenditures while the top 5% of households account for nearly half. Expenditures on modern medicines represent the most important category of health expenditures. Overall spending on health expenditures is positively associated with socio-economic status but there is variation in the gradient with measures of catastrophic and impoverishing health expenditures. We find that inpatient health expenditures and chronic conditions, in particular diabetes, are significant predictors of high and persistently high health expenditures. Policy makers in Burkina Faso who currently exploring options to expand pre-paid insurance programs to achieve Universal Health Coverage should consider expanding coverage for inpatient health services and provide greater coverage for non-communicable diseases.

1:30 PM –3:00 PM MONDAY [Health Care Financing & Expenditures]

os134 Bali International Convention Centre – Karangasem

Deliver Quality, Efficient, and Equitable Healthcare by Harnessing Costing Systems

MODERATOR: **Abha Mehndiratta**, Center for Global Development

CONVENER: **Abha Mehndiratta**,

DISCUSSANT: **Lorna Guinness**, Center for Global Development, London, UK; **Rodrigo Munoz**, Inter-American Development Bank; **Ghayas Uddin Ahmed**, National Health Authority, Government of India

abs-os597 Costing Oncology Interventions: Implications for Enhancing India's National Health Insurance

PRESENTER: **Tabassum Wadasadawala**, Advanced Centre for Treatment Research and Education in Cancer

This study addresses the critical need for a robust, context-specific costing framework to support the review of health benefits packages (HBPs) under India’s national health insurance scheme, PM-JAY. Costing is a cornerstone for improving healthcare coverage, quality, and efficiency, providing essential data for informed decision-making in rate-setting and resource allocation. Costing helps address key questions in

the HBP review process, such as the affordability of expanding population coverage or including new services, the appropriateness of reimbursement rates, and whether the rates incentivize quality care and financial protection for patients. Efficient delivery of services in line with clinical best practices and their cost-effectiveness are also critical considerations.

This study focuses on developing and testing a tailored costing methodology, using breast cancer interventions as a case study to demonstrate its feasibility and impact within the Indian healthcare context. The study demonstrates the potential of combining normative (ideal) and empirical (actual) costing methods to inform policy decisions. It highlights the use of clinical guidelines and electronic medical records (EMR) to develop resource baskets for breast cancer pathways, including mastectomy, breast-conserving surgery, and associated therapies. Normative costing benchmarks are contrasted with current practices to identify gaps in quality, coverage, and affordability.

Preliminary findings demonstrate the utility of the costing tool in estimating treatment cost, generating scenarios for funding decisions, assessing trade-offs in HBP updates, and identifying inefficiencies. This approach highlights the importance of normative costing to understand quality gaps and estimation of cost to close the budget gap, aligning with PM-JAY's strategic goals of equity, efficiency, and quality healthcare provisioning.

The next steps include validating the tool across multiple sites, exploring its broader applications, and developing a standardized costing approach that accounts for patient-specific characteristics. Also, leveraging the role of digital health systems like the Ayushman Bharat Digital Mission (ABDM) in facilitating automated data collection as a means to improve the accuracy and reliability of cost analyses and updating and standardization of cost databases.

abs-os610 Essential Building Blocks for Establishing Costing Systems in LMICs: Insights from India

PRESENTER: **Manju Sengar**

The robustness of costing systems for universal health coverage (UHC) is critical to ensure the effective allocation of resources, accurate financial planning, and the delivery of equitable healthcare services. However, for costing systems to be truly effective and reliable under UHC frameworks, they must be built upon a foundation of strong information systems, standardized coding, and well-structured methodologies. These building blocks ensure that data is accurate, consistent, and usable across diverse healthcare settings, thus enabling health systems to better meet the needs of their populations. In this session, we will explore the key components required for building robust costing systems for UHC, with a particular focus on the technical and practical aspects of implementing standardized coding, IT systems, and costing methodologies. We will examine the challenges and best practices for establishing these systems in diverse settings, and discuss in depth experiences and lessons from India.

Building a robust costing system requires the development of reliable IT systems that can store, process, and analyse health cost data efficiently. These systems need to be scalable, secure, and able to handle large volumes of data, which are common in health systems, especially in low- and middle-income countries (LMICs) where health service utilization may be high. The IT infrastructure must be designed to facilitate real-time data entry, ensure interoperability across different health system components, and support decision-making processes related to budgeting, policy development, and resource allocation. At the core of a robust costing system is the integration of standardized coding systems, such as the International Classification of Diseases (ICD-10) codes, which provide a common language for classifying diagnoses and health conditions. This standardization is essential for ensuring that health data is comparable and consistent across different institutions, regions, and countries, thereby enabling a more accurate assessment of healthcare costs. In addition to diagnostic codes, procedure codes are also integral to costing systems, as they enable the classification of medical interventions and services provided. These codes are critical for capturing the full scope of healthcare services and their associated costs, supporting more granular and accurate costing analyses.

Standardized costing manuals and methodologies are another critical component of an effective costing system. These manuals provide guidelines for consistently capturing and calculating costs associated with various health services and interventions. They outline the processes for allocating both direct and indirect costs, and how to account for the complex factors that contribute to the cost of healthcare, such as labor, equipment, pharmaceuticals, and overhead costs. These standardized methods ensure that costing is not only accurate but also comparable across different providers, regions, and health programs.

Additionally, cost data systems must be integrated with broader health financing frameworks and policy-making processes. This requires close coordination between various stakeholders, including health ministries, insurance bodies, hospitals, and healthcare providers. Successful integration of costing data into decision-making processes allows policymakers to use the information for setting fair and equitable health benefit packages, pricing health services appropriately, and optimizing the allocation of resources to improve health system performance.

abs-os584 National Cancer Grid: Transforming Cancer Care in India Through Costing Systems and Affordable Solutions

PRESENTER: **C S Pramesh**

The National Cancer Grid (NCG) is a pioneering initiative dedicated to standardizing and improving the quality, affordability, and accessibility of cancer care across India. As a network of 340 cancer centres, research institutes, and patient advocacy groups, the NCG has developed resource-stratified cancer treatment guidelines tailored to the needs of India's health system. These guidelines are aligned with the health benefits packages (HBPs) of PM-JAY, India's national health insurance scheme, and are informed by cost-effectiveness evidence and feasibility assessments. By integrating adaptive health technology assessment, the NCG ensures that HBPs are rationalized to deliver evidence-based, value-driven cancer care.

A cornerstone of the NCG's approach is its development of oncology-specific electronic medical record (EMR) systems. These systems standardize the collection of data on resource utilization, costs, and charges, enabling accurate cost estimation for cancer care delivery. They

also establish sustainable mechanisms for cost accounting, identify opportunities to improve technical efficiency, and provide robust data for economic evaluations. By leveraging these insights, the NCG optimizes resource allocation and enhances the financial sustainability of cancer services under PM-JAY.

The NCG has also addressed the critical challenges of affordability and equitable access to cancer medicines by implementing pooled procurement practices. In a pilot involving 23 centres, pooled demand for 40 high-value oncology and supportive care drugs totalled INR 15.6 billion (USD 197 million) at maximum retail prices. This process, underpinned by comprehensive technical and financial evaluations, resulted in cost savings of INR 13.2 billion (USD 166.7 million), with discounts ranging from 23% to 99% (median: 82%). Notably, savings were greater for generic medicines compared to patented drugs, demonstrating the potential of pooled procurement to reduce out-of-pocket expenditures and improve treatment outcomes.

This session will highlight the NCG's strategic efforts to rationalize HBPs, streamline procurement processes, and deliver cost-effective cancer care. It will also examine how these initiatives, underpinned by cost data, adaptive health technology assessments, and innovative procurement models, can be adapted and implemented in other low- and middle-income countries to address similar challenges in cancer care delivery.

1:30 PM –3:00 PM MONDAY [Health, Its Valuation, Distribution And Economic Consequences]

os159 Bali International Convention Centre – Orchid

Measuring and Valuing Health-Related Quality of Life in Children and Young People: Evidence to Support Policy and Decisions.

MODERATOR: **Stavros Petrou**, Nuffield Department of Primary Care Health Sciences, University of Oxford

CONVENER: **Martin Howell**, University of Sydney

abs-os277 Are Best-Worst Scaling (BWS) Surveys and Discrete Choice Experiments (DCEs) Feasible in Children and Young People? A Think Aloud Study

PRESENTER: **Marcus Sellars**

AUTHORS: Martin Howell, Pam Wong, Joanna Coast, Kirsten Howard, Rakhee Raghunandan, Anna Denejkina, Emily Lancsar, Elisabeth Huynh

Objectives: To determine the ages at which it seems to be feasible for children and young people (CYP) to complete (i) BWS and (ii) DCE tasks, and to explore any issues associated with completion of each type of task. **Methods:** A qualitative research study using a think-aloud design followed by semi-structured interview was planned with CYP aged between 8 and 12. Recruitment was conducted sequentially, with CYP aged 11 and 12 interviewed first, and then dropping down in age until CYP were no longer able to complete. Participants were asked to 'think aloud' when completing the 4 BWS task comprising of statements of the PedsQL instrument and 4 DCE tasks comprising a choice between two scenarios described by items of the of the PedsQL instrument. The order of the BWS and DCE varied to explore whether this influenced feasibility. Interviews were transcribed and examined for errors (comprehension, judgement and response) or struggle by three raters (MS, EH, JC). Qualitative data were collected to explore reasons for errors in completing the measures and participants' views about the measures. **Results:** The task became very difficult with 9 year olds and so the judgement was made to stop recruitment with that age group. The 40 participants included 14 (35%) 9-year-olds, 11 (27.5%) 10-year-olds, 9 (22.5%) 11-year-olds, and 6 (15%) 12-year-olds, with a roughly even split between sexes. Most CYP were reported to be in very good or good health (97.5%); 20% were reported to have a disability. Overall, participants encountered more errors or struggles during the four DCE tasks, with a median of 14/40 participants making an error and 3/40 experiencing a struggle on each task. In contrast, during the four BWS tasks, a median of 4/40 participants made an error and approximately 2.5/40 experienced a struggle on each task. Across age groups, DCE tasks were consistently more challenging than BWS tasks. No clear trend showed older age groups making fewer errors or struggling less than younger ones on either task, indicating variability. However, the qualitative experience of a struggle appeared more difficult among younger participants, challenging engagement. Interestingly, participants who completed the BWS tasks first tended to perform better on subsequent DCE tasks, and those starting with DCE tasks showed improved performance on later BWS tasks. Comprehension errors were most clearly related to the DCE/BWS nature of the task, whereas judgement and response errors were more commonly related to misinterpretation of items on the PedsQL. **Conclusions:** Both DCE and BWS tasks were feasible for most CYP in the study, though DCEs had more errors and struggles, indicating greater difficulty. Errors varied by age, with younger participants appearing to find struggles more difficult compared to older participants, impacting engagement. Misinterpretation of items within task type suggests a need for further study examining feasibility of the PedsQL in CYP.

abs-os280 Australian Scoring Algorithms for the Pediatric Quality of Life Inventory Generic Core Scales: Best-Worst Scaling and Discrete Choice Experiment

PRESENTER: **Elisabeth Huynh**, Australian National University

AUTHORS: Marcus Sellars, Joanna Coast, Mr. Stavros Petrou, Martin Howell, John Buckell, Kirsten Howard, Emily Lancsar, Rakhee Raghunandan, Jo Wray

Background: The Pediatric Quality of Life Inventory™ Generic Core Scales (PedsQL™ GCS) are some of the most widely used non-preference based instruments for measuring health related quality of life in children. The aim of this study is to derive preference-based scoring algorithms for the PedsQL™ GCS in Australia, for the scales covering four age groups from 2-18 years old. These algorithms are intended to

provide values for use in estimating quality-adjusted life years (QALYs) in economic evaluations of healthcare interventions targeted at children and young people (CYP). Methods: Two stated preference surveys were conducted across the four age modules. Survey one used best-worst scaling (BWS) to elicit values for the full set of 21-23 items of the PedsQL™ GCS instrument. Survey two used a discrete choice experiment (DCE) to value a reduced item set, with a single item for each of the four sub-scales (physical, emotional, social and school functioning) of the PedsQL™ GCS . The surveys were distributed across eight demographic groups each of 500, reflecting the age groups for the PedsQL™ GCS modules and to capture different perspectives (parent proxy, CYP and general adult): two parent samples to value toddlers (age 2-4 module) and young children (age 5-7 module); two CYP samples for children (age 8-12 module) and adolescents (age 13-18 module); and four general adult population samples, one valuing each PedsQL GCS module. The stated preference task was designed to increase engagement using videos and pictures. The data were analysed using choice-based models accounting for scale and preference heterogeneity. Standard DCEs and BWSs do not automatically provide anchored values on the QALY 1–0 full health–dead scale for use in economic evaluation. We explored the use of a Time Trade Off (TTO) task and Visual Analogue Scale (VAS) to anchor the scores for the BWS and DCE. For the parent and adult samples, we used a DCE with duration task to directly calculate anchored utilities. Results: The data are currently in the process of final collection and analysis. The preliminary findings have resulted in four distinct tariffs for each age-specific full-item module: one for proxy/self-completed assessments and one for the general population. A preference-based tariff for proxy/self-completed assessments for the reduced form version of the PedsQL™ GCS and another for the general population for the reduced form version have been generated. Conclusion: This study will provide preference-based scoring of the PedsQL™ GCS measure, involving children and young people, parent proxies, and members of the general public. The selection of the appropriate tariff should consider the perspectives of decision-makers, weighing the advantages and disadvantages of each tariff.

abs-os266 Development of a PedsQL 4.0 GSC Reduced-Item Version for Preference-Based Valuation in Australia

PRESENTER: **Rakhee Raghunandan**, University of Sydney
AUTHORS: Martin Howell, Sarah Smith, Kirsten Howard, Joseph Kwon, Emily Lancsar, Son Nghiem, Mr. Stavros Petrou, Elisabeth Huynh

Background: The Pediatric Quality of Life InventoryTM Version 4.0 Generic Core Scales (PedsQL GCS) is one of the most widely used generic non-preference-based measures of childhood health-related quality of life (HRQOL). It includes 23 items covering four sub-scales (physical, emotional, social, and school functioning), and produces a total score on a linear 0 to 100 scale with higher scores denoting better HRQOL. Encompassing modules for ages two to eighteen years, the PedsQL GCS includes four age-appropriate versions (Toddlers, Young Children, Children, and Teens). Generic HRQOL instruments which generate health utility scores are useful for economic evaluations as they enable comparison across multiple conditions. Whilst the widely used PedsQL GCS is useful for assessing HRQOL, its application to aid cost-effectiveness-based decision-making is limited as it does not generate health utility scores. This study aimed to develop a reduced-item version of PedsQL GCS which can be used for health utility derivation in Australia.

Methods: Data were obtained from two cohorts of the Longitudinal Study of Australian Children and included the longitudinal sample of parent/caregiver proxy-reported responses for all PedsQL GCS versions (Toddlers, Young Children, Children, and Teens), and the cross-sectional CheckPoint sample containing child self-reported responses to the Children version. The analysis utilised three samples: the CheckPoint sample, the Mallinson sample, and the Toddlers sample. To account for repeated measures in the Rasch analysis, the Mallinson sample applied the Mallinson method to randomly select one measurement per child from one of the Young Children, Children or Teens versions. The PedsQL GCS sub-scale structure was confirmed using exploratory and confirmatory factor analyses. The psychometric analyses used Rasch and Classical criteria. Item selection prioritised psychometric performance in the CheckPoint sample, whilst considering performance in the two other samples and conceptual relevance.

Results: The exploratory and confirmatory factor analyses did not generate an alternative empirical structure for the measure, and the original four sub-scale structure was taken forward to psychometric analyses. Based on the psychometric criteria, the best-performing item from each sub-scale was selected for the reduced-item version of the PedsQL GCS. The selected items were: ‘Get aches and pains’ for physical functioning; ‘Feel sad/blue’ for emotional functioning; ‘Other kids not friends’ for social functioning; and ‘Keeping up with school work’ for school functioning.

Conclusion: The derived four-item PedsQL GCS version was developed using published recommended methods and a transparent item selection process. When accompanied by preference-based value sets, this reduced-item version can generate health utilities from the widely used PedsQL GCS to inform cost-effectiveness-based decision-making for children aged two to eighteen years.

abs-os272 The Social Value of a Child QALY - Revealed Preference Study Using Pharmaceutical Coverage Decisions in Australia from 2005 to 2023

PRESENTER: **Jing Jing Li**
AUTHORS: Emily Lancsar, Leonie Picton, Nayyereh Ayati, Anthony Harris, Kah Ling Sia, Nicola Huxley, Kirsten Howard, Rakhee Raghunandan, Duncan Mortimer

Context: A number of jurisdictions now formally include at least one aspect of equity, in addition to total health gains, in health technology assessment decisions. The equity aspect has largely focussed on need, expressed as potential years of life lost, but some agencies are thought to include age at least informally as a consideration. Recent literature suggests public support for giving greater weight to identical health gains in children versus adults, but no decision-making agency explicitly applies different weights to health gains for children. Objectives: To analyse revealed preference data to understand how factors related to paediatric populations (compared to the adult population) have influenced public subsidy decisions of pharmaceuticals in Australia. Methods: We compiled a dataset of evidence presented to the Australian Pharmaceutical Advisory Committee (PBAC) that makes recommendations on public subsidy of pharmaceuticals on the national Pharmaceutical Benefits Scheme. Our sample included all submissions to the PBAC from July 2005 to Nov 2023 if one of the outcomes measured was quality adjusted

life years (QALY) or if it was based on a cost minimisation analysis, assuming no incremental health benefits and only cost differences (N=1659). In our sample, 524 submissions had requested coverage for a child-only or child plus adult population. We econometrically tested whether interventions in children were more likely to be recommended for public subsidy compared to intervention in adults controlling for other factors that impact decisions. Results: Interventions targeting children were more likely to be recommended by the PBAC along with other significant factors including clinical uncertainty, clinical effect size, cost effectiveness and cost to government. Preliminary results suggest that compared to submissions for adults, submissions for children had significantly higher odds of being recommended after controlling for other major factors in decision making. Conclusion: We find evidence of a greater implied social value for health gains in children relative to adults in recommendations on pharmaceutical coverage decisions in Australia. This is the first study in the world to have demonstrated this in the context of public subsidy of pharmaceuticals.

1:30 PM –3:00 PM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

os246 Bali International Convention Centre – Jakarta A

Supporting Environmentally Sustainable Decisions with Health Economics Methods

MODERATOR: **Sandy Tubeuf**, Université catholique de Louvain (UCLouvain)

CONVENER: **Chris Sampson**, Office of Health Economics (OHE)

abs-os755 Adapting Health Economic Evaluation Methods to Include Climate Impacts: Intermediate Results of a Delphi Process

PRESENTER: **Wolf Rogowski**

AUTHORS: Don Husereau, Mattis Keil, Oliver Lange, Jule Oldenburg, Laura Maass

For making environmentally sustainable decisions, the existing health economic evaluation (HEE) methods need to be adapted to account for the environmental impacts of the decision alternatives under investigation. One important environmental concern is accounting for climate change. While the life cycle assessment (LCA) methods for estimating the impact of new technologies on global warming are well established, there is still a lack of standards for estimating and incorporating such impacts alongside health economic evaluations. This study reports on a methodological proposal that serves as a starting point for a Delphi process for extending the Consolidated Health Economic Evaluation Reporting Standards by climate impacts (CHEERS climatE) and the intermediate results of the Delphi process.

The proposal was based on an initial mapping of methodological items for estimating climate footprint to the reporting items of CHEERS. For 17 of the CHEERS reporting items, amendments were proposed and their potential application was illustrated using a hypothetical cost per DALY analysis. Based on these preliminary amendments, an expected three-round Delphi process with experts in HEE and / or LCA is planned early in 2025, aiming to refine the amendments and validate their relevance for inclusion into the extended reporting standard.

Generally, climate impacts can be accounted for both on the cost and the effect side of HEE. It requires estimating climate footprint using process- or cost-based methods based on the resources or costs estimated in the HEE. To incorporate climate footprint on the effect side, health impacts can be estimated using LCA models like ReCiPe. These negative impacts can be added to the health benefits of the technology itself. LCA impact models typically report health impacts in DALYs. Therefore, this option may be applicable, particularly for analyses based on DALYs as health outcomes. For incorporating climate impacts on the cost side, national standards for costing greenhouse gas emissions are frequently available that may need to be adjusted to exclude carbon prices that are already incorporated among the costs due to carbon trading schemes or taxes. Different summary measures are available to incorporate climate impacts, e.g. climate-effect or climate-cost adjusted incremental cost-effectiveness ratios, net monetary or net health benefits. Besides further details on how HEE can be adapted to include climate impacts, the current state of recommendations on how to report these adaptions from the ongoing Delphi process will be presented.

Given that an increasing number of jurisdictions require considering climate impacts in procurement decisions and in evaluating health technologies, this research may help develop standards for doing so in a transparent, harmonized way. Further work will be necessary to incorporate other ecological impacts besides greenhouse gas emissions.

abs-os754 Decision Analysis for Planetary and Human Health: Waste Management in the Life Sciences Industry

PRESENTER: **Mr. Chris Sampson**, Office of Health Economics

AUTHORS: Ellie Tunnicliffe, Grace Hampson, Matthew Napier, Sian Hodgson

Background: Biopharmaceutical and life sciences companies represent a significant sector of the economy and are important actors in the achievement of international environmental sustainability objectives. Where organisations in the sector value both planetary and human health outcomes, there may be challenging trade-offs that could be addressed by decision analysis, including tools routinely used in health economic evaluation. However, health economic analysis methods have seldom been applied in the development of environmental sustainability policy.

Aim: This research sought to inform waste management policy for a plasma derived therapies business in the United States. The objective was to identify the optimal waste management strategy when considering environmental impacts, human health impacts, and costs, and to inform new sustainability targets.

Methods: This study included literature review, decision-analytic modelling, and a decision conference. The literature review identified comparative life cycle assessments of i) landfill, ii) incineration, iii) waste-to-energy incineration, and iv) mechanical recycling. Quantitative estimates of environmental impacts were extracted and incorporated into a spreadsheet-based decision model. The model compared a set of realistic waste management options based on the company's biohazardous and non-hazardous waste streams and materials. It estimated midpoint and endpoint environmental factors in accordance with the ReCiPe framework; a widely used method of life cycle impact assessment. The two-day decision conference involved company decision-makers identifying, scoring, and weighting decision criteria. Scoring of midpoint environmental factors aligned with those reported by the decision model and weights were adopted in alignment with the European Commission's Product Environment Footprint (PEF) methodology.

Results: It was feasible to produce meaningful estimates to inform trade-offs. For example, for an average plasma donation centre over 1 year, our base case showed that landfill of all waste would generate around 14 million kg of CO2 equivalents, at a cost of around $225,000 and 519 disability-adjusted life years (DALYs). No waste management strategy dominated across all outcomes. In the base case, mechanical recycling combined with landfill dominated other options in terms of endpoints, though this was sensitive to alternative scenarios (e.g. time horizon). The decision conference concluded that wider adoption of mechanical recycling would be beneficial, and that targets and policies should be set accordingly. Where recycling is infeasible, landfill was identified as tending to be superior to incineration (with energy recovery), driven primarily by differences in greenhouse gas emissions.

Conclusions and implications: This study adopted well-established methods from health economics to address a decision problem that is primarily driven by the need to achieve more environmentally sustainable outcomes. The synthesis of evidence from life cycle assessments was challenging due to their limited comparability. Nevertheless, the decision model provided the scope to explore alternative scenarios and priorities, thus extending the value and applicability of published life cycle assessments. Decision conferencing, using methods of multi-criteria decision analysis, facilitated the balance of complex quantitative and qualitative inputs, while acknowledging corporate values and feasibility constraints. Evaluative health economics methods hold promise beyond their application to health care, and future research should explore their combination with established life cycle assessment (LCA) methods.

abs-os753 How Should Health Economic Evaluations Support Sustainability Considerations?

PRESENTER: **Mr. Andrew Briggs**
AUTHORS: Evi Germeni, Caitlin Macclancy

Background: There has been a proliferation of papers in the health economics and health technology assessment literature concerning the inclusion of environmental and sustainability factors into economic appraisals of health interventions. Although many such papers use the term sustainability, few define precisely what is meant by sustainability or how methods proposed will address sustainability concerns.

Aim: The aim is to explore the use of sustainability as a concept in terms of how it has been used in the literature and to consider how health economic evaluation approaches might be adapted to address sustainability concerns.

Methods: Drawing on a recent update of a published scoping review, the recently published scoping review of the literature from 2009 to 2021 was updated to 2023. The review was targeted at the proposed use of methods to address environmental and sustainability concerns in health technology assessment and guidelines. The review was expanded to consider how often sustainability as a term was employed in the papers reviewed and how often this term was defined. The author's own critique of those studies is presented alongside what sustainability considerations might mean for the conduct of health economic evaluation.

Results: Sustainability as a term was mentioned in eighteen of the final twenty-eight included reports that formed the 2021-23 update of the scoping review. Only one-third (six) of those studies attempted to offer a definition of sustainability. Sustainability seems to have been used synonymously with including environmental considerations by authors to date, yet this is not the commonly understood definition of sustainability. Adapting the 1987 United Nations Brundtland Commission definition of sustainability as *"meeting the needs of the present without compromising the ability of future generations to meet their own needs"* to the health context implies the need to consider trade-offs between health maximisation of the current generation compared to future generations. This was not considered by any of the articles covered by the scoping review.

Conclusions/implications: The use of the term 'sustainability' is widely used but ill-defined in recent manuscripts addressing the need to include environmental considerations into health technology assessments. No studies reviewed identified how methods would be used to manage inevitable health trade-offs between populations. Authors should be careful to define precisely what they mean by sustainability when proposing methods for incorporating sustainability considerations into health economic evaluations.

1:30 PM –3:00 PM MONDAY [Supply And Regulation Of Health Services And Products]

os45 Bali International Convention Centre – Magnolia

Telemedicine's Transformative Impact: Reshaping Healthcare Markets in Australia

MODERATOR: **Susan Méndez**, University of Melbourne

DISCUSSANT: **Terence Cheng**, Monash University

abs-os52 Does Telemedicine Affect Prescribing Quality in Primary Care?

PRESENTER: **Ms. Maria Wisniewska**
AUTHORS: Daniel Avdic, Johannes Kunz, Ms. Susan Méndez

Background: Our paper contributes to the literature on telemedicine and quality of care, specifically focusing on an innovative approach towards delivering primary care services via phone and video consultations. Current research shows mixed effects of telemedicine on quality of services, with some studies indicating that telemedicine can increase unwarranted prescription rates and lower guideline adherence. We add to the literature by exploring the adoption and consolidation of telemedicine in Australia among primary care providers from a supply-side perspective. **Objectives:** This study aims to investigate the impact of the nationwide rollout of telemedicine services in Australia on costs and quality of care among general practitioners. Specifically, the study seeks to analyse how utilisation of remote consultations affects antibiotic prescriptions rates. Furthermore, our research delves into the characteristics of telehealth service providers, considering distinctive physician-specific traits such as age, gender, educational background, personality and attitudes toward digital health technology. **Methods:** The study employs a two-stage empirical strategy: first, we classify physicians into fast and slow telehealth adopters based on their intensity of utilising newly-introduced telemedicine services during the country-wide COVID-19 lockdown period. Second, we compare their rates of antibiotic prescriptions before and after lockdown periods using a difference-in-differences empirical design. In the study, we use the Medicine in Australia: Balancing Employment and Life Australia's (MABEL) national longitudinal survey of doctors linked with administrative records of all benefits and pharmaceuticals reported on the physician level. We also use population-wide data from the Person Level Integrated Data Asset (PLIDA) to show robustness of our results and analyse long-term impact until the last quarter of 2022. **Results:** Our study finds that the rate of antibiotic prescriptions per consultation of fast adopters decreased significantly – by around 10% – relative to slow adopters. While the absolute amount of antibiotic prescriptions remained on a similar level across both groups, we show that the decrease in prescribing rates is driven by a significant increase in the total number of conducted visits. The study also identifies that telehealth did not elicit risky prescribing behaviour nor did it impair the quality of services, as fast telemedicine adopters reduced their use of broad-spectrum antibiotics for respiratory tract infections compared to slow adopters by around 5%. Additionally, there was a small but insignificant increase in total visit costs, however it was mainly covered by government subsidies. **Discussion:** The insights from our study have implications for healthcare policy, showing that telemedicine doesn't elicit risky prescribing behaviours among general practitioners. Our results indicate that the adoption of telemedicine did not compromise the quality of care. Physicians who adopted telemedicine more intensely reduced their rates of antibiotics prescriptions and, at the same time, conducted relatively more consultations. These results point to two conclusions: first, telemedicine may have a potential in improving the efficiency of conducting primary care consultations. Second, this solution might be used in bringing high-quality care to isolated and disadvantaged groups, especially in areas with large rural and low-populated regions.

abs-os56 Impact of Telehealth Adoption by Psychiatric Specialists on Wait Times.

PRESENTER: **Mr. Ou Yang**, Melbourne Institute of Applied Economic and Social Research
AUTHOR: Yuting Zhang

Background: One significant challenge within Australia's universal healthcare system is the rising waiting times to see medical specialists. Psychiatry has become one of the most consulted medical specialties outside of hospital settings, receiving substantial subsidies from Medicare. Despite this support, there is a notable lack of evidence regarding waiting times for psychiatric specialist consultations for general outpatients in Australia. Telehealth is often considered an effective tool for reducing waiting times and overcoming geographical barriers. However, in Australia, there has been very limited evidence on how telehealth services interact with in-person consultations, largely due to the underutilisation of telehealth before the COVID-19 pandemic. In response to the COVID-19 pandemic, there have been several incentives to encourage telehealth adoption in Australia since 2020 Understanding the interactions between telehealth and in-person services is critical for evaluating the effectiveness of these existing incentives and investments. **Objectives:** Our study aims to investigate how the wider adoption of telehealth for psychiatric specialist consultations in Australia affects consultation waiting times and fees. **Methods:** We analyse all records of Medicare-rebated GP referrals to psychiatric specialist across Australia from Q1 2011 to Q3 2023 sourced from the Medicare Benefits Schedule (MBS) data collection within the Person Level Integrated Data Asset (PLIDA. We apply a fixed effects linear regression which respectively relates waiting time and fee to telehealth adoption, controlling for the referral pair fixed effects between GPs and specialists. **Results:** We find that wider telehealth adoption leads to higher waiting times on average in Australia, which is mainly driven by higher waiting times for in-person consultations. In contrast, wider telehealth adoption leads to shorter waiting times for telehealth consultations. Wider telehealth adoption leads to about 0.04 dollars lower fees, which is statistically significant but in practice very small. **Discussion:** The potential benefits of telehealth in reducing specialist consultation waiting times and costs seem to be offset by increased demand, driven by improved accessibility. It would be more effective to invest in lifting psychiatric specialist service capacity by addressing health workforce shortages.

abs-os51 The Economic Impact of Telemedicine Uptake on General Practitioners in Australia.

PRESENTER: **Ms. Susan Méndez**, University of Melbourne
AUTHORS: Bishal Kumar Chalise, Daniel Avdic, Paul Amores, Carol Propper, Anthony Scott

Background: The COVID-19 pandemic prompted rapid diffusion remotely provided telemedicine consultations that has profoundly reshaped healthcare delivery, financing, and market dynamics structures in primary care. While existing research has explored the impact of telemedicine on healthcare access and quality, few studies have addressed its impact on general practitioners' financial and economic outcomes in a system with managed competition. This study fills a critical gap in understanding telemedicine's broader implications in primary care in a market setting where doctors prices are not directly regulated. **Question:** This study investigates the impact of telemedicine adoption on GP consultation patterns, billing practices, and costs to patients in Australia. **Methods:** The study uses detailed survey data from GPs (MABEL) linked to administrative records of their service provision from the Medicare Benefit Schedule (MBS) and Pharmaceutical Benefit Scheme (PBS). To address doctors' potentially endogenous decisions to adopt telemedicine, we adopt an instrumental variables approach where telemedicine uptake in each local area is instrumented by changes in physical mobility from Google mobility data. **Results:** Our findings

suggest that the degree of telemedicine uptake does not change the number of services physicians provide but increases fees for both face-to-face and telemedicine consultations. While the increased costs of face-to-face consultations are largely passed on to patients in terms of higher out-of-pocket costs, the higher price of telemedicine services is mainly subsidised by the government. **Conclusions:** Telemedicine adoption influences not only service delivery models but also the economic dynamics within primary care. Our results suggest that telemedicine uptake is associated with higher prices but not necessarily higher quality or access. Further analysis is required to study the specific market channels underlying these results, including competition for patients and service differentiation.

1:30 PM –3:00 PM MONDAY [Evaluation Of Policy, Programs And Health System Performance]

os68 Bali International Convention Centre – Singaraja

Improving Health Systems Efficiency: Strategies for Spending Optimization and Risk Factor Control in OECD and Global Contexts

MODERATOR: **Joseph Dieleman**, Institute for Health Metrics and Evaluation, University of Washington

CONVENER: **Sungchul Park**, Korea University

DISCUSSANT: **Karen Grépin**, The University of Hong Kong

abs-os71 Association of Social and Health Spending with Disability-Adjusted Life Years and Death among 38 OECD Countries Between 2000 and 2019

PRESENTER: **Sungchul Park**, Korea University
AUTHORS: Joseph Dieleman, Subu Subramanian, Rockli Kim

Background: Social and health spending are crucial for improving health outcomes, but the mechanisms underlying these associations remain unclear. Existing literature suggests that both types of spending are associated with higher life expectancy, which measures quantity of life. However, the impact on quality of life may differ. To gain a deeper understanding of this relationship, we examined the associations of social and health spending with Disability-Adjusted Life Years (DALY), Years of Life Lost (YLL), Years Lived with Disability (YLD), and death rates among 38 countries in the Organisation for Economic Cooperation and Development (OECD) from 2000 to 2019.

Methods: We analyzed data from the Global Burden of Disease Study 2021 as well as from the OECD and World Bank. Our sample included 38 countries. The outcome measures comprised age-standardized rates of DALY, YLL, YLD, and death per 100,000 population. The key independent variables were social and health spending as a percentage of gross domestic product (GDP). Social spending was defined as expenditures on social programs, including funding for active labor-market programs, incapacity and unemployment benefits, family support programs, housing, and pensions. Health spending included a wide range of expenditures on health care goods and services, encompassing mandatory government spending, voluntary health insurance, and private out-of-pocket expenses. To estimate the association of social and health spending with health outcomes, we conducted a fixed effects model. We controlled for time-varying factors using population size, age distribution, percentage of females, the Socio-demographic Index, employment rates, population attributable fraction of modifiable risk factors, and year. To account for potential lagged effects, we analyzed the key independent variables as concurrent, one-year lagged, and two-year lagged. We conducted analyses for the overall population as well as for males and females separately.

Results: Our fixed-effect analysis revealed significant associations of health and social spending with health outcomes, but the patterns varied. Specifically, a one-percentage-point increase in health spending was associated with a decrease of 8.7 (95% CI: -12.3, -5.2) death per 100,000 population and an increase of 105.9 (95% CI: 17.3-194.5) DALY per 100,000 population. The increase in DALY was primarily driven by an increase in YLD of 74.7 (95% CI: 61-88.5) per 100,000 population. In contrast, social spending did not show a significant association with DALY, but a one-percentage-point increase in social spending was associated with a decrease of 15.7 (95% CI: -22.9, -8.6) YLD per 100,000 population. When accounting for lagged effects, the magnitude of the associations with health spending increased, while the magnitude of the associations of social spending decreased.

Conclusion: These findings highlight the distinct mechanisms through which health and social spending impact health outcomes. Health spending predominantly influences mortality, while social spending appears to enhance quality-of-life measures. Policymakers should consider these complementary effects when designing interventions to optimize health outcomes.

abs-os70 Health Care Spending Efficiency and Key Associations: 204 Countries, 1995-2021

PRESENTER: **Joseph Dieleman**, University of Washington
AUTHORS: Amy Lastuka, Kayla Taylor, Michael Breshock

Introduction: Many high- and middle-income countries' governments are facing increasing pressure to stabilize or prevent growth in health care spending, while all countries are called to maximize the budget they have. Finding ways to increase efficiency of health spending can ensure that health outcomes continue to improve in a tight fiscal environment.

Methods: We estimated the efficiency of health spending in 204 countries from 1995 through 2021 using a stochastic non-linear frontier meta-analysis model, a new extension of traditional stochastic frontier analysis (SFA) that incorporates non-linear splines and sampling error as well as non-sampling error via random effects. We fit two frontiers using health adjusted life expectancy and under-five mortality as health outcomes

and assessed the estimated country- and year-specific inefficiency.

Results: The health system efficiency for preventing under-five mortality improved from 1990 to 2021 for all regions globally. For health adjusted life expectancy, efficiency improved through 2019 and then decreased in 2020 and 2021, due to the COVID-19 pandemic. We found that if all countries were to move from their 2019 level of health outcomes to the frontier, 6.5 million (95% CI 4.9-8.7) under-five deaths could be avoided annually, and health adjusted life expectancy could increase by 1.5 (95% CI 1.3-1.8) years per capita. We found that a having a higher percentage of health expenditure from the government or pre-paid private sources was associated with more efficient spending. Other factors associated with increased efficiency were a higher democracy index, a higher percentage of women in parliament, and higher road density. Having a higher percentage of health expenditure from donor assistance, government corruption and having more fragmented donor spending, in terms of the number of sources and designated program areas, were associated with less efficient health spending. A higher percentage of out-of-pocket spending was associated with less efficiency for under-five mortality but not for health adjusted life expectancy.

Discussion: These associations support the perspective that increasing the proportion of citizens who are covered by insurance, either through the government or pre-paid private insurance, would increase efficiency of the health care system. Countries should also focus on strengthening democracy and controlling corruption. Future research should look at spending by health condition where possible to specifically examine allocative efficiency.

Ind-819 Examining the Associations Between Long-Term Care Expenditures, Medical Care Spending, and Health Outcomes: A Panel Data Analysis of OECD Countries

PRESENTER: **Yuqian Lin**
AUTHORS: Mr. Terence Cheng, Ms. Winnie Yip

Background: The rising challenges posed by population aging, prolonged life expectancy, and an increasing prevalence of disability among the elderly have led to a substantial surge in the demand for long-term care (LTC) services. In 2021, OECD countries spent an average of 1.8% of GDP on all LTC services, with a 5-year growth rate of 6%. On the supply side, declining fertility rates and changing family structures have led to a reduction in the provision of informal care. Given the labor-intensive nature of LTC, achieving productivity gains in the LTC sector remains a significant challenge. Consequently, the growth in long-term care spending is expected to surpass that of general health care expenditures in the coming years. However, the impact of LTC spending on overall health system performance remains less understood.

Research Aim: This study aims to examine the relationship between LTC expenditures, medical care spending, and health outcomes, to provide insights on whether increasing spending on long-term care truly contributes to improved health system outcomes.

Methods: We constructed a panel of 41 OECD countries, covering the years 2000 to 2021 using data from OECD Health Statistics, UN World Population Prospect, and Global Burden of Disease. A panel regression model with country and year fixed effects was estimated to analyze the association between long-term care expenditure as a percentage of GDP, and three sets of health system outcomes: medical care expenditure, medical care utilization, health outcomes among the older population.

Results: Our findings indicate that long-term care expenditure is positively associated with higher medical care spending, and this relationship is observed at a number of different spending categories (total, inpatient, and outpatient). The association between LTC expenditure and outpatient medical care spending is particularly strong, and our results indicate that this is potentially driven by a greater utilization of physician visits. In terms of inpatient care, we observed that higher LTC expenditure is associated with shorter hospital lengths of stay. While we did not find a significant association between LTC expenditure and life expectancy, we identified consistent patterns showing a negative association between LTC spending and mortality and morbidity related to unintentional falls.

Conclusion and implications: Overall, our results indicate that increased spending on LTC is linked to higher medical care expenditure, greater utilization of outpatient care, shorter hospital stays, and reduced mortality and morbidity from unintentional falls. Our results highlight the complex interplay between LTC and medical expenditures, and its potential role in improving health status of older persons. The findings underscore the need for policymakers to consider the broader implications of LTC financing to achieve effective allocation of resources and ultimately improve health outcomes and enhance the sustainability of health systems in the face of an aging population.

3:00 PM –3:30 PM MONDAY [Social Events]

Bali International Convention Centre – BICC Foyers

Refreshment Break

3:30 PM –5:00 PM MONDAY [Health Beyond The Health System]

Bali International Convention Centre – Dahlia

Shaping Birth Outcomes: Social, Economic, and Policy Influences

MODERATOR: **Asmamaw A. Ayalneh**,

Ind-1532 The Impact of In-Utero Exposure to the Great Recession on Birth Outcomes in South Korea

PRESENTER: **Youna Lim**
AUTHOR: Tae-jin Lee

While extensive research has documented the socioeconomic impacts of economic crises, their long-term effects on early-life health outcomes remain understudied, particularly in Asian economies. This study addresses this empirical gap by investigating the causal impact of in-utero exposure to the 2008 Great Recession on birth outcomes and subsequent child development in South Korea, examining both immediate and longitudinal health consequences.

This study implements a difference-in-differences methodology to estimate the causal effects of recession exposure by utilizing comprehensive Korean National Health Insurance Service (K-NHIS) data for children born between 2006 and 2014. The identification strategy leverages regional heterogeneity in real Gross Regional Domestic Product (GRDP) per capita, with regions below the national average designated more severely affected. The analysis encompasses birth outcomes, including birth weight, low birth weight incidence, preterm births, and postnatal physical development indicators (height, weight, and head circumference) tracked longitudinally up to 60 months of age. The study designates 2009 as the economic crisis period and examines outcomes for in-utero-exposed cohorts.

Empirical results demonstrate significant adverse effects on both birth outcomes and subsequent development. In-utero exposure to the economic crisis was associated with reduced birth weight and elevated incidences of low birth weight and preterm births. These effects persisted into early childhood, with significant height reductions observed at 36 and 60 months in crisis-affected regions. Composite physical development assessments revealed higher probabilities of requiring clinical observation after 36 months, indicating persistent crisis-related developmental impacts.

Heterogeneity analyses stratified by income quintile (proxied by insurance status) revealed that the most pronounced effects manifested in the third, fourth, and fifth quintiles. Birth weight reductions were particularly significant in the third and fourth quintiles, while preterm birth rates increased notably in the fifth quintile. Further stratification by maternal health insurance status demonstrated that offspring of mothers experiencing employment transitions or job loss exhibited the most substantial adverse effects, including reduced birth weight and diminished postnatal growth trajectories. These findings illuminate direct and indirect pathways through which economic downturns affect intergenerational health outcomes.

Robustness tests employing alternative economic indicators, including unemployment rates, corroborated the primary research findings. Comprehensive data analysis and placebo tests validated the causal relationship between economic crisis exposure and adverse health outcomes. The research demonstrates persistent intergenerational health consequences of economic instability, highlighting critical implications for early developmental trajectories. These findings emphasize the necessity of targeted interventions and evidence-based policies to mitigate long-term health risks for vulnerable populations during economic downturns.

Ind-2255 Educational Challenges of Children Admitted to the Neonatal Intensive Care Unit: A Longitudinal Study in Ireland

PRESENTER: **Mario Martinez-Jimenez**
AUTHOR: Orla Doyle

Advancements in the viability of extreme preterm birth—defined as birth before 37 weeks of gestation—have been remarkable, driven by groundbreaking research and medical innovation. In the 1970s, the youngest surviving infants were born at around 27 weeks, whereas today, viability is possible as early as 22 weeks, with higher chances of survival depending on whether they are admitted to a level 3 neonatal intensive care unit (NICU). Despite these advancements, extremely preterm infants remain at high risk for mortality and adverse long-term health outcomes. Using data from Growing Up in Ireland (GUI), a longitudinal cohort study following the lives of children born in 2008, we study the effects of being admitted to a NICU at birth on educational performance (reading and math tests) at age 9. We employ a regression discontinuity design (RDD) and exploit the variation of birthweight in the chances of being admitted to NICU. Preliminary results show that NICU admission is associated with lower average performance in both reading and math at age 9. These effects are particularly pronounced for children from lower socioeconomic backgrounds, suggesting that the educational challenges of NICU-admitted children may be exacerbated by socioeconomic disadvantage. Policy efforts should focus on enhancing support mechanisms within schools and communities, ensuring that children with a history of NICU admission, particularly those from disadvantaged backgrounds, have equitable access to resources that promote academic success.

Ind-2469 The Impact of Alcohol Bans on Birth Weight in South Africa

PRESENTER: **Tsepang Khumalo**

Alcohol consumption remains a significant global challenge, contributing to 2.6 million deaths in 2019. Alcohol not only leads to mortality, but it also has negative externalities on society. Excessive alcohol consumption is associated with accidental trauma, violent crimes, and significant health risks. To tackle alcohol abuse, governments have implemented alcohol control policies. Understandably, considerable research has focused on the impact of these policies on adult health outcomes as the policies primarily target adults. However, there is limited evidence of the effect of these policies on neonatal health, despite the long-term implications of neonatal health on future adult well-being and socioeconomic success. To address this gap in the literature, this study examines the impact of a policy that restricted access to alcohol on birth weight in South Africa. To identify the causal effect, I leverage the sudden and unexpected nationwide alcohol ban policy implemented from 27 March 2020 to 31 May 2020. The universal alcohol ban on the sales and transportation of alcohol was implemented in response to the COVID-19 pandemic by the South African government. The ban was enforced with strict intensity, making it a good natural experiment to estimate the causal impact of an alcohol restriction policy on neonatal health. I use birth records from 2017 to 2024 of women and children

participating in Building Healthier Communities (BHC) study. The BHC dataset provides detailed information on mothers and birth outcomes for children under 5 in Western Cape, South Africa. I compare the birth weight outcomes of neonates born to mothers who experienced the alcohol ban during pregnancy with those born to mothers unexposed to the alcohol ban. By natural design, there is no selection into pregnancy among these women during the alcohol ban. Thus, I estimate the causal impact of the ban on neonatal health outcomes using Ordinary Least Squares (OLS) regressions. I find that a policy that decreased alcohol availability improved birth weight. Specifically, I find that intrauterine exposure to the alcohol ban in the first trimester increases birth weight by 0.229 kilograms (kg). A heterogeneity analysis of a second ban implemented 6 weeks later indicates that the effects of the first ban results persist through the second trimester of the second alcohol ban. Specifically, the second-trimester exposure to the second alcohol ban increases birth weight by 0.252 kg. I observe a larger impact on birth weight because the study is based in the Western Cape province which is reported to have the highest prevalence of Fetal Alcohol Spectrum Disorders (FASD) in the world. Therefore, a ban on alcohol substantially affects health outcomes in this setting. The findings suggest that interventions to reduce alcohol consumption can improve child health outcomes. Considering the long-term effects of neonatal health on later-in-life human capital outcomes, such as education, productivity, and earnings, these results underscore the broader societal benefits of strict alcohol policies. These measures can positively impact future generations beyond their immediate targets.

Ind-2699 Hidden Disparities: Exploring the Multilevel and Spatial Determinants of Neonatal Health in Indonesia

PRESENTER: **Rooswanti Soeharno**
AUTHOR: Zahra Avia

Background. Despite achieving the Sustainable Development Goal (SDG) for under-5 mortality reduction, Indonesia's Neonatal Mortality Rate (NMR) remains a significant public health challenge, with over 70,000 deaths reported in 2018. This persistent burden undermines the country's "Great Indonesia 2045" vision, revealing systemic inequities and quality gaps in maternal and neonatal care. Financial barriers have been reduced, increasing healthcare utilization, but neonatal health outcomes remain stagnant due to socioeconomic disparities, geographic variations, and inadequacies in service quality. This study examines the multilevel and spatial determinants of neonatal health outcomes to inform targeted, equity-focused interventions. **Methods**. Data from Indonesia's 2018 national surveys, covering 34 provinces, 513 districts, and over 300,000 households, were analyzed. The sample included 73,086 women aged 10–54 who gave birth in the preceding five years. Multilevel regression, concentration indices, and spatial regression models were applied using STATA 14.0 and ArcGIS Pro 3. The analysis incorporated individual, community, and systemic factors, including maternal care quality, healthcare readiness, and fiscal capacity. Policy implications were assessed in alignment with the seven pillars of Indonesia's national health system. **Results**. NMR remains alarmingly high, with disparities evident across socioeconomic groups and geographic regions. Four models were explored, each adding complexity by integrating individual and community factors to assess neonatal risks. The Null Model, which excludes predictors, has an Intraclass Correlation Coefficient (ICC) of 0.2082, showing that 20.82% of risk variation is attributed to community-level differences. The Full Model (Model 4), combining both individual and community predictors, further reduced the ICC to 0.1600 and achieved the highest proportional change in variance (PCV) at 28%. The Median Odds Ratio decreased from 2.43 (Null Model) to 2.13 (Full Model), highlighting the effectiveness of the Full Model in offering a robust explanation of neonatal health risks, emphasizing the role of community and systemic factors in shaping outcomes. High NMR rates were concentrated in districts with limited fiscal capacity, poor antenatal care access, and low institutional delivery rates, while wealthier districts demonstrated higher service utilization. Quality of care was a key determinant, with antenatal services and institutional births significantly influencing outcomes. However, cultural reliance on traditional practices and barriers to facility-based care contributed to high out-of-facility birth rates. **Policy Implications**. Equity-focused policies are critical to reducing neonatal mortality and addressing systemic disparities. Prioritizing fiscal support for under-resourced districts is essential to bridging gaps in service quality and accessibility. Strengthening antenatal and institutional delivery services in underserved regions, coupled with culturally tailored community interventions, can improve care-seeking behavior and facility-based births. Spatial and multilevel analyses should guide the design of localized interventions, targeting areas of greatest need. Investments in supply-side readiness, including infrastructure and workforce capacity, are vital for ensuring equitable access to quality maternal and neonatal care. These evidence-based strategies will advance Indonesia's SDGs and its vision of "Great Indonesia 2045," reducing preventable neonatal deaths and fostering health equity nationwide.

3:30 PM –5:00 PM MONDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Surabaya

Incentivising Performance and Care

MODERATOR: **Luigi Siciliani**,

Ind-739 Pay for Performance, Health Inequalities and Equity-Efficiency Trade-offs in Primary Care

PRESENTER: **Luigi Siciliani**, University of York
AUTHORS: Ni Gao, David Glynn, Simon Walker, Nils Gutacker, Tim Doran

Motivation

Reductions in of health inequalities is a main policy objective across many health systems. Reimbursement mechanisms for providers are commonly used as policy levers to align provider behaviour with health systems objectives. Current reimbursement mechanisms are mostly based on activity, process quality indicators and patient health outcomes. But it is not clear how much they can contribute to reducing health inequalities.

Aims

We develop an approach that allows to assess equity-efficiency trade-offs when designing financial incentives for healthcare providers. We focus on socioeconomic inequalities in health, and how financial incentives can change the health distribution across groups with different socioeconomic status.

Methods

To investigate how the design of financial incentives can incorporate equity considerations in addition to efficiency ones, we develop a theoretical model of provider behaviour in primary care under a pay-for-performance (P4P) scheme that mimics the Quality and Outcome Framework (QOF) in England. We show how a change in the reimbursement tariff for process measures of quality affects the distribution of health across socioeconomic groups.

We assume that the regulator who is responsible for changes in the P4P scheme accounts for societal *health inequality aversion* when assessing the scheme's effect on the health distribution across socioeconomic groups by computing an Equally Distributed Equivalent level of health. Therefore, if a change in reimbursement improves health but increases health inequalities, the regulator can assess whether the improvements in health can be traded-off against the increase in health inequalities.

After developing our theoretical framework, we *calibrate* the model and simulate the effect of different plausible interventions. Our primary focus is on patients with type-2 diabetes, which has a high prevalence across countries. We then conduct several *simulations* on possible changes in the reimbursement mechanism.

The first simulation relates to changes in reimbursement for different process measures of quality within a health condition, in our case diabetes. Statins are commonly used as an effective medicine to lower cholesterol, and prescribing of statins for people with cardiovascular disease is incentivised under the QOF scheme in England. We simulate the effect of increasing the reimbursement tariff for primary care providers who increase the use of statins for diabetes patients, while simultaneously reducing the tariff for other incentivised indicators to retain budget neutrality of the QOF budget.

In the second simulation, we examine changes in tariffs across different diseases, for example an increase in tariff to incentivise diabetes financed through a reduction in tariff for another incentivized condition, such as Chronic Obstructive Pulmonary Disease.

In the third simulation, we look at changes in tariff for a given indicator, but we allow the reimbursement to differ by socioeconomic group.

Results

Our results suggest that changes in financial incentives that improve population health either reduce health inequalities or that the increase in health inequalities does not offset the increase in health even for high levels of inequality aversion.

Conclusion

Our analysis illustrates how inequality aversion can be taken into account when assessing the effect of changes on financial incentives on the health distribution across socioeconomic status.

Ind-2086 Healthcare Providers Vertical Coordination. Evidence From the French Bundled Payment Initiative.

PRESENTER: **Thomas Pelloquin**

This paper leverages the French episode-based bundled payment scheme, implemented across a set of 22 hospitals, to assess healthcare providers' responses to coordination incentives and the subsequent efficiency of the episode of care.

Bundled payments aim to reduce costs by improving care coordination through a single payment that covers treatment before, during, and after hospitalization. Existing literature, however, lacks research on the coordination mechanisms that contribute to efficiency gains.

The paper begins by analysing the expected responses to bundled payments from a theoretical standpoint. It defines a healthcare pathway involving multiple providers, each contributing to the baseline efficiency of treating patients. The model assumes that bundled payments involve hospitals—who are the recipients of the incentives—managing the cost of the entire care episode, albeit with limited control over external providers.

Hospitals can exert effort to reduce costs, but the marginal return on effort diminishes, particularly for those with higher baseline efficiency. Overall, the results highlight the ability of hospitals to influence the care episode by either reducing the overall amount of care provided, potentially decreasing quality, or by changing the distribution of tasks across providers -for example, by increasing the in hospital intensity of care-, resulting in substitution.

To empirically test these hypotheses, the paper utilizes data from the French national health data warehouse (Système national des données de santé - SNDS), which includes claims data for patients undergoing hip replacement surgeries between 2017 and 2022. The dataset comprises over 477,000 patients across approximately 700 hospitals, with detailed information on patients' health conditions, comorbidities, and care settings.

The data include the costs of each care episode, covering the period from 45 days before to 90 days after surgery. These costs encompass primary care, in-hospital care, and post-acute care facilities, as well as quality outcomes such as 30-day and 90-day readmissions. The study

employs a distributional difference-in-differences approach to compare treated and control episodes of care. To address selection bias, it uses an instrumental variable derived from the characteristics of patients admitted in the years preceding the introduction of the new payment scheme at participating hospitals.

The empirical results show a limited impact from the introduction of the new payment model. The data suggest a possible intensification of care within hospitals, associated to an improvement in quality, potentially linked to the additional resources made available under the initiative. The study explores reasons for this modest effect. Participating hospitals were already performing well in terms of patient transfers to post-acute care facilities, possibly due to the structure of their local healthcare markets.

Ind-2399 Can a Supplementary State Incentive for ASHAs in Addition to National Incentives Contribute to Better Healthcare Utilization?

PRESENTER: **Sujata Mishra**, University of Toronto
AUTHOR: Beverley Essue

Background: In low- and middle-income countries (LMICs), fostering motivation, enhancing performance, and ensuring the retention of community health workers (CHWs) are critical challenges. Within this context, incentives, particularly monetary ones, have been identified as key motivators for CHWs. In India, CHWs such as Accredited Social Health Activists (ASHAs) play an important role in the country's health system and are compensated through a combination of fixed and performance-based incentives. However, evidence on the impact of these incentives on CHW performance and health outcomes remains inconclusive. This study investigates whether state-level supplementation of ASHA incentives, in addition to the national program, improves uptake of three priority health utilization indicators in India. It also examines whether the type of incentive—assured fixed versus variable performance-based—affects key maternal and child health utilization indicators.

Methods: The study uses data from the National Family Health Survey (NFHS-V) (2019–2021) and national and state-level reports from 2014 to 2021. The analysis focuses on three priority health utilization indicators for Indian Government: institution-based deliveries, complete antenatal care, and full immunization for children aged 12–24 months. Propensity score matching and generalized estimating equations models were used to assess the association of state supplementation with these health utilization indicators.

Findings: The study included 232,920 women (mean age 27 years), with 73% in residing in rural areas, 22% having no education, and 44% living below the poverty line. Nearly half belonged to the poorest wealth index, 23% had health insurance, and 55% lived in Central or Eastern India. In terms of existing state policies, as of 2014, 11 of 28 states and 8 Union Territories had implemented policies offering supplementary incentives to ASHAs, expanding to 22 states by 2021.

The findings indicate that women in states that provided supplementary incentives to ASHAs had at least 1.1 to 1.2 times (95% CI=1.1-1.3) greater odds of utilizing all three health services compared to states without such incentives. Use of ASHA services were associated with higher odds of health utilization for all three outcomes of study, indicating the positive role of these frontline workers in improving maternal and child health. Furthermore, women with higher education, greater wealth, or access to health insurance, as well as those registering early for antenatal care, were more likely to use health services. In contrast, marginalized groups including rural residents, those in poor/poorest wealth index, and individuals from Schedule Castes/ Schedule Tribes, faced reduced access to services. These findings provide limited evidence regarding the effectiveness of different incentive types and amounts. Specifically, it could not conclusively establish the advantages of state-assured fixed incentives versus performance-based incentives or vice versa.

Conclusion: This study is one of the first to examine the impact of state-level supplementary incentives for ASHAs on the utilization of three priority maternal and child healthcare services. The findings reveal improved health service utilization in states offering these incentives. However, the effectiveness of specific incentive types and amounts remains inconclusive, highlighting the need for future research to optimize incentive structures for CHWs and improve healthcare utilization.

Ind-716 The Supply Side Effects of Long-Term Care Insurance in China

PRESENTER: **Feng Huang**
AUTHOR: Chunjie Wu

Although public long-term care insurance (LTCI) programs are prevalent globally, their ability to improve the market provisions of long-term care (LTC) has not been comprehensively evaluated. This paper addresses this literature gap by examining China's LTCI pilot program from 2016 to 2019. The pilot provided public insurance for individuals aged 60 and above to reimburse LTC services at regulated prices. In 2016, the Chinese central government initiated this program to assess the feasibility and sustainability of a potential nationwide LTCI scheme, as China had an estimated 20.61 million elderly individuals (8.1% of the old-age population) in need of assistance for activities of daily living in 2020. The pilot was implemented in 35 cities across 14 provinces in a staggered fashion by 2019. We exploit the temporal and geographical variations in LTCI availability arising from the staggered implementation of the program to uncover the causal impacts of LTCI on LTC supply and individual formal care utilization. Our empirical analysis leverages data compiled from four sources. First, we manually extract the timing of LTCI policy enactment at the city level from government websites and policy reports. Second, to assess the supply-side effects of the policy, we identify new LTC providers using administrative data on establishment registration. Third, we gauge LTC labor market outcomes using the China Migrants Dynamic Survey (CMDS), a comprehensive annual nationwide survey that collects demographic and employment information of migrant households. Finally, we measure care utilization patterns using the Chinese Longitudinal Healthy Longevity Survey (CLHLS), which contains data on the demographic characteristics, socioeconomic status, family background, health conditions, and healthcare and long-term care utilization of individuals aged 65 and above. We use a staggered difference-in-differences (DID) framework to investigate the program's impact on the entry of new care providers. We estimate a 1.88-time increase in quarterly LTC provider entries after introducing LTCI. However, unobserved changes to the LTC industry may confound our ability to determine the causality of this estimate. To address this concern, we adopt

three strategies. First, we include a time trend dependent on city characteristics before the pilot in 2010. Second, we conduct event studies using the state-of-the-art methodology proposed by Sun and Abraham (2021) and find that supply-side outcomes remained stable before the program's implementation. Lastly, we show that the order of LTCI pilot implementation is unrelated to city-level characteristics. We find that LTCI increased the number of quarterly LTC provider entrants by 188% and LTC employment share by 27.2%. We estimate a model of elderly individuals' choice between informal and formal care. Our model estimates indicate that supply expansion and improvement in affordability driven by LTCI led to a 3.35% and 15.14% increase in the aggregate share of formal care use among eligible LTCI beneficiaries, respectively. This paper contributes to the literature by presenting, to our knowledge, the first comprehensive empirical study on whether public insurance can alleviate the widespread under-provision of long-term care in a developing country.

Ind-2660 Linking Public Financial Management to Quality Improvement Processes: Improving Nigeria's Primary Health Care Quality

PRESENTER: **Bolanle Olusola-Faleye**
AUTHORS: Benjamin Madaki, Deji Bodunde

Background

Public Financial Management (PFM) theory suggests that improvements in the allocation, execution, and monitoring of public funds can contribute to improved health outcomes. Nigeria's Basic Health Care Provision Fund (BHCPF) is a pro-poor public program for expanding access to health services that provides direct facility financing to primary health care facilities to improve their service delivery. Facilities must produce a business plan and report expenditures against it to receive funding. Furthermore, a quality assessment exercise has been digitalized to facilitate its quarterly implementation. This analysis aims to demonstrate a positive association between effective public financial management and quality improvement processes in the BHCPF program.

Methodology

Routine PHC facility inspection and quality assessment were carried out in 205 facilities in Plateau State quarterly in 2023. The digitally produced scorecard identified quality gaps that were discussed with the facility staff who then identified specific quality improvement interventions for inclusion in their next quarter's business plan. Alignment of facility priority investments to quality improvement plans, tracking of funds released to facilities, and facility financial expenditure reporting became a cyclical, quarterly practice. The scorecard uses a 'traffic light' color coding system to indicate the level of performance for each of 10 priority areas so that increased scores are easily comprehensible when printed and posted on facility notice boards. A convenience sample of high and low scoring facilities was chosen for key informant interviews, business plan reviews and expenditure tracking to identify challenges with budgeting for or implementing quality improvement processes.

Results

In Plateau State, there was a substantial improvement in the overall quality assessment score in Q3 2023, rising from 74% in Q2 to 78% in Q3. Facilities in 7 out of 17 LGAs had optimal quality scores (>80%) in Q3 compared to 3 LGAs in Q2 of 2023. Specifically, Laboratory Services and Community Engagement scores increased across board. Given these improvements, there is an on-going review of business plans across select facilities to cross check alignment of business plans with quality assessment findings, and alignment of business plan expenditures with quality assessment improvements over the final three quarters of 2023. Inadequate training, financing, and lack of expenditure tracking processes were found to inhibit implementing quality improvement plans.

Conclusion/Discussion

Nigeria's BHCPF program is implementing a quality improvement process that aligns quality assessments results with direct facility financing via business plans to enable the implementation of quality improvement interventions. By tracking expenditures as well, program implementers can determine the pathway by which direct facility funding is leading to quality improvement and identify approaches to optimize the use of direct facility financing and resource gaps that increased financing could address. However, in practice, facility leadership requires additional financial and technical support for the QI cycle to demonstrate how direct facility financing and insurance capitation payments can lead to improved quality.

3:30 PM –5:00 PM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Executive Room 1

Maternal Health and Anaemia

MODERATOR: **Evans Otieku**,

Ind-1978 Cost-Effectiveness of Expanded HIV Screening in Pregnant Women: A Systematic Review and Meta-Analysis

PRESENTER: **Qing HE**
AUTHORS: ZhinXin Fan, Qiang Sun, Jia Yin

OBJECTIVES: Globally, the response to human immunodeficiency virus (HIV) is improving, but not fast enough to end the acquired immunodeficiency syndrome (AIDS) as a public health threat by 2030. Early detection and intervention of people living with HIV/AIDS is critical from both clinical and public health perspectives. Screening is the gateway to the prevention of mother-to-child transmission of HIV. Cost-effectiveness analyses are essential to effectively inform policy makers and consequently implement valuable screening strategies. This study aimed to evaluate the economic value of expanded HIV screening strategy in pregnant woman to support evidence-based decision making, especially in low-and middle-income countries (LMICs) where economic evidence is limited. METHODS: PubMed, Embase, Web of Science, and Medline were searched from January 1990 to December 2022. Language was limited in English. Studies were included if they were cost-effectiveness or cost-utility analyses of expanded HIV screening strategy in pregnant women. The incremental cost-effectiveness ratios (ICERs) and incremental net benefits (INBs) were calculated and then pooled across studies, stratified by economic level of the country, maternal HIV prevalence in the study, using a random-effect model. If the ICER was below the prespecified threshold of willingness to pay (WTP) or the INB was a positive value, the expanded HIV screening would be considered cost-effective according to the recommendation. Literature quality was assessed using the Consolidated Health Economic Evaluation Reporting Standards (CHEERS) 2022 checklist and Quality of Health Economics Studies (QHES). RESULTS: Fourteen studies involving 446,654,352 target population were included in the meta-analysis. Expanded HIV screening strategy was cost-effective in LMICs with the pooled ICER of $101.22 (95%CI: $92.70-$109.74) as well as the pooled INB of $2322.80 (95% CI: $2086.98-$2558.63), but not cost-effective in high-income countries (HICs) with a pooled INB of -$85,983.23 (95% CI: -$117536.91 to -$54429.55). Subgroup analyses also revealed that expanded prenatal HIV screening was a cost-effective strategy for HICs under the study scenarios with relatively high HIV maternal prevalence (>0.1%). High heterogeneity was observed across included studies (I2 > 99% and P < 0.001). CONCLUSIONS: The complex epidemiological context of the different regions calls for sustained efforts to eliminate vertical HIV transmission. As the primary but resource-intensive intervention, HIV screening plays an important role in reducing the rate of new infections and facilitating prompt access to treatment, thereby achieving effective control of the epidemic. The findings suggest that expanded antenatal screening service is a cost-effective and important strategy, particularly for LMICs, to boost the sustainability of the region's HIV response and contribute to the goal of 'ending AIDS by 2030'. Although structured interventions referring to HIV testing and treatment are well described, and antenatal care packages are widely recommended, utilization of these services remains suboptimal in many LMIC settings. Further research and pilot programs are needed to guide future planning, implementation and scale-up.

Ind-2818 Cost-Benefit Analysis of Expanding Doula Coverage Among Medicaid Enrollees in the United States

PRESENTER: **Donald S. Shepard**, Brandeis University
AUTHORS: Ilhom Akobirshoev, Monika Mitra

Background The United States continues to face significant challenges in maternal health outcomes, including cesarean delivery and preterm birth, compared to other high-income countries. Recent evidence demonstrates doula care services significantly reduce cesarean deliveries (RR=0.53; 95% CI=0.43-0.66) and preterm births (RR=0.71; 95% CI=0.51-0.98). While several states have implemented Medicaid coverage for doula services, the economic implications of scaling up doula care services remain unknown. **Objectives** To evaluate the economic implications and potential cost savings of incrementally scaling up doula care service coverage to 80% for Medicaid-enrolled birthing people across the United States. **Methods** We conducted a cost-benefit analysis using propensity score-matched risk ratios from a recent multi-state study of doula care among Medicaid enrollees. We modeled the scaling up of doula care services in 10% increments to 80% coverage. Costs were adjusted to 2024 dollars using medical care CPI. State-specific analyses were conducted for the five largest Medicaid birth volume states. We also performed sensitivity analyses using input ranges based on published literature. **Results** At 80% coverage, projected annual net savings were $338.4 million per 100,000 births (95% CI: $285.7M-$391.1M), with a return on investment of $3.52 per dollar invested. State-specific analyses showed potential annual savings ranging from $243.6 million (Illinois) to $758.0 million (California). Sensitivity analyses demonstrated cost savings under various assumptions. **Discussion** Expanding doula care services through Medicaid is a cost-effective strategy with a significant return on investment. Even under conservative assumptions, including full implementation costs, the doula care intervention demonstrates substantial cost savings. The phased implementation approach allows for sustainable program growth while building workforce capacity. **Implications for Health Policy** This analysis provides economic justification for expanding Medicaid coverage of doula care services, potentially preventing approximately 15,600 cesarean deliveries and 2,800 preterm births per 100,000 births while generating substantial healthcare savings. **Keywords**: Economic evaluation, maternal health, doula care, Medicaid, implementation science

Ind-1899 Cost-effectiveness of Intravenous Iron Sucrose for Treating Anemia in Pregnancy

PRESENTER: **Deepshikha Sharma**, Postgraduate Institute of Medical Education and Research
AUTHORS: Arun Kumar Aggarwal, Pankaj Bahuguna, Shankar Prinja, Neelam Aggarwal

Background: Anemia is among the most prevalent nutritional deficiencies affecting pregnant women, often resulting in adverse maternal and fetal outcomes, thereby posing a significant public health challenge. While oral iron supplementation has traditionally been the primary intervention, its effectiveness is often limited by issues related to compliance and absorption. Intravenous iron sucrose has emerged as a promising alternative; however, its cost-effectiveness remains unexplored. This study aims to evaluate the cost-effectiveness of intravenous iron sucrose compared to oral iron in moderately anemic pregnant women in India. **Methods:** A decision-tree model was developed to estimate the costs and outcomes associated with anemia in pregnancy for both maternal and fetal/newborn populations over a lifetime horizon. The analysis adopted an abridged societal perspective, accounting for direct medical and non-medical costs related to anemia treatment and its complications. Indirect costs from productivity losses were considered in the sensitivity analysis. A 3% discount rate was used to adjust future costs and outcomes. Deterministic and probabilistic sensitivity analyses were conducted to assess the robustness of the findings **Results:** Intravenous iron sucrose had an incremental cost-effectiveness ratio (ICER) of INR 30,397 per disability-adjusted life year (DALY) averted and INR 7,489 per quality-adjusted life year (QALY) gained. These ICERs are below the threshold of 1-times GDP per-capita, indicating that intravenous iron sucrose is cost-effective. Sensitivity analyses showed that the ICER was not significantly impacted by variation in key model parameters, and the estimates consistently remained below the cost-effectiveness threshold of 1-times GDP per-capita, except in extreme scenarios where oral iron compliance exceeded 75% or intravenous compliance fell below 35%, rendering the intervention as not cost-effective.

Conclusion: Intravenous iron sucrose is a cost-effective strategy for managing moderate anemia in pregnancy compared to oral iron and should be prioritized as first-line therapy. Improving treatment adherence is essential for optimizing outcomes, emphasizing the need for targeted interventions to enhance compliance.

Ind-548 A New Approach to Target Setting in Global Health using Cost-Effectiveness Analysis: An Example of the SDGs Target for Anaemia

PRESENTER: **Robin Blythe**
AUTHORS: Natalie Carvalho, Michael Bode, Jacinta Holloway-Brown, Tori Oliver, Sant-Rayn Pasricha, Sumie Leung

Background

In 2015, the United Nations (UN) Sustainable Development Goals (SDGs) set a target to halve the prevalence of anaemia in women of reproductive age by 2030. However, it is questionable whether this goal is achievable for most countries, with nearly all expected to fall short. Overly ambitious and globally uniform targets may be intended to be aspirational, but can risk overwhelming healthcare systems in low- and middle-income countries with many competing priorities and limited resources. An alternative approach to target setting is through the use of cost-effectiveness analysis to inform individual national targets, which can be aggregated to obtain achievable, cost-effective global health targets.

Study aim

In this study, we present a cost-effectiveness analysis of World Health Organisation-approved interventions for anaemia for 192 UN member nations, and use these findings to generate national and global anaemia reduction targets.

Methods

We obtained prevalence estimates from Global Burden of Disease data for mild, moderate and severe anaemia in women aged 15 to 49 for 192 UN member nations. Using costs and effectiveness estimates from published literature, we developed a decision analytic model in R to simulate the expected costs and reductions in disability-adjusted life years (DALYs) from a health system perspective for each country. Cost-effectiveness for each intervention was calculated incrementally after simulating the delivery of each proposed treatment, selected by expected incremental cost-effectiveness ratio and determining whether to apply the treatment using an empirical willingness-to-pay threshold. We considered a range of thresholds, including recently estimated opportunity-cost based approaches. Uncertainty was propagated through the model using Monte Carlo simulation.

Results

Under an empirical willingness-to-pay threshold, the median estimated achievable reduction in anaemia prevalence was 36.3% [95% interval: 26.4%, 42.2%], with 3000 [719, 15014] DALYs averted. There was a large spread of maximum possible reductions, with 14 of 192 countries theoretically able to achieve a 50% reduction in anaemia by applying all cost-effective interventions, while many sub-Saharan African countries were able to achieve reductions of under 12%.

Conclusions

Using health economic analysis, we show that the achievable reduction in anaemia prevalence for women of reproductive age varies substantially by country, with many low- and middle-income countries likely unable to achieve the target set by the UN SDGs. Our alternative approach can be applied to other global health targets, potentially allowing more realistic planning and expectations among UN member nations.

3:30 PM –5:00 PM MONDAY [Health Care Financing & Expenditures]

Bali International Convention Centre – Singaraja

Payment Models and Provider Incentives

MODERATOR: **Michal Horný**,

Ind-741 General Practitioners Remuneration and Impact on Patients' Health, Health Care Use and Mortality

PRESENTER: **Kjartan Sarheim Anthun**, SINTEF
Background and aim General practitioner (GP) organisation and remuneration have been studied for some years (Scott&Hall 1995; Flodgren et al 2011; Abelsen&Olsen 2012; Barham & Milliken 2015; Brekke et al 2020; Skovsgaard et al 2023). Since differences in remuneration are often invariant within a health system, and endogeneity is a concern, there is a gap in knowledge regarding the effects of remuneration that could be addressed by well-designed studies. This study aims to examine the impact of remuneration schemes on the treatment decisions of GPs in Norway. We compare two distinct schemes employed in Norway: one involving independent physicians compensated by municipalities through a combination of capitation and fee-for-service, and another where physicians are employed and salaried. The comparison is complicated by the fact that municipalities and GPs may select their funding scheme, potentially with differences in patient populations. To mitigate this endogeneity, we analyse GPs transitioning between remuneration schemes and instances of random patient assignment to GPs with differing funding structures. By assessing patients on a GP's list before and after a transition, we evaluate the effects on

patient outcomes. Additionally, we match patients exposed to funding changes with those who were not, allowing us to estimate effects that are less prone to confounding. This approach will yield significant health economic insights into how GPs' remuneration influences patient health, healthcare utilization, and mortality. **Methods and approach** We employ a difference-in-differences design to analyse changes over time. The treated group includes patients whose GPs underwent a funding scheme change, while the control group consists of patients with GPs that did not. By comparing outcome trends between these groups, we can estimate the effects of the funding changes. We also match across groups (on age, sex, immigrant background, GP age, GP list size, and follow-up duration) to control for confounding factors. To prevent spill-over effects, we ensured that matched GPs did not practice in the same municipality. We use Poisson regression with high-dimensional fixed effects to compare outcome rate changes within the matched groups. **Current status and results** To conduct our analysis, we utilize data from multiple complete Norwegian registries covering all health care use and all GPs. Our primary outcomes are a) contacts and costs with primary care physicians, b) contacts and costs with acute hospital services in somatic and mental health specialist care, and c) rate of deaths per year during the follow-up period. Preliminary results indicate mixed results.

Ind-936 Healthcare Providers Preferences for Capitation Payment Method Under Universal Health Insurance in Tanzania: A Discrete Choice Experiment

PRESENTER: **Francis Donard Ngadaya**
AUTHORS: Josephine Borghi, John Joseph Maiba, Gemini Mtei, Timothy Powell-Jackson, Peter Binyaruka

Background: Tanzania is designing and preparing the implementation plan for the Universal Health Insurance (UHI) as means to achieve universal health coverage goals. Since resources are limited, UHI scheme should purchase health services strategically by incentivising efficient and better quality of care. Provider payment methods (PPMs) are critical component of healthcare purchasing reform. Fee for services is less efficient compared to capitation which offers opportunities for cost containment and efficiecy, but its success depends on the design which incorporate elements to reduce predicted negative provider behaviours under capitation. Other key approach is to align the capitation attributes with providers preferences to ensure acceptability and smooth implementation. To inform the capitation design and implementation for UHI, we conducted a Discrete Choice Experiment (DCE) to understand the most preferred capitation and implementation attributes among primary healthcare providers, estimated trade-offs for willingness to accept, preference heterogeneity, and policy option simulations.

Methods: We conducted a DCE survey with 240 primary healthcare providers, preferably facility in-charges, from 84 facilities in Singida and Manyara regions in Tanzania. The DCE used five capitation attributes: adequacy of payment amount, service to be covered, payment schedule, additional payment for high performing facilities and timeliness of payment, each with different levels. Capitation attributes and levels were identified through a literature review and qualitative research, which were refined and reduced through expert opinions and pilot test. We used a D-efficient design and coefficients from pilot study (n=28) to generate two blocks, each with forced 12 unllabelled choice sets of two hypothetical payment methods (capitation A and B). Mixed multinomial and conditional logit models will be used to estimate the main effects, followed by more flexible mixed MNL models to explore the preference heterogeneity, trade-offs for willingness to accept and policy option simulations.

Results: While the results are forthcoming, we expect to estimate the main effects showing the most preferred attributes based on how they influence providers' choices. Pilot result shows higher preferences for timely payments, adequacy of payment amount, and service covered. Results on willingness to accept will be presented, for example, how much provider value an increase in performance-based allocation relative to other categorical attributes. Various scenarios will be accounted to simulate how different capitation attributes impact provider uptake. Lastly, preference heterogeneity will show how preferences for capitation attributes vary based on facility and health worker characteristics.

Conclusion: The findings will provide evidence-based insights into the design of capitation payment method for UHI by aligning with healthcare providers preferences, and ensuring their acceptance for smooth implementation in Tanzania.

Keywords: Capitation, Universal Health Insurance, Healthcare provider, DCE, Tanzania

Ind-493 How Do the Incentives for Family Physicians Affect the Implementation of Family Physician Contract Service Policy in China? A Qualitative Study

PRESENTER: **Jia Tang**
AUTHOR: Rize Jing

This study explores how financial and non-financial incentives impact the implementation of the Family Physician Contract Service (FPCS) policy in China. Employing a qualitative approach, we conducted semi-structured interviews with 36 participants, including local health commission directors, leaders of primary healthcare facilities, family physicians, and nurses, across eight community health centers in four cities known for their advanced FPCS implementations. The data were analyzed using the framework method, which provided critical insights into the effectiveness of various incentive structures within the FPCS policy. The findings reveal that financial incentives, particularly patient-based capitation fees, play a central role in motivating family physicians to fulfill their contractual obligations. The capitation fee, when representing a substantial portion of overall income, aligns physicians' financial interests with the policy's goals by fostering better patient engagement and continuity of care. However, the study identifies significant regional variations in the implementation of these fees, with some cities failing to establish this essential component, thereby undermining physician motivation and the policy's effectiveness. Moreover, the method of distributing capitation fees—whether independently or mixed with performance-based pay—substantially affects their impact. Independent distribution was found to enhance transparency and directly link compensation with workload, reinforcing the principle of "more pay for more work." A critical challenge identified in the financing models, particularly those solely reliant on health insurance, is the risk of adverse selection. Family physicians in these models tend to prefer contracting with healthier patients to minimize costs, thereby neglecting individuals with severe health conditions. This study proposes an innovative solution: differentiated capitation fees based on patient health status, which incentivize physicians to engage with a broader and more diverse patient population, mitigating adverse selection risks. Non-financial incentives, including authority delegation, enhanced work relationships, and opportunities for professional growth, were also found to

be pivotal. The establishment of self-governing family physician studios, as observed in Shanghai, fosters autonomy and collaborative teamwork, boosting job satisfaction and performance. Strengthened peer and patient relationships further motivate physicians, creating a supportive work environment conducive to the long-term success of the FPCS program. Additionally, professional development opportunities and recognition through appraisal-linked incentives contribute to a heightened sense of self-identification and achievement among family physicians. This study makes a novel contribution by integrating qualitative insights with policy implications, addressing both financial and non-financial dimensions of incentive structures within the FPCS framework. It underscores the necessity of a balanced and context-specific approach to incentive design, advocating for policies that not only enhance financial compensation but also promote professional autonomy and growth. The findings offer actionable recommendations for optimizing FPCS implementation, particularly in regions with varying levels of healthcare infrastructure and administrative support. **Key words:** Family physicians; Incentives; Patient-based capitation; Authority delegation.

Ind-880 The Impact of Different Payment Systems on Medical Services in Public Hospitals: Evidence From a Multi-Pilot City in China

PRESENTER: **Yifan Yao**
AUTHORS: Yingbei Xiong, Li Xiang

Objective: To evaluate the effect of various payment systems, including Diagnosis-Related Groups-Prospective Payment System (DRG-PPS), Diagnosis-Related Groups under Regional Global Budget System (DRG-GBS), and Diagnosis-Intervention Packet under Regional Global Budget System (DIP-GBS), on cost and quality of healthcare in public hospitals.

Methods: The study was conducted in one of China's most economically developed regions, characterized by abundant medical resources and extensive patient data. The dataset included 9,297,452 inpatient records from 64 public hospitals in the city and aggregated at the hospital level. Among them, 9 tertiary hospitals implemented the DRG payment model, while 55 hospitals adopted the DIP model. This retrospective observational study analyzed data from all public hospitals in the study city between January 2018 and August 2023. The study periods were defined as follows: before DRG-PPS (January 2018-December 2018), during DRG-PPS (January 2019-December 2020), during DRG-GBS (January 2021-August 2023); before DIP-GBS (January 2018-February 2020), and during DIP-GBS (March 2020-August 2023). To assess the impact of different payment systems on public hospital services, we analyzed costs, cost composition and quality. Outcome variables include total cost as well as medication cost, consumables cost, diagnostic and laboratory test cost, and surgical cost. For each cost component, we examined its proportion of the total cost. For healthcare quality, the outcome variables include length of stay (LOS), hospital infection rate, and clinical pathway compliance rate. We conducted an interrupted time series (ITS) analysis to examine the impact on above-mentioned outcome variables before and after the implementation of DRG and DIP reforms.

Results Total cost remained unchanged under DRG-PPS but decreased under DRG-GBS (-$18.78, 95% CI, –37.08 to –0.49) and DIP-GBS (-$23.47, 95% CI, –34.05 to –12.90). LOS remained stable under DRG-PPS and DRG-GBS, but slightly decreased under DIP-GBS (–0.04 days, 95% CI, –0.07 to 0.00). Infection rates declined after DRG-PPS (-0.02% per month, 95% CI, –0.04 to 0.00) and DIP-GBS (-0.01% per month, 95% CI, –0.02 to 0.00). Clinical pathway compliance rate remained stable under DRG-PPS and DIP-GBS but declined under DRG-GBS (–0.34% per month; 95% CI, –0.70 to 0.02). Medication cost declined under DIP-GBS (-$5.21, 95% CI, –8.30 to –2.11), while consumables cost decreased under both DRG-GBS and DIP-GBS. The proportion of diagnostic and laboratory test cost increased under both DRG-GBS and DIP-GBS. Surgical costs decreased after DRG-GBS and DIP-GBS by $3.29 (95% CI, –5.65 to –0.93) and $2.79 (95% CI, –4.12 to –1.46), respectively. The results of subgroup analysis showed that the effects of DIP-GBS in tertiary hospitals were consistent with the overall results, while most outcome changes in non-tertiary hospitals were not significant.

Conclusion Findings suggest that the same DRG model produced different outcomes under different budget modes (GBS vs PPS), whereas DRG and DIP showed similar effects within the same budget mode (GBS). In China's dual-track payment system, rather than focusing on which grouping methods is superior, efforts should prioritize quality monitoring and improving hospital adaptability to ensure high-quality care under value-based payment systems.

Ind-894 Is Reducing Cost Variation Among Hospitals Achievable Through Case-Based Payment Reform? Insights From Cerebral Infarction in China

PRESENTER: **Shiting Liu**
AUTHORS: Yining Wang, Xiaohua Ying, Xinyu Zhang, Haifeng Ma

Objective: Case-based payment systems are widely implemented in inpatient care to improve service efficiency, provider coordination, and equitable access. Cerebral infarction (CI), with its high healthcare costs and significant disease burden, has been a key focus of quality control and clinical guidelines. This study evaluates whether a case-based payment reform introduced in 2018 in a developed city in southern China incentivized providers to reduce cost variation for CI.

Method: We analyzed patient discharge records from 2016 to 2022. Cost variation was measured using the interquartile range (IQR) and coefficients of variation (CV) based on aggregated hospital-level adjusted average costs. Inflation was adjusted using the city's consumer price index (CPI), and case-mix adjustments were made. An interrupted time series (ITS) model was employed to examine the impact of the reform on IQR and CV across hospitals, stratified by hospital level (tertiary and secondary) and treatment group (surgical, medical). A second breakpoint at Q1 2020 was introduced to account for the potential effects of COVID-19, as an alternative to explore short-term impacts.

Results: A total of 64,615 patients from 91 institutions were included before the reform, and 228,640 patients from 175 institutions afterward. All hospitals demonstrated a significant immediate reduction in the CV and IQR of adjusted total costs, with CV decreasing by 0.137 and IQR by 1,315 CNY ($P < 0.05$), followed by negligible post-reform quarterly trend changes (-0.001 for CV, -103 CNY for IQR). Similar patterns were observed in both secondary and tertiary hospitals, with secondary hospitals showing a more pronounced effect. Medical and surgical

groups also experienced immediate reductions in CV post-reform, with declines of 0.101 and 0.022, respectively. The surgical group exhibited a negative quarterly trend change of 0.012 across all hospitals. IQR followed similar patterns, with negative post-reform trend changes in surgical groups for secondary (-3,655 CNY) and tertiary hospitals (-407 CNY). Short-term effects were more pronounced, with CV and surgical group CV showing significant quarterly trend changes of -0.004 and -0.043 ($P < 0.05$), respectively.

Conclusion: The implementation of the DIP payment reform led to a significant short-term reduction in cost variation, though some inconsistencies were observed across hospital levels and treatment groups. Under the reform, secondary hospitals and the surgery group exhibited more substantial reductions in cost variation. Compared with tertiary hospitals, secondary hospitals may have been more strongly incentivized to reduce costs under benchmark competition to mitigate potential financial risks. The notable reduction in cost variation within the surgery group further suggests that overuse of costly treatments was prevalent prior to the reform.

Keywords: prospective payment, DIP, Cerebral infarction, hospital-level cost variation，the interquartile range，coefficients of variation, benchmark, competition, surgical group

Ind-373 The Effect of Amount of Tariff in Incentivizing Vaginal Deliveries in Primary Healthcare under the Indonesia National Health Insurance

PRESENTER: **Febriansyah Budi Pratama**
AUTHORS: Mutia Astrini Pratiwi, Merry Lusiana, Ratu Martiningsih, Hasbullah Thabrany, Iko Safika

Do Higher Tariffs Encourage Normal Deliveries in Primary Care? Evidence from Indonesia's National Health Insurance

Background.
Indonesia's National Health Insurance (JKN) covers childbirth services at both primary healthcare facilities (PHCs) and hospitals, with reimbursement tariffs designed to incentivize normal deliveries at PHCs. However, under previous tariffs, the share of normal deliveries at PHCs declined from 45% in 2015 to 30% in 2022, while more expensive hospital-based deliveries, especially caesarean sections (SCs), accounted for up to 45% of total deliveries. In response, the Ministry of Health implemented a policy in 2023 to increase PHC delivery tariffs by 14.3%–57.9%, depending on clinical conditions, while hospital tariffs remained relatively unchanged. Concurrently, clinical requirements for PHC deliveries were tightened, including increasing the personnel requirement from four to six hands. This study evaluates whether the 2023 tariff adjustment effectively shifted childbirth utilization patterns toward PHCs.

Methods.
We used a mixed-methods approach. The quantitative component employed fixed-effects regression using district-level panel data from JKN claims (2019–2023), controlling for the number of active JKN members, availability of PHCs and referral hospitals, and regional differences (Java-Bali vs. other regions). The qualitative component included focus group discussions (FGDs) and spot checks in six districts across Java, Sumatra, Kalimantan, and Sulawesi, involving 10 Puskesmas, 4 private clinics, and 1 type-D Pratama Hospital.

Results.
The tariff increase **did not result in a higher proportion of normal deliveries at PHCs**. On the contrary, regression analysis shows a statistically significant **decrease in normal deliveries at PHCs** following the policy (Coef. = –0.036, SE = 0.008, $p < 0.001$). The change in the proportion of normal deliveries at referral hospitals was also negative but statistically insignificant in the full model (Coef. = –0.014, SE = 0.010). Meanwhile, **the proportion of SC deliveries increased significantly** (Coef. = 0.049, SE = 0.010, $p < 0.001$). A placebo test using 2022 as a pseudo-policy year showed no significant effect, supporting the validity of the causal inference.

Qualitative findings identified several implementation barriers that may have offset the intended effect of the tariff increase. These include additional administrative burdens (e.g., mandatory congenital hypothyroid screening), limited logistics and provider availability at PHCs (especially outside Java-Bali), unclear clinical guidelines for basic emergency obstetric care, and the introduction of the six-hands requirement, which reduces the feasibility of midwife-led services in low-resource settings.

Conclusion.
The 2023 tariff adjustment has **not achieved its intended goal** of incentivizing normal deliveries at PHCs. Financial incentives alone were insufficient to overcome **structural, regulatory, and operational constraints** at the frontline level. To improve effectiveness, policymakers should revise implementation guidelines, align tariffs with PHC service delivery capacity, and consider making PHC tariffs equivalent to hospital tariffs. Additionally, exploring cost-sharing mechanisms for SC deliveries may help manage provider- and patient-side moral hazard and promote more appropriate, equitable use of maternal health services. Further analysis using 2024 claims data is needed to explore behavioral drivers behind SC overuse.

Ind-2010 Unlocking Access: Overcoming Barriers and Harnessing Enablers for Innovative Payment Models for Pharmaceutical Innovation in Europe

PRESENTER: **Matthias Hofer**
AUTHORS: Sian Hodgson, Brittany Darrow, Mikel Berdud, Amanda Cole, Mireia Jofre-Bonet

Background: Simple price discounts for pharmaceuticals have been identified as not providing sufficient solutions to many existing patient access challenges. Innovative payment models (IPMs), successfully implemented in several European countries, have facilitated access to pharmaceutical innovations. However, their implementation faces significant barriers, which can delay and/or increase the burden of implementing agreements and, in some cases, prevent their adoption entirely. At the same time, key enablers have facilitated the use of IPM and improved the ease of implementation.

Aim: In this research, we used qualitative methods to identify and gain consensus on the main barriers and enablers for implementing IPMs in Europe with the aim to share best practices for all European stakeholders and facilitate the generation of solutions and policy recommendations.

Methods: We used a two-phase qualitative approach. In the first phase, we conducted a survey to collect individual input on the most relevant pricing and payment methods, barriers and enablers to implementation, and potential solutions for better implementation practices. The survey was distributed to a wide range of expert stakeholders including payers, HTA bodies, healthcare commissioners, policymakers, regulators, industry representatives, data infrastructure experts, providers, and patient representatives. The experts were from 9 European countries selected according to a taxonomy that considered geography, GDP and health expenditure per capita, primary health financing system, and IPM experience. In the second phase, we conducted a nominal group roundtable with a purposive sub-set of survey respondents to reflect on both commonalities and differences of opinion arising from the survey and focus on creating consensus on the barriers and enablers of IPMs. In addition, we elicited experience-based knowledge from the participants to inform recommendations that will guide a flexible application of different models in real life.

Results: Experts highlighted the need for international collaboration to share best practices to improve the readiness of all stakeholders to implement IPMs. The study identified key barriers and enablers to the implementation of IPMs in Europe. Identified barriers included administrative burden associated with both developing and operationalising agreements, misalignment of stakeholders' priorities, challenges in achieving agreement on the terms of the IPM, IPM operationalising conflicts with legal, regulatory and administrative frameworks, and lack of data or data-gathering infrastructure to monitor and evaluate IPM performance. Conversely, enablers that facilitated successful IPM implementation included investment in expertise and infrastructure for implementing and managing IPMs (e.g. centralised data repositories), early and transparent dialogue among stakeholders to align goals and expectations, and adaptive frameworks that allowed iterative refinements of agreements.

Conclusion: The findings highlight that while innovative payment models hold significant potential to improve patient access to pharmaceutical innovations, their implementation is hindered by diverse barriers. Key enablers, such as robust data systems, adaptive agreements, and stakeholder collaboration, are critical for overcoming these challenges. This research underscores the importance of understanding the common challenges experienced in the implementation of IPMs, so that international cooperation can help to inform solutions and recommendations for all stakeholders. This will enable the creation of an environment where IPMs can be sustainably adopted across Europe.

Ind-927 Impacts of Policies in Controlling Growth of Medical Expenses in China, 2010-2019

PRESENTER: **Xuechen Xiong**
AUTHORS: Jianchao Quan, Zhaohua Huo, Li Luo

Background Addressing the surge in medical expenses is a primary focus of Chinese healthcare reform. The annual growth rate of total health expenditure was 12.4% in 2019, surpassing the national GDP growth rate of 6.0%. A series of nationwide policies have been implemented to control the unreasonable growth of medical expenses in public hospitals, including enhancing financial support for healthcare facilities, adjusting service pricing of medical treatments, and implementing a zero-mark-up policy for medications. However, the effectiveness of these measures in controlling growth of medical expenses is unknown. **Objectives** To evaluate the impact of increased financial support for healthcare facilities, adjusted service pricing, and the zero-mark-up policy on curbing the growth of medical expenses in public hospitals in China from 2010 to 2019. **Methods** We utilized system dynamics theory to model the capital flow of hospitals. We analyzed the growth of medical expenses by considering: 1) the population growth and aging, 2) changes in disease spectrum and modern lifestyle, and 3) induced services provided by doctors. Data collection was facilitated by the Shanghai Municipal Health and Health Commission, providing information on public hospital expenditures, human resources, and health services. **Results** Population and disease changes are the primary drivers of medical cost growth in Shanghai, contributing to approximately 51% of the overall increase in medical expenses in public hospitals over the past decade. Induced costs have also played a significant role, accounting for around 36% of the rise in medical expenses. While the zero-mark-up policy does not impact total hospital funds or induced expenses, it does alter the distribution of capital flows. The medical service price adjustment policy reduced the proportion of induced costs by 3%, and increased fiscal investment reduced it by 8%. The comprehensive implementation of all three policies led to an 11% decrease in medical expense growth. **Conclusion** Comparing the three policies, solely implementing the zero-mark-up policy does not directly address induced costs. The fiscal investment policy shows better effectiveness in controlling growth of medical expenses compared to the service price adjustment policy. **Keywords:** public hospitals, medical expenses, induced cost, national policy

Ind-2083 Reducing Fragmentation in Financing for Health Through Joint Planning, Implementation, and Monitoring: A Case Study From Blantyre, Malawi

PRESENTER: **Dalitso Laviwa**
AUTHORS: Loncy Sajeni, Stephanie Heung, Briony Pasipanodya, Chimwemwe Pinto, Chrissy Chilenje, Mihereteab Teshome, Eoghan Brady, Gift Kawalazira, Andrews Gunda

Background:

Malawi’s health sector relies heavily on donor funding, with 55% of the health budget supported by 166 financing sources. This has led to fragmented funding, reduced resource efficiency, and limited partner alignment to government plans. To address these issues, Malawi’s Ministry of Health launched the Health Sector Strategic Plan III (HSSP III) for 2023–2030, focusing on the “One Plan, One Budget, One Report” reform to improve aid alignment.

Blantyre District Council in Malawi is committed to operationalizing the “One Plan, One Budget, One Report” reform and has implemented a

joint planning, implementation, and monitoring initiative since 2019, with technical support from the Clinton Health Access Initiative (CHAI). This initiative builds district planning capacity, aligns partner activities with government plans, supports Technical Working Groups (TWGs) to secure funds for unfunded activities, and strengthens monitoring tools to enhance accountability between government and partners.

Research Questions and Methods:

In 2024, an evaluation was conducted by the Blantyre District Council and CHAI to assess the effectiveness of joint planning, implementation, and monitoring in improving aid alignment from 2019–2024. This evaluation used a mixed-methods approach, including (1) a time-series analysis of the proportion of implementing partners with activities included in district plans, (2) calculating funding generated through TWGs, and (3) the percentage of planned activities implemented by government and partners. This was complemented by qualitative insights from focus group discussions with government staff and implementing partners on the effectiveness of the joint planning, implementation, and monitoring approaches.

Results:

The evaluation found that government staff and implementing partners were generally proficient in using planning and partner mapping tools. The proportion of implementing partners integrating their planned activities into district plans increased from 5% in financial year (FY) 2018/2019 to 34% in FY 2022/2023. Both government and implementing partners reported that partner mapping reduced duplication of activities and improved coordination among stakeholders.

The TWG meetings enabled stakeholders to address implementation challenges and raise funds, mobilizing over USD 240,602 from implementing partners against a cost of USD 5,653 to run the TWG meetings, yielding a very high return on investment of 43X. The funds supported the implementation of 7% of previously unfunded activities. Furthermore, the participants noted the monitoring tool's value in real-time tracking of activity implementation, which showed an increase in the implementation of government-funded activities from 40% in 2019 to 52% in 2024, and in partner-funded activities from 76% to 95% in the same period, due to the joint planning and implementation approaches including TWGs.

However, government participants noted that progress on aid alignment is hindered by the lack of enforceable sanctions for non-compliance with aid alignment guidelines. .

Conclusions/Implications:

The evaluation concludes that the initiative effectively improved aid alignment in Blantyre. To ensure sustained impact, the central government should establish enforceable guidelines for donor and partner alignment with government priorities, potentially including sanctions for non-compliance. This will further strengthen aid alignment, which is critical in a fiscally constrained context where planning and budgeting functions are increasingly devolved to districts and health facilities.

Ind-1373 Understanding the Cost of Illness Among National Health Insurance Dropouts in Ghana

PRESENTER: **Jacob Novignon**, Kwame Nkrumah University of Science and Technology
AUTHOR: Caleb Osei

Introduction

Ghana's National Health Insurance Scheme (NHIS) is taunted as a crucial policy effort towards universal health coverage (UHC) through financial protection for health care. The scheme covers over 50% of the population and more than 90% of diseases presented at health facilities across the country. The scheme has however faced several challenges affecting effective operation for both providers and subscribers. One of such challenges is subscription non-renewal or dropout. This challenge has the potential to undermine progress made towards UHC if not addressed. Previous studies have provided a wide range of reasons explain subscriber dropout while others have assessed its economic inequalities. This study takes a step further to understand the health care cost burden for NHIS dropouts who sought care for their illness. We also assessed the equity implications of the estimated cost burden.

Methods

We used data from the seventh round of the Ghana Living Standards Survey (GLSS 7) conducted in 2016/2017. The survey is the country's largest income and expenditure survey that collects data on a wide range of expenditure components including health. The survey also asks respondents about their NHIS subscription history allowing us to identify individuals who were previously subscribers but not anymore. Among these NHIS dropouts, we sampled individuals who had the need to seek health care from formal sources and extracted all out-of-pocket costs related to this healthcare seeking. For each individual, the cost of care was computed as a sum of payments on drugs, consultation, diagnostics and inpatient care. To access the cost burden, we computed its proportion of the household budget share using a 10% threshold. The distribution of the cost burden was analyzed using concentration indices (CI).

Results

The findings reveal that on average, NHIS dropouts spent about GHC84.20 on health care. This amount is substantially higher than the annual cost of NHIS subscription. The health care cost burden for the dropouts was higher among urban dwellers (GHC104) and middle-aged individuals (GHC106.38). On average, about 0.17% of these NHIS dropouts spent more than 10% of their budget share on health care, pushing about 0.5% into poverty. Furthermore, we found that the catastrophic health spending that resulted from NHIS dropout was concentrated among individuals from economically disadvantaged households [CI = -0.614] and more prevalent in rural [CI = -0.749] than in urban [CI = -0.461]

locations.

Conclusion

The findings provide evidence that support efforts to address NHIS dropout in Ghana. In the spirit of leaving no one behind while achieving the UHC targets, our results show that it is important to keep existing subscribers on the scheme while coverage expansion efforts are pursued. Interventions to address this include reducing subscription travel and waiting time in line with current efforts to adopt digital subscription renewal strategies.

3:30 PM –5:00 PM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Nusantara 1

Economic Analysis in Novel Areas

MODERATOR: **James Buchanan**,

Ind-627 Cost-Effectiveness of Whole Genome Sequencing in Patients with Tuberculosis in China

PRESENTER: **Yibei He**
AUTHOR: Yan Li

Abstract

Background. China is a high-burden tuberculosis (TB) country and delays in diagnosis and effective treatment have further exacerbated this situation. Whole genome sequencing (WGS) has been proven to be a reliable testing strategy for TB drug-susceptibility testing (DST). However, the cost-effectiveness of applying WGS for routine TB diagnosis in China is still unknown.

Method. Using a decision tree-Markov model, we assessed the cost-effectiveness and health impact of using a WGS-based strategy for TB DST compared to culture-based testing and other rapid molecular testing strategies from a societal perspective. The model simulated 10,000 patients with active TB over their lifetime. Model inputs, including transition probabilities, health utilities, direct and indirect costs, sensitivity, and specificity for each strategy, were derived from the Global TB Report 2023, Chinese Center for Disease Control and Prevention, expert opinion, and the literature. Costs and health utilities were discounted at 5% per year.

Results. In the base case analysis, WGS, Xpert, and Xpert Ultra were cost-saving for patients with active TB. Compared to the culture-based DST, the pooled incremental net monetary benefit (INMB) for Xpert, Xpert Ultra, and WGS were $1750.06, $1832.84, and $1939.32, respectively. Over the lifetime, WGS is the optimal DST strategy for TB patients in China, which could save $401.83 in direct medical costs per person, while gaining an additional 0.121 quality-adjusted life years (QALYs) per case and reducing TB mortality by 45 per 10,000 patients. Sensitivity analyses suggest that the cost-effectiveness finding was robust.

Conclusions. WGS-based technology for TB DST could save more medical costs and lead to increased QALY gains compared to other strategies. Findings from this economic evaluation indicate that policymakers should encourage the widespread adoption of WGS for TB DST in China to ensure that all TB patients receive prompt diagnosis and effective treatment.

Ind-1141 Cost-Effectiveness and Equity Impact of Genomic Newborn Screening for Duchenne's Muscular Dystrophy

PRESENTER: **Anagha Killedar**, University of Sydney
AUTHORS: Joanne Scarfe, Sarah Norris, Didu Kariyawasam, Kirsten Howard, Winnie Chen, Michelle Farrar

Background: The introduction of genomics to newborn bloodspot screening (NBS) programs is being considered in several countries including the United States, the United Kingdom and Australia. In Australia, NBS programs could be expanded from screening for ~50 genetic conditions using predominantly biochemical approaches to hundreds of conditions using molecular methods including genome sequencing. While such expansion would allow earlier detection and management of many additional conditions it may introduce, exacerbate, or reduce health inequities. In Australia, the Medical Services Advisory Committee is responsible for considering the safety, effectiveness and cost-effectiveness of population screening programs, including NBS, however, the health technology assessment approach used does not consider equity impacts in any technical way. **Research Aim:** The study's aim was to develop a health economic model for genomic NBS that can be used to explore cost-effectiveness and equity impacts using Duchenne Muscular Dystrophy (DMD) as a case study. DMD is a condition with substantial health, social and economic impacts for the child and family and is ideal for exploring the equity impacts of genomic NBS. **Methods:** A Markov microsimulation model for DMD was constructed, informed by clinical expertise and published literature. Inputs will be updated with primary data from an Australian pilot of NBS for DMD and linked administrative data. The base model incorporates impacts on healthcare costs and quality of life. Further benefits include access to disability services, and benefits to family (eg, reproductive planning). Equity impacts are examined by using individual-level simulation to project the distribution of costs and benefits of genomic NBS for DMD across a birth cohort over a 50 year time horizon, corresponding to the maximum life expectancy of a person with DMD. The analysis accounts for disparities in a range of inputs, such as screening uptake, across several equity variables (e.g. socioeconomic position, ethnicity, geographical location). To quantify equity impact, relevant inequality indices are calculated in "no screening" and "screening" scenarios, across the whole newborn cohort and within the DMD cohort. Cost-effectiveness is calculated using standard approaches. **Results:** Preliminary analysis indicates that genomic

NBS for DMD may not be cost-effective, from a healthcare perspective, in the context of currently available management options. Due to low prevalence, there is minimal impact on inequalities in quality-adjusted life years (QALYs) in the whole cohort of newborns. However, within those with DMD, the impact on both univariate and bivariate inequalities in QALYs are observable under several scenarios. When incorporating a socioeconomic gradient in screening uptake (between 50-99%), screening resulted in the slope index of inequality increasing by 2 QALYs and the relative index of inequality by 11%. The health Gini index, representing univariate inequality, increased by 0.002. **Conclusions:** The model demonstrates how the cost-effectiveness and equity impact of genomic NBS for rare conditions, such as DMD, can be considered together. With several equity variables of interest, and methods to present equity impact, further work is needed to determine the appropriate approach to presenting these results to inform decision-making.

Ind-506 Cost-Effectiveness Analysis of Robotic-Assisted Thoracoscopic Surgery versus Video-Assisted Thoracoscopic Surgery for Early Stage NSCLC in China

PRESENTER: **Tianfu Gao**

AUTHORS: Hongtao Wang, Juntao Dong

Ind-585 Cost-Utility Analysis of NeuroSAFE Versus Standard Robotic? Assisted Radical Prostatectomy in Men With Localized Prostate Cancer

PRESENTER: **Jiunn Wang**, University of Exeter

AUTHORS: Elena Pizzo, Greg Shaw, Ricardo Almeida?Magana, Nick Roberts, Eoin Dinneen, Chris Brew-Graves, Pan Shengning, Baptiste Leurent, Norman Williams

Background

Robotic radical prostatectomy (RARP) is a first-line curative treatment option for localized prostate cancer. Erectile dysfunction and urinary incontinence are common associated adverse side effects that can affect patients after surgery. Preserving the lateral neurovascular bundles (NS) during RARP improves functional outcomes. The NeuroSAFE technique (intraoperative frozen section examination of the neurovascular structure adjacent prostate margin) can provide real-time pathological consult to promote optimal NS whilst avoiding PSM. NeuroSAFE PROOF is a single-blinded, multi-centre, randomised controlled trial (RCT) in which men are randomly allocated to either NeuroSAFE RARP or standard RARP.

Aim

The aim of this study is to assess the cost-utility of NeuroSAFE RARP alongside RARP compared to standard RARP using both the NHS and societal perspectives.

Methods

A within trial economic evaluation has been conducted using data from the NeuroSAFE trial. The cost of the intervention and control has been assessed using data on the consumption of healthcare resources (inpatient and outpatient visits, medications etc.) at patient level collected during the trial at different time points. The costs have been assessed using the unit cost data available from the published sources (BNF, PSSRU, NHS tariffs). Outcomes have been measured in terms of erectile function, incontinence and quality of life measured through EQ5D5L questionnaires. The results are expressed in terms of Incremental Cost Effectiveness Ratio and Net Monetary Benefits. Extensive sensitivity analysis has been performed to test the robustness of the results.

Initial results and conclusions

The trial has randomised 407 patients in total. Preliminary results show that the NeuroSAFE intervention is more expensive compared to standard treatment but improve outcomes in patients, reducing incontinence and quality of life. Therefore the intervention is cost-effective and should be approved as a standard treatment by the NHS. ## **Conclusions** NeuroSAFE PROOF is the first RCT of intra-operative frozen section during radical prostatectomy in the world. It is properly powered to evaluate a difference in the recovery of EF for men undergoing RARP assessed by patient-reported outcome measures. It will provide evidence to guide the use of the NeuroSAFE technique around the world.

Ind-1259 AI-based Digital Chest X-ray a Cost-effective Intervention for Active Case Finding (ACF) for TB in India

PRESENTER: **Dr. Samraj Sahay**

Background Under National Tuberculosis Elimination Programme (NTEP), India aims at eliminating TB by the year 2025, five years ahead of the SDG Target with reduction in incidence by 80% and mortality by 90%. The decline has been far from the set targets. One of the reasons is the low rate of active case findings (ACF), particularly in the high-risk groups such as tribal population. This study tries to examine the cost-effectiveness of alternative strategies for enhancing the ACF and subsequent reduction in adverse outcome; TB incidence and mortality, using strategy 1: mobile AI-based chest X-ray (CXR) and strategy 2: inclusion of informal health providers (IHPs) to bring in more presumptive TB patients for testing to the mobile AI-based CXR facility as compared to the existing strategy which uses mobile digital CXR with interpretation of the CXR by radiographers back at the peripheral health institutes (PHIs) resulting in considerable turnaround time and subsequent low ACF. **Method** The paper uses a Markov model for a 1-year cycle to estimate the costs and quality adjusted life expectancy (QALY) to determine the cost-effectiveness of the two alternative strategies using AI-based CXR as compared to the existing strategy for a tribal district from the provider perspective. The cost of the strategies included the cost of using the mobile AI-based CXR for strategy 1 and cost of involving the IHPs in terms of the incentives paid to them per presumptive cases (INR 50) and confirmed cases (additional INR 250) for strategy 2. The Markov model consisted of five states – healthy, active-TB, recovered, death due to disease and death due to background reasons. Data for the costs and rates used for the probabilities in the model was taken from published literature. A one-way sensitivity analysis was carried to confirm the robustness of the findings. **Results** The findings suggest that strategy 2 resulted in more gain in health outcome

(21.25 QALYs) as compared to status-quo (21.14). The incremental cost-effectiveness ratio (ICER) for strategy 2 was US$ 4940.92 per QALY gained whereas strategy 1 was weakly dominated by strategy 2. ICER is less than 1.75 times per capita GDP and well below the threshold of 3 times. The sensitivity analysis showed that the model is most sensitive to the relative risk reduction in probabilities of TB related mortality. The findings confirmed the cost-effectiveness of strategy 2 as compared to the existing strategy and can be the preferred choice for implementation. **Conclusions** The analysis finds that AI-based CXR has greater benefits*** in avoiding the adverse health outcome for TB in India than using mobile CXR with manual interpretation currently in practice. The benefits further increase when supplemented with services of IHPs as this increases the ACF and the subsequent reduction in TB related mortality. To achieve the NTEP targets, a decision should be made in favour of including services of IHPs in addition to increasing the number of AI-Based Mobile CXR, particularly in tribal areas.

Ind-1966 A Comparative Cost Analysis of First-Line Chronic Lymphocytic Leukaemia Treatment Regimens From a Public Healthcare System Perspective

PRESENTER: **Wen Yuen Lim**
AUTHORS: Niamh Appleby, Sarah Wordsworth

Background: The development of new B-cell targeted treatments in chronic lymphocytic leukaemia (CLL) and refined molecular diagnostics offer an effective model for precision medicine, but at a high price. There remains uncertainty surrounding the optimal and most cost-effective therapy in terms of both choice and duration. Published health economic studies have been mainly conducted in insurance-based healthcare systems, using projection models. There are limited studies that evaluate the real-world cost implications of the two main frontline CLL treatment strategies: continuous acalabrutinib, an exclusively oral targeted treatment, and venetoclax-obinutuzumab (VenO), a combination of intravenous monoclonal antibody and oral targeted treatment for a total fixed duration of 48 weeks. The study was conducted from a publicly funded healthcare system perspective which is under-represented in the literature. The aim of the study was to provide early health economic evidence to support healthcare providers in determining the best-value option for patients and to test an easily reproducible method for quantifying costs.

Methods: The study utilised a hybrid approach in the costing methods. Microcosting techniques were used to calculate drug costs, including systemic anticancer treatments and supportive medications. Healthcare resource groups or tariffs were used to estimate healthcare resource use (HRU) costs, as the healthcare currency within the National Health Service in the United Kingdom ("case-mix group" approach), which were subsequently categorised for sub-analysis. 40 patients starting their first CLL treatment in Oxford University Hospitals between September 2020-March 2022 were identified (24 acalabrutinib, 16 VenO). Data for two years of treatment-related costs incurred in a hospital setting was included in the analysis, which encompassed one year off-treatment for the VenO cohort. Statistical analysis was undertaken to test for significance between groups. A deterministic sensitivity analysis was performed to establish the impact of key variables. A literature review was conducted to appraise health economics publications comparing newer CLL treatment regimens.

Results: The mean total costs in Year 1 are higher for VenO compared to acalabrutinib (£104,255 vs £69,942) but reversed in Year 2 (£1,855 vs £53,984). 2-year overall treatment costs for acalabrutinib are £17,873 higher than VenO, with 89% attributed to drug costs. Recent studies supported this finding, establishing the significant health economic impact of therapy costs and improved patient survival with comorbidities. Deterministic sensitivity analysis showed that a reduction in drug costs had the biggest economic impact. 53.1% of HRU costs in the acalabrutinib group were attributed to unplanned activities such as hospital admissions, compared to 37.4% for VenO, but there were no statistically significant differences detected between groups for each of the HRU categories.

Conclusion: This study adds to the evidence base on the economic impact of fixed-duration versus continuous frontline CLL regimens in a centrally funded healthcare system. Head-to-head comparisons are required to establish long-term efficacy and cost-effectiveness of treatments. Genomic strategies to identify patients likely to experience durable disease control and guide duration of treatment are being explored to optimise healthcare resources while improving health outcomes, which could reduce overall healthcare expenditure, although global access to genomic testing may remain restricted.

abs-os87 23 and (not Just) Me: Incorporating Family Members in Economic Evaluation of Genetic and Genomic Testing Technologies

PRESENTER: **Wendy J Ungar**, The Hospital for Sick Children Research Institute/University of Toronto, Toronto, Canada
Background: The theoretical foundation of economic evaluation espouses welfarism that considers benefits from a new technology to **all** members of society. This contrasts with economic evaluation guidelines which focus on patients. This disconnect is amplified for genetic/genomic tests as these technologies routinely incorporate family members in testing and medical management of a genetic diagnosis. While economic evaluation guidelines increasingly recognize productivity costs of family members designated as patient caregivers, they lack a framework for incorporating other costs and health benefits to family members from a new technology. The objective is to illustrate the impact of incorporating family members on the design and conduct of economic evaluation of genetic/genomic testing technologies through studies of: 1) the cost-effectiveness of trio (child patient and two biological parents) genome sequencing (GS) vs. trio exome sequencing (ES) in pediatric rare disease and 2), cascade genetic testing in children with cardiomyopathy. *Methods:* A cost-effectiveness analysis of trio GS vs. ES was conducted whereby trios were randomly assigned to receive either GS or ES stratified by phenotype and molecular testing history. The cost per trio for GS and for ES testing were determined using micro-costing based on laboratory workflow and sequencing-related inputs. A probabilistic analysis was performed to address parameter uncertainty. Effectiveness was expressed as diagnostic yield (rates of diagnostic or partially diagnostic variants detected). Incremental costs and incremental effectiveness were calculated. The second example demonstrates conceptually how a positive finding in a pediatric cardiomyopathy patient leads to cascade testing in family members and referrals for treatment and surveillance. *Results:* The total cost per trio was CAD 4364 (95% CI: 3985, 5014) for GS (n=324) and CAD 2889 (95% CI: 2568, 3493) for ES (n=329). The incremental cost for GS compared to ES was CAD 1472. The diagnostic yield was 32.7% (106/324) for GS and 35.9% (118/329) for ES. Capturing upstream laboratory costs and effectiveness in a three-person household is seamless and easily executed. Modeling downstream costs expressed as referrals of family members for further testing, surveillance and treatment requires integrated forms of data collection facilitated by e-health records and linked datasets. Determining distal health outcomes in family members can be achieved through

modeling that captures health states for multiple family members and reports results and incremental effects at the family level. *Conclusions:* Genome sequencing and other 'omics tests are costly technologies diffusing rapidly into medical genetics and sub-specialties such as oncology and pediatrics. It's essential that standard medical practices involving family member testing, surveillance and treatment are reflected in economic models evaluating their cost-effectiveness. Burgeoning research on spillover effects can be leveraged to provide insight into how health resource use and health outcomes in family members can be captured through the inclusion of parent health states, parent-child dyad health states and household welfare function models. Measuring the costs and health consequences of genetic testing technologies in family members is integral to understanding the value of emerging sequencing technologies to fully inform funding and adoption decisions.

Bali International Convention Centre – Denpasar A

Outcome Measurement and Valuation in Health and Wellbeing

MODERATOR: **Mária Mercédesz Angyal**, Semmelweis University of Budapest

Ind-484 Assessing Caregiver Quality-of-Life Using EQ-5D-5L for Children Suffering from Developmental and Epileptic Encephalopathy in Australia.

PRESENTER: **Hansoo Kiim**
AUTHORS: Arun Jones, Jeremy Welton, Melinda Spencer

Background:

Developmental and Epileptic Encephalopathies (DEEs) are the most severe form of epilepsy, typically associated with frequent and severe seizures, and comorbidities including intellectual disability, behavioural abnormality, autism spectrum disorder and sleep disturbances. With an onset typically in infancy, patients with DEEs typically require life-long care, placing an immense burden on caregivers and family. As such, providing care for patients with DEEs can have a substantial impact on quality-of-life (QoL) and overall wellbeing.

Aim:

The aim of this study was to assess the impact of caring for a person with DEEs on the QoL of caregivers in Australia, including their financial situations, work and life activities, and mental and physical health status.

Methods:

This research used a cross-sectional study design. An online survey was designed and distributed to Epilepsy Foundation, Epilepsy Action Australia, Epilepsy Queensland and Epilepsy WA through the web-based survey tool, Qualtrics Core XM. Validated survey instruments were employed to measure the impact of caregiving responsibilities on their health-related quality-of-life (EQ-5D-5L), depression severity (Beck Depression Index; BDI) and sleep quality (Pittsburgh Sleep Quality Index; PSQI), as well as general demographic questions such as age, gender and the disease characteristics of the person being cared for with DEE. This study received ethics approval from the Griffith University Human Research Ethics Committee (reference number 2024/396). All participants provided informed consent to the research and to publication of the results.

Results:

A total of 32 caregivers completed the online survey. Most respondents were female (93.1%) and the mean age of caregivers was 44.2 years (SD=6.23 years). Mean EQ-5D was 0.79 which is substantially lower than the population mean of 0.86 (population mean for females aged 35-44 is 0.84). Respondents who had a change in job situation (e.g. changed jobs, reduced hours, quit etc) reported an EQ-5D utility of 0.77 compared to 0.96 ($p<0.05$) for those who did not have a change in job situation. The EQ-5D also varied according to the BDI scale with respondents reporting BDI = 'Minimal' reporting lower EQ-5D values vs respondents with BDI = 'Severe' (0.95 vs 0.67, $p=0.064$). The mean PSQI was reported to be 16.1 (SD=3.14) with all the respondents reporting a PSQI score <5 (=poor sleep quality).

Conclusions:

Our results suggest that carers of patients suffering from DEEs have substantially reduced QoL as measured by the EQ-5D-5L when compared to the general population (0.79 vs 0.86). Factors that seem to be influencing this is poor sleep quality as measured by the PSQI and mental health problems as measured by the BDI.

Our evidence-based evaluation will help establish a standard way of assessing the disease burden of the caregivers in Australian settings. The results of this work will also be helpful for the design of prospective/pragmatic studies to evaluate the broader societal value of interventions for DEEs based on improvements in productivity and QoL for caregivers. The information provided through this survey will be valuable to policymakers and clinical decision-makers in understanding the burden of DEE for caregivers.

Ind-487 Changes in Health-Related Quality of Life and Inequality in China: Evidence from a Nationwide Repeated Cross-Section Survey (2021-2023)

PRESENTER: **Xiaodan Zhang**
AUTHORS: Qiang Yao, Siyuan Fan, Yibo Wu, Chaojie Liu

Objectives: Health improvement is a multidimensional process that requires a focus on both health levels and equity. Existing research on health outcomes often lacks a comprehensive approach that integrates these dimensions, especially regarding HRQoL trends impacted by the COVID-19 pandemic. This study analyzed nationwide trends in the levels and equality of health-related quality of life (HRQoL) among Chinese residents during the COVID-19 pandemic (2021–2023). ***Methods:*** Data were sourced from the Psychology and Behavior Investigation of Chinese Residents (PBICR) survey, with 9,963 participants in 2021, 28,280 in 2022, and 45,003 in 2023. HRQoL was measured using the EQ-5D-5L, examining changes in the weighted utility index (UI) and visual analogue scale (VAS) scores. Ordinary least squares (OLS) regression models assessed the changes in UI and VAS scores over time, controlling for variations in other variables. Inequality in UI and VAS scores was quantified using the Erreygers Index (EI), and contributors to EI scores were identified through RIF-EI-OLS decomposition models. ***Results:*** The highest weighted UI score (0.9363±0.1389) was observed in 2021, which declined to 0.9332 (SD=0.1524) in 2022 (β=-0.0081, P<0.0001) and to 0.9244 (SD=0.1546) in 2023 (β=-0.0143, P<0.0001). The EI value decreased from 0.0703 in 2021 to 0.0635 in 2022 (β=-0.0105, P<0.001), with no further significant change in 2023. Regional disparities in both UI and EI were evident. Higher socioeconomic status (e.g., income, education, employment) correlated with higher UI and lower EI scores, while chronic conditions and comorbidity were linked to lower UI and higher EI scores, respectively. Higher social support, healthier lifestyles, increased health literacy, and an improved home environment were associated with higher UI and lower EI scores. The VAS results mirrored those of the UI. ***Conclusions:*** During the COVID-19 pandemic, HRQoL among residents of mainland China exhibited a downward trend with increasing pro-rich inequality. This trend is likely influenced by multiple factors across individual, family, and societal levels. The findings underscore the need to address income and regional disparities in HRQoL that were exacerbated by the pandemic, highlighting the importance of targeted investments in education, labor participation, and mental health support. These insights offer valuable guidance for tailoring clinical interventions and shaping policy decisions in China and other regions facing similar health inequality challenges. ***Key words:*** Health-related quality of life, HRQoL, China, Health inequality

Ind-563 Health-Related Quality of Life and Influencing Factors of Adult Patients With Spinal Muscular Atrophy

PRESENTER: **Lei Dou**

Background: Spinal muscular atrophy (SMA) is an infrequent yet progressive neuromuscular disorder predominantly attributed to homozygous deletions or mutations in the survival motor neuron 1 (SMN1) gene. This genetic anomaly leads to progressive proximal muscle weakness and atrophy. Beyond its detrimental impact on motor neurons, SMA adversely influences the functionality of various tissues, thereby restricting daily activities, elevating perceived fatigue, and diminishing health-related quality of life (HRQoL). Adults constitute 35% of individuals diagnosed with SMA. With the progression of supportive care and the introduction of disease-modifying treatments (DMTs), this proportion is anticipated to rise. Adult SMA patients encounter distinct health challenges compared to their pediatric counterparts, including the demands of daily activities, employment, and social engagement. However, previous studies have mainly focused on pediatric patients, and there has been limited research on health-related quality of life in adults with SMA. The aim of this study was to assess the HRQoL among adult patients with SMA and to investigate the factors influencing HRQoL. **Methods:** A cross-sectional study was undertaken in May 2023. Patients with SMA were recruited from the Beijing Meier Advocacy & Support Center for SMA (Meier), a non-profit organization specializing in SMA. The inclusion criteria required participants to have a confirmed diagnosis of SMA, be 18 years of age or older, and express willingness to participate in the study. Individuals unable to independently complete the questionnaires were excluded from the study. Ultimately, 202 adult patients with SMA completed the survey. The EQ-5D-5L instrument was employed to evaluate HRQoL of the participants. Additionally, the SMA independence scale (SMAIS) and fatigue severity scale (FSS) were utilized to assess daily activity capabilities and perceived fatigue, respectively. Data on socio-demographics variables, disease-specific characteristics, and treatment status were collected via a self-administered questionnaire. Descriptive statistical analysis and Tobit regression modeling were applied for data analysis. **Results**:** The mean health state utility (HSU) score for the EQ-5D-5L was 0.26 (SD = 0.33), while the mean scores for the SMAIS and FSS were 26.73 (SD = 14.47) and 5.47 (SD = 1.23), respectively. Among adult patients, the EQ-5D-5L dimension most frequently associated with problems was usual activity, followed by mobility. In terms of the SMAIS results, patients experienced the greatest difficulty with dressing independently. Factors influencing patients' HRQoL included current motor function, changes in motor function, dysfunction, comorbidities, self-reported severity, treatment status, FSS scores, and SMAIS scores. **Conclusion:** Adult patients with SMA demonstrate a significantly lower HRQoL compared to the general population in China and report experiencing severe perceived fatigue. To enhance the HRQoL of adult SMA patients, it is imperative to focus on individuals who are non-ambulatory, exhibit progressive motor function decline, present with multiple dysfunctions or comorbidities, experience greater disease severity, are currently untreated, report heightened fatigue, and possess diminished capacity to engage in daily activities.

Ind-569 Meaningfulness Of Health Gains - Implications for Economics Evaluations

PRESENTER: **Ana Bobinac**, University of Rijeka, Faculity of Economic and Business, Center for Health economics and Pharmacoeconomics
AUTHOR: Ismar Velic

Innovative therapies often come with exorbitant costs, raising critical questions about their value relative to the health benefits they provide. This paper examines the concept of **Minimum Effectiveness Threshold (MET)**, addressing whether public resources should be allocated to therapies that yield minimal health gains. Traditional cost-effectiveness analyses, typically represented by Incremental Cost-Effectiveness Ratios (ICERs), assess whether a therapy's cost is justified by its health benefits, usually measured in Quality-Adjusted Life Years (QALYs). However, these analyses often fail to consider whether the health gains are meaningful to patients and society at large.

The investigation begins with a review of existing literature on the efficacy of innovative cancer therapies approved by regulatory bodies such as the European Medicines Agency and the U.S. Food and Drug Administration. Studies indicate that many newly approved therapies offer only marginal improvements in overall survival (OS), with median survival gains often ranging from just a few weeks to several months. For instance, a systematic evaluation revealed that only 35% of oncology indications from 2009 to 2013 demonstrated significant OS benefits. Furthermore, recent analyses have shown a disconnect between the high costs of cancer drugs and their actual therapeutic benefits, suggesting that pricing is often dictated by market dynamics rather than clinical efficacy. The paper highlights the societal implications of funding marginally effective treatments. It posits that policymakers, healthcare providers, and patients may struggle to accept limitations in treatment options, leading them to favor therapies that offer even slight improvements in survival. This inclination is fueled by a desire for hope and the perception that every possible treatment avenue should be explored, particularly in cases involving rare diseases or high unmet medical needs. To address these concerns, the authors propose establishing explicit MET criteria for evaluating new oncology treatments. By defining a minimum threshold for meaningful health gains—such as, for instance, an additional three to six months of survival—healthcare systems could prioritize funding for therapies that deliver substantial benefits over those that provide only marginal improvements.

The paper presents findings from an empirical study conducted in Croatia, where public representatives were surveyed about their perceptions of meaningful health gains. Results indicated that citizens do not consider all health improvements as equally valuable; rather, they emphasize the significance of both the magnitude and duration of health gains. We argue that integrating MET into reimbursement frameworks could enhance decision-making processes in healthcare resource allocation. By aligning funding decisions with societal preferences regarding meaningful clinical benefits, healthcare systems could better manage limited resources while ensuring that patients receive treatments that genuinely enhance their quality of life. By advocating for a more nuanced approach to evaluating health gains—one that considers both cost-effectiveness and meaningfulness— we might achieve a more equitable and efficient allocation of healthcare resources, ultimately benefiting patients and society as a whole.

Ind-809 Have we been Measuring Migrant Wellbeing all Wrong? Conceptualizing Migrant Wellbeing: A Systematic Review

PRESENTER: **Salsawi Feleke Debela**
AUTHORS: Sheenagh McShane, Lauren Carpenter, Celia McMichael, Ankur Singh, Karen Block

Background: We are living in the "age of migration". Many migrants, especially those forcibly displaced, face challenges impacting their lives, livelihood and wellbeing. Wellbeing is a widely used concept. It is broadly defined as the quality of life. However, it lacks a universal definition, standardized measurement and even spelling. At present, there are over a thousand different wellbeing measurement tools. For migrants, positive subjective wellbeing signals successful settlement, healthy functioning, and social integration. However, most research has focused on mental illness, overlooking subjective wellbeing, which is a crucial quality of life indicator. Existing wellbeing measures are often based on Western, middle-income cultural norms, limiting their relevance for studying ethnic and immigrant populations. Aim: To date, no systematic reviews have evaluated the properties, suitability, and appropriateness of current wellbeing measurement tools for migrant populations. This review sought to address this gap. It aimed to understand how the wellbeing of people who migrate from low/middle-income countries to middle/high-income countries has been conceptualized, defined, and measured. Methods: A systematic search was run in four databases: MEDLINE, PubMed, EMBASE, and PsycINFO. This produced 5,610 articles. Two independent researchers screened all the articles, leaving 126 articles for the final analysis. Two types of analysis were used: narrative synthesis and COSMIN analysis. Key results: The 126 articles measured the well-being of migrants using 43 different wellbeing measurement tools and covered more than 281,400 migrants, aged 15 to 79+, who live in more than 35 countries. Defining wellbeing is fundamental to measuring it. However, more than 70% of studies included in this review did not define or conceptualise wellbeing. Seven tools were identified as being used most commonly to measure migrant wellbeing although two of these tools were not designed to measure well-being. Except two of the tools (PWI and WHOQoL-BREF), most other tools did not have satisfactory scores when evaluated using COSMIN. Four out of the six tools lack cross-cultural validity. Less than half of the studies reported translating wellbeing measurement tools into respondents' languages. Furthermore, no tool was specifically designed to measure migrants' wellbeing. It is likely that tools designed, developed and tested in Western high-income contexts may overlook culturally significant elements essential to migrants. Implications: The lack of cultural validity in most of the commonly used tools raises an important concern about their ability to accurately measure the wellbeing of migrants. For policy makers, the findings of this review call into question the accuracy of the information they rely on to make policy-based decisions. Hence, assigning adequate resources to design migrant specific wellbeing measure is of paramount importance. Conclusions: The findings of this review call for a shift in the way we assess wellbeing in migrant populations and highlights critical gaps in the current wellbeing measurement tools used for migrant populations. Without culturally informed tools, our understanding of migrant wellbeing will remain fragmented, limiting our ability to develop effective interventions and policies. As migration continues to shape global demographics, the development of such tools is crucial to ensure equitable and effective public health intervention.

Ind-996 The Distribution of Quality-Adjusted Life Expectancy by Level of Socioeconomic Disadvantage and Remoteness Area for the Australian Population

PRESENTER: **Sheridan Rodda**
AUTHORS: Richard Norman, Zanfina Ademi, Jedidiah Morton, Melanie Lloyd

Background

Socioeconomic status (SES) is associated with significant health inequalities in Australia and globally. Methods for evaluating the equity impacts of a healthcare funding decision alongside cost-effectiveness are emerging. These equity-informed analyses require the baseline distribution of health across relevant equity subgroups against which interventions may be evaluated. The distribution of health status measured as quality-adjusted life expectancy (QALE), by socioeconomic status is unknown for Australia.

Aim

To estimate QALE, across SES groups, stratified by sex and year of age for the Australian population.

Methods

A cross-sectional study combining nationally representative datasets was conducted. SES was measured using two area-level measures: the 2021 Socio-Economic Indexes for Areas Index of Relative Socioeconomic Disadvantage (IRSD) which assigns areas a score measuring socioeconomic disadvantage, we used quintiles ranging from quintile 1 (Q1) for those most socioeconomically disadvantaged to quintile 5 (Q5) for those least disadvantaged); and the remoteness area for the individual's place of residence based on the Australian Statistical Geography Standard using three categories: major cities, inner regional and outer regional to very remote.

National mortality data for 2022 from the Australian Bureau of Statistics was used to construct life tables to estimate life expectancy (LE). Short form (SF-36) responses from Wave 22 (2022) of the Household, Income and Labour Dynamics in Australia survey were used to estimate the mean SF-6D (version 1) health utility by age, sex and SES using specific linear regression models.

Health utility was integrated into the life tables by multiplying the person years lived by utility index estimates to determine the QALE for each sex-SES group. Probabilistic sensitivity analysis derived 95% confidence intervals for the estimates and 3% discounting was applied.

Results

Mean health utility was higher for males than females and decreased with age. From birth, undiscounted LE for all individuals in Q1 (most disadvantaged), was 78.7 years compared to 86.3 years for those in Q5 (least disadvantaged). Incorporating health-related quality of life amplified these disparities, with those in Q1 experiencing an undiscounted QALE of 43.9 (95% confidence interval 42.6-45.2) years compared to 55.6 (54.1-57.1) years for Q5, representing a 27% relative difference in QALE. There was a modest equity gradient by remoteness with individuals in major cities expecting a LE of 83.1 years and QALE of 50.8 (49.8-51.7) years (all undiscounted) while those in outer regional to remote areas expecting a LE of 80.5 years and QALE of 47.0 (44.2-49.7) years.

Conclusion

There is clear disparity in QALE by socioeconomic status in Australia, whereby both the quantity and quality of life decrease with increasing socioeconomic disadvantage and geographical remoteness. These findings highlight the need for targeted interventions to address health inequalities. The detailed QALE estimates produced can be applied to equity-informative economic evaluations.

Ind-1028 Comparison of Psychometric Performance of Self-Complete and Proxy Versions of the Bangla EQ-5D-Y-3L and Socio-Economic Factors Influencing Agreement

PRESENTER: **Marufa Sultana**, Deakin University
AUTHORS: Jahangir AM Khan, Mimmi Åström, Rumana Huque, Sayem Ahmed, Md Badruddin Saify, Ms. Lisa Gold

Background

Assessing health-related quality of life (HRQoL) in children is essential for understanding healthcare needs and directing resource allocation. The EQ-5D-Y-3L is a widely used instrument designed to measure the health status of children. The instrument comprises five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression, each with three response levels (no problem, some problems, a lot of problems). It also includes a visual analogue scale (VAS) ranging from 0 to 100. Both the self-complete and proxy versions of the EQ-5D-Y-3L were translated into Bangla and pilot-tested in Bangladesh for the first time. This study aimed to compare the psychometric properties of self-complete and proxy versions, agreement between versions and socio-economic factors influencing agreement.

Methods

The study recruited children aged 8-18 years attending public schools and their parents from one urban and one rural district in Bangladesh. The EQ-5D-Y-3L was administered to children/adolescents (self-report) and to parents/caregivers (proxy report) with a few additional open-ended questions. Parents also completed a demographic and socio-economic questionnaire. Data were evaluated on several parameters: response rate, completion time, ceiling effects, reliability, and validity. Agreement between self-report and proxy responses was assessed using the Prevalence-Adjusted and Bias-Adjusted Kappa (PABAK), which ranges from 0 to 1, with values ≥0.70 considered strong agreement. Convergent validity was assessed through Spearman's correlation coefficients (ranging from 0 to 1, with higher values indicating stronger correlation). Multivariable logistic regression identified predictors influencing agreement, including variables such as location, age, gender, income, occupation, and school grade. A P-value <0.05 was considered the significance level, and results were reported as odds ratios (ORs) with 95% confidence intervals (95% CI).

Results

240 parent-child dyads participated, with mean ages of 37.5 years for parents and 13.1 years for children; 52% were from urban areas. The mean completion time was similar for both self-complete and proxy versions (5.1 and 5.2 minutes), with no missing responses. Most children/adolescents (96%) and parents/caregivers (78%) found the tool easy or very easy to complete (P=0.339). 48% of self-reports and 58% of proxy reports indicated no problems across all dimensions (11111), reflecting relatively low ceiling effect for self-report with non-significant difference (P-value=0.366). Agreement was highest for mobility and looking after myself dimensions (PABAK≥0.70) and lowest for pain/

discomfort (PABAK=0.10). Similarly, test-retest reliability from a sub-sample demonstrated strong agreement for mobility and looking after myself dimensions (PABAK=0.92) but low for pain/discomfort (PABAK=0.06). Mean VAS scores were 86.8 for self-reports and 88.6 for proxy reports, with weak convergent validity (Spearman's Rho=0.18). Adjusted logistic regression analysis indicated higher agreement among rural residents (OR: 2.0; 95% CI: 1.4–7.3) and middle-income participants (OR: 3.9; 95% CI: 1.8–20.6). No significant associations were identified for other variables.

Conclusions

The Bangla self-complete and proxy versions of the EQ-5D-Y-3L demonstrated feasibility and moderate agreement for measuring HRQoL among children in Bangladesh. Further research with larger samples is recommended to apply the versions across diverse groups.

Ind-1086 Using Expert Elicitation to Estimate Lifetime Overall and Progression-Free Survival in Idiopathic Pulmonary Fibrosis in Indonesia

PRESENTER: **Wayan Citra Wulan Sucipta Putri**
AUTHORS: Arie Rahadi, Fariz Nurwidya, Lusiana Siti Masytoh, Arini Purwono, Sita Laksmi Andarini

Background: Unified disease registries in a local setting are the most valid data source to inform long-term patient survival of the existing, baseline standard of care in an economic evaluation. However, in Indonesia such registries are not always available due to fragmentation in health data infrastructure, making reliable collection of real-world survival data too costly. To overcome this barrier in our economic evaluation of antifibrotic agents for idiopathic pulmonary fibrosis (IPF), a rare disease with an onset in older age, we elicited expert opinions to construct baseline survival, anchored to data on published cohort. **Methods:** The process was conducted in 3 phases: preparation, elicitation and aggregation. In the preparation phase we identified outcomes (overall survival [OS] and progression-free survival [PFS]) and the elicitation method (fixed interval). For elicitation, we invited experts who were six pulmonologists with recent experience in treating IPF to participate in an elicitation exercise on survival parameters in October 2024. During the first stage of elicitation, experts were presented OS and PFS curves from the EMPIRE cohort and asked to individually modify the survival probabilities in six semiannual intervals up to 36 months to approximate their beliefs on observed rates in their practice settings, using pre-programmed spreadsheet templates. In the second stage, the expert-constructed survival curves were aggregated in a Delphi method to consensus values that were acceptable to all experts. Lifetime extrapolation by parametric distribution was applied, and the results were optionally calibrated to an expected value informed by consensus. **Results:** Three experts participated in the exercise. The expert-constructed survival curves were lower than the reference EMPIRE cohort, with gaps that were visually larger with time for OS, proportional throughout 36 months for PFS, and variable by experts. The consensus vs. EMPIRE survival probabilities at 12, 24, and 36 months were 69.9% vs. 77.3%, 42.8 vs. 58.3%, and 24.4% for OS; and 48.9% vs. 54.2%, 19.8% vs. 30.6%, and 7.2% vs. 14.5% for PFS. Exponential and Weibull distributions provided the best fit to the data on OS and PFS probabilities, respectively, by the Akaike/Bayesian information criteria. When reviewing the extrapolated survival, experts agreed to calibrate the 60-month OS to 11% so that the probability of being alive beyond 15 years was approximately zero. No calibration was desired for extrapolated PFS. Post-exercise surveys indicated that all experts valued their direct engagement in the elicitation technique and highly preferred reaching a consensus in the second stage compared to the 'averaging out' of individual estimates had the technique stopped after the first stage. **Conclusions:** Consensus-based, participatory expert elicitation can be valuable to overcome data constraints in Indonesia and give credence to the parameter estimates used in a cost-effectiveness analysis of antifibrotic agents for IPF. Better planning to include more experts in future endeavors is needed to improve the reliability of this elicitation technique. Keywords: Expert elicitation; economic evaluation; calibration; idiopathic pulmonary fibrosis; low- and middle-income countries

Ind-1255 Trend and Health Inequality of Burden of Cardiovascular Disease From 1990 to 2021: Evidence From Global Burden of Disease Study 2021

PRESENTER: **Xing Chen**
AUTHORS: Wen Chen, Luying Zhang

Objective Cardiovascular disease (CVD) is a significant public health issue globally. This study aims to quantify the global burden and trends of CVD while also analyzing inequalities from geographic, gender, and socioeconomic perspectives. **Methods** The estimates and 95 % uncertainty intervals (UI) for prevalence, disability-adjusted life-years (DALY), and mortality of CVD were extracted from Global Burden of Diseases, Injuries, and Risk Factors Study (GBD) 2021. We compared global differences and trends in the burden of CVD across three dimensions: geography, gender, and age group. Additionally, we quantified cross-country inequalities in the burden of CVD using standard health equity methods recommended by the World Health Organization. **Results** In 2021, the global age-standardized prevalence of cardiovascular disease was 7,178.7 per 100,000 population (95% uncertainty interval: 6,696.2 to 7,620.7). The age-standardized DALY rate was 5,055.86 (4,759.6 to 5,359.2), and the age-standardized mortality rate was 235.2 (214.6 to 250.5). At the regional level, North Africa and Middle East exhibited the highest age-standardized prevalence rate at 9,882.7 (9,335.5 to 10,467.5). Oceania had the highest age-standardized DALY rate at 9,114.9 (7,689.5 to 10,553.8), while Central Asia recorded the highest age-standardized death rate at 436.1 (395.8 to 474.5). By gender, the global gender ratios (male to female) for the age-standardized DALY rate and death rate were 1.52 (1.52 to 1.55) and 1.43 (1.41 to 1.48), respectively. Notably, this gender disparity has been increasing since 1990. Regarding age groups, the prevalence, DALY, and mortality rates associated with cardiovascular disease continue to rise with age. From 1990 to 2021, the global age-standardized prevalence rate increased by 0.9% (-0.6 to 2.7). In contrast, the age-standardized DALY rate decreased by 33.0% (29.4 to 36.5), and the age-standardized mortality rate dropped by 34.3% (30.7 to 37.8) for cardiovascular disease. Further studies indicate that the burden of DALYs and mortality is concentrated in countries with higher levels of sociodemographic development. The slope index of inequality revealed a significant reduction in inequalities related to sociodemographic index (SDI), with the gap in DALYs between the highest and lowest SDI countries decreasing from 3,078.1 per 100,000 in 1990 to 1,952.1 per 100,000 in 2021. Meanwhile, the concentration index also showed a decline from 1990 to 2021. **Conclusions** As a major health problem, the global burden of CVD showed an overall decreasing trend from 1990 to 2021. Countries with a high SDI bear a disproportionately large share of the CVD burden. However, over time, the inequalities related to SDI among countries have diminished. This

study emphasizes the considerable challenges in controlling and managing CVD, including the rising number of cases and ongoing disparities around the world. These findings can provide valuable insights for improving public health policies and effectively allocating medical resources.

Ind-1471 Unravelling Public Preferences for Use of Artificial Intelligence Mobile Health Applications: Discrete Choice Experiments from Australia

PRESENTER: **Vinh Vo**
AUTHORS: Maame Esi Woode, Stacy Carter, Chris Degeling, Gang Chen

Objectives To explore public opinion on the factors that drive the use of Artificial Intelligence (AI) mobile health (m-health) applications for heart disease and mental health, with a particular emphasis on diagnostics and virtual health assistance. **Methods** This study adopted a discrete choice experiment (DCE) to investigate the preferences of the Australian public across four distinct settings, encompassing heart disease and depression, in combination with AI Diagnostics and Virtual health assistant applications. Five attributes were considered, including anonymised data sharing, AI application interaction, the accuracy of AI results, the explanation of results provided by AI, and the funding source. Mixed logit and latent class conditional logit models were used to incorporate potential preference heterogeneity among respondents. **Results** Respondents (n=1,176) showed that AI result accuracy is the most crucial factor in AI m-health applications. Interaction between AI and humans is the second most important, highlighting the value of combining AI with human oversight. There is a preference for anonymised data to be shared, especially in Virtual Health Assistant applications. On the other hand, results explanation and funding source are generally less important. Preference heterogeneity existed that those who expressed fear of AI were less likely to opt for AI-powered solutions for heart disease diagnosis and virtual health assistance. Older adults (aged 60 and above) were less inclined to use AI for diagnostic purposes. Young adults (particularly those aged 18-29) were more likely to adopt AI-powered virtual health assistants for heart disease. Respondents with poorer health-related quality of life (HRQoL) were more likely to utilise AI-powered virtual health assistants. **Conclusions** It is evident that beyond the technical feasibility of AI applications, there are nuanced differences in public preferences for AI m-health AI applications. Understanding factors leading to these discrepancies would be valuable to ensuring safe and equitable acceptance and harnessing the full potential of AI technologies to enhance healthcare delivery and outcomes.

Ind-2346 An Exploration of Attribute Non-Attendance in Valuing SF-6Dv2 Health States Using a Discrete Choice Experiment

PRESENTER: **Jooho Moon**, Seoul National University
AUTHOR: Eun-Young Bae

Background In discrete choice experiments (DCE), respondents often overlook certain attributes when making decisions due to heuristic reasons, leading to potential biases in utility estimations derived from choice models. The use of DCEs to evaluate health state preferences is growing, having been applied in EQ-5D valuation studies and, more recently, in SF-6Dv2 valuation research. Given that the complexity of DCE designs or tasks increases the likelihood of Attribute Non-Attendance (ANA), it is notable that substantial ANA has already been observed in EQ-5D DCE studies. With six dimensions plus duration, the SF-6Dv2 design is even more complex than EQ-5D, making ANA a potentially critical issue in its valuation. **Objectives** This study aimed to assess the influence of ANA on the estimated value sets for SF-6Dv2 health states. **Methods** A web-based DCE incorporating duration was conducted following international protocols. The survey included 304 choice sets across four duration levels, divided into 38 blocks. A total of 3,800 respondents aged 18 or older were recruited using quota sampling based on gender, age, and region. To address the ANA issue, an endogenous attribute attendance (EAA) model was used to examine ANA across SF-6Dv2 dimensions. This model integrates two sets of probabilities into the unconditional choice probability: the first represents the likelihood of attending to specific attributes, and the second reflects the probability of choosing one alternative over another based on the subset of attended attributes. **Results** The results indicated a high proportion of respondents attended to Physical Function (PF) and Pain (PA), with attendance rates of 75% and 79%, respectively. In contrast, lower attendance rates were observed for Role Limitation (RL), Social Function (SF), and Mental Health (MH) at 28%, 54%, and 60%, respectively. Given these ANA probabilities, the estimated coefficients for PF and PA using the EAA logit model were -0.374 and -0.355, respectively, differing from the values obtained with the conditional logit model (-0.204 and -0.214). Likewise, the estimated coefficients for RL, SF, and MH also differed between the EAA logit model and the conditional logit model. **Conclusion** The findings indicate a tendency for respondents not to attend selectively to certain dimensions of the SF-6Dv2 in their decision-making processes. While this may influence the parameter estimates, further research is necessary to discern whether this behavior reflects heuristic strategies employed to simplify choices or genuine preferences for particular dimensions.

Ind-2648 The Impact of Hepatitis C and Socio-Demographic Variables on Health-Related Quality of Life Among Patients in Pakistan

PRESENTER: **Siwaporn Niyomsri**
AUTHORS: Peter Vickerman, Saeed Sadiq Hamid, Aaron G. Lim, Naheed Choudhry, Graham Foster, Huma Qureshi, Josephine Walker, Saad Niaz, Asad Chaudhry

Background and Aims: Pakistan has the highest global burden of hepatitis C virus (HCV) and can result in significant morbidity. We examined health-related quality of life (HRQoL) among the general population screened for hepatitis C virus infections in Pakistan, and identified key socio-demographic factors associated with HRQoL.

Methods: As part of the HepFREEPak study, a prospective multi-centre cross-sectional screening and treatment study was conducted in community and clinic-based settings in Karachi and Gujranwala, Pakistan. Participants aged 18 and over were recruited with a 1:5 ratio of HCV-infected to uninfected participants. HCV infection was confirmed through anti-HCV antibody and HCV RNA positivity (denoted HCV-

positive). Exclusions included prior chronic HCV and significant comorbidities. Cirrhosis diagnosis relied on clinical evidence and APRI/Fib-4 scores. Treatment comprised direct-acting antiviral (DAA)-based medications. HRQoL was assessed prior to diagnosis by the EuroQol-EQ-5D-3L survey tool and Visual Analogue Scale (VAS). Propensity score matching (PSM) was used to address participant imbalance between HCV-positive and negative groups. To determine factors associated with HRQoL, Tobit regressions analysed censored EQ5D scores, while logistic regression was performed to evaluate each EQ-5D domain.

Results: The study included 5,468 participants, median age 39 (IQR: 30, 50) years, 59.14% males. Of these, 1,263 were HCV-positive (23.10%). HCV-positive participants exhibited lower HRQoL (0.952; 95% CI: 0.947-0.956) compared to HCV-negative participants (0.979; 95% CI: 0.977-0.981, $p < 0.001$, unadjusted). After PSM, 778 individuals remained in each group. HCV-positive participants showed significant reductions in mobility, self-care, and pain/discomfort, but not usual activities difficulties and anxiety/depression. Logistic regression indicated that HCV-positive individuals aged 50 and over had higher odds of difficulties across all domains. Males had lower odds for mobility and self-care difficulties. Unemployment had higher odds almost all domains. Tobit regression confirmed lower EQ5D scores for HCV-positive individuals ($B = -0.054$, $SE = 0.009$, $p < 0.001$) than HCV-negative. Older age, unemployment, single status, and being divorced/widowed were linked to lower EQ5D scores, while being Urdu-speaking was associated with higher scores ($B = 0.080$, $SE = 0.034$, $p = 0.018$). Education level did not significantly affect EQ5D scores. Cirrhosis (24-week treatment duration) was not significantly associated with lower HRQoL ($B = -0.019$, $SE = 0.012$, $p = 0.104$).

Conclusions: HCV infection significantly impacts HRQoL in Pakistan, especially among those individuals with cirrhosis. Our findings emphasize the role of socio-demographic variables on HRQoL. Further research is needed to determine if HCV treatment can mitigate these effects.

3:30 PM –5:00 PM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Executive Room 2

Diabetes Care

MODERATOR: **Angela Chang**,

Ind-282 Cost-utility of IDegLira Versus Alternative Basal Insulin Intensification Therapies in Patients With Type 2 Diabetes Mellitus in a Chinese Setting

PRESENTER: **Junling Weng**
AUTHORS: Dunming Xiao, Yingyao Chen

Background: In 2021, IDegLira was introduced in China as a treatment option for patients with type 2 diabetes mellitus (T2DM). We aimed to evaluate the long-term cost-utility of IDegLira versus basal-bolus therapy and glucagon-like peptide-1 receptor agonist (GLP-1RA) added to basal insulin in T2DM patients who remain uncontrolled on basal insulin in China. **Methods:** The Swedish Institute for Health Economics (IHE) Cohort Model of T2DM was used to project health and cost outcomes over a 30-year time horizon. Baseline cohort characteristics were derived from the DUAL II China study. Treatment effects were derived from DUAL VII study and a pooled analysis. Costs were accounted from a health system perspective in China, expressed in 2023 Chinese yuan (CNY). Health outcomes were measured in quality-adjusted life years (QALYs). Health state utilities were derived from several publications. Future costs and clinical outcomes were discounted at 5% annually. The probability sensitivity analysis (PSA) was used to explore the robustness of the results. In scenario analysis, the impact of semaglutide was considered. **Results:** IDegLira was associated with an improvement of 0.011 QALYs and a reduction of CNY 23,815 versus GLP-1RA added to basal insulin. The PSA scatter plot showed that the vast majority of the scatter points fell in the fourth quadrant, with some falling in the third quadrant. Similarly, in comparison with basal-bolus therapy, IDegLira demonstrated a health gain of 0.810 QALYs and a cost reduction of CNY 91,217, making IDegLira the dominant option. The PSA indicated a 100% probability of IDegLira being cost-effective. The scenario analysis showed that compared to basal insulin combined with semaglutide, IDegLira reduced costs by CNY 36,972, but QALYs also reduced 0.044. **Conclusions:** For T2DM patients uncontrolled on basal insulin, IDegLira was projected to be dominant and worthy of clinical promotion both compared with basal-bolus therapy and GLP-1RA added to basal insulin in the Chinese setting. Semaglutide has certain advantages in clinical practice, but its price is relatively high.

Ind-565 Cost-Utility Analysis and Drug Pricing of Icodec Versus Degludec for Type 2 Diabetes Patients With Basal Insulin-Treated in China

PRESENTER: **SHANSHAN HU**
AUTHORS: CHENYANG SHI, GUORONG FAN

Objective Insulin icodec is a first once-weekly administration basal insulin analogue for type 2 diabetes. As so far, icodec is the first and only FDA-approved once-weekly version of basal insulin analogue. In China, insulin icodec was just approved for type 2 diabetes by center for drug evaluation. However, the price of icodec has yet to be established in Chinese market. Our study aimed to estimate the cost-effectiveness of once-weekly insulin icodec versus once-daily insulin degludec for type 2 diabetes patients with basal insulin-treated from the Chinese healthcare perspective and explore the most appropriate annual cost for icodec to provide promising suggestions for price and decision-makers. **Method** Long-term health outcomes and costs for icodec and degludec were simulated using the United Kingdom Prospective Diabetes Study Outcomes Model (version 2.1) over 40 years from the Chinese health care provider's perspective. The efficacy and safety data were obtained from the ONWARDS 2 trial. Cost-utility analysis and a binary search were used to investigate the price range of the icodec. Sensitivity analyses

were performed to verify the robustness of the base-case analysis results. **Results** After a 40-year simulation, the quality-adjusted life years (QALYs) of the icodec and degludec were 10.32 years and 10.28 years, respectively. At the initial assumption of the same annual costs of icodec and degludec of $455.40, icodec was the dominated therapy compared with degludec, with higher QALYs and lower total cost. After the binary search, we observed the annual cost range of icodec was $625.17 to $855.25. This cost range was finally adjusted to be $597.66 to $736.34 by one-way sensitivity analysis and verified by probabilistic sensitivity analysis and scenario analysis. The scenario analysis reveraled that the annual cost range of icodec could be $506.70 to $736.34 if the price of degludec decreased by 20% in the future. **Conclusion** From the Chinese healthcare providers' perspective, this study determined that icodec appears to be very cost-effective at an annual cost of $597.66, and cost-effective at $736.34, compared with degludec. The base-case analysis remained robust to 1-w SA and PSA. Consequently, using degludec as reference, the annual cost range of icodec appears to be $597.66 to $736.34. In the scenario analysis, if the price of degludec will decrease 20% in the future, the annual cost range of icodec is estimated to be $506.70 to $736.34. **Keywords** Cost-utility analysis, Insulin icodec, Insulin degludec, Type 2 diabetes, Drug pricing, China

Ind-1522 Cost-Effectiveness of Real-Time CGM vs Self-Monitoring of Blood Glucose in People with Type 2 Diabetes on Intensive Insulin Therapy in Australia

PRESENTER: **Moin Ahmed**
AUTHORS: Paul Sim, Hamza Alshannaq, David Simmons, Greg Norman

Introduction Evidence shows that real-time continuous glucose monitoring (RT-CGM) systems improve glycaemic control in people with type 2 diabetes (T2D) on intensive insulin therapy (IIT). Reimbursement for RT-CGM in Australia is currently limited to people with type 1 diabetes. Our analysis evaluates the cost-effectiveness of RT-CGM compared to self-monitoring blood glucose (SMBG) for people with T2D IIT in Australia. **Methods** We used the IQVIA Core Diabetes Model (CDM), comprising 17 Markov sub-models for diabetes complications over a lifetime horizon, to simulate clinical outcomes and direct medical costs from an Australian public healthcare system perspective. Effectiveness was measured in quality-adjusted life years (QALYs). A discount rate of 5% was applied in this analysis. Cohort characteristics included a mean age of 65 years, 51% male, and an average diabetes duration of 16 years. The adjusted HbA1c reduction for RT-CGM was -0.56%. Severe hypoglycemics and hyperglycaemia rates were 4% and 2.5% per patient-year (PPY) for SMBG and 0% PPY for RT-CGM, respectively. Utilities for avoiding fingerstick (0.03) and reducing fear of hypoglycaemia (0.025) were applied to RT-CGM users. Probabilistic and deterministic sensitivity analyses were conducted. **Results** RT-CGM users are projected to gain an additional 0.621 QALYs with $14,117 in incremental costs and an incremental cost-effectiveness ratio (ICER) of $23,426/QALY, below the $50,000/QALY willingness-to-pay threshold for Australia. Microvascular and macrovascular outcomes projections indicate that RT-CGM use results in a relative reduction in diabetes eye, renal, neuropathy, and cardiovascular complications of 17.7%, 21.1%, 8.7%, and 2.5%, respectively. Sensitivity analysis scenarios of RT-CGM cost reductions of 10%, 20%, and 30% resulted in ICERs of $18,666/QALY, $13,909/QALY, and $9,153/QALY, respectively. RT-CGM remained cost-effective even when costs were increased by 30%. Using Fremantle risk equations for 100% Southern European and 100% Indigenous Australian populations resulted in ICERs of $8,085/QALY and -$1,832/QALY (RT-CGM is dominant). **Conclusion** This study has demonstrated that using RT-CGM systems for diabetes management in people with T2D who are on intensive insulin is a cost-effective intervention. Findings support expanding reimbursement for RT-CGM in Australia.

Ind-1602 Economic Evaluation of the Joint Asia Diabetes Evaluation Public-Private Partnership Program in Hong Kong: A Patient-Level Simulation Analysis

PRESENTER: **Eric S.H. Lau**
AUTHORS: Elaine YK Chow, Juliana CN Chan, Minglu Zhang, Hong Jiang Wu, Juliana NM Lui, Andrea OY Luk

Background The public healthcare system in Hong Kong, which serves 90% of the population and supported by only 50% of healthcare workforce, is under significant strain, complicating effective diabetes care. Since 1995, the Chinese University of Hong Kong (CUHK) has implemented a series of quality improvement programs to add value to diabetes care. This included the establishment of the Hong Kong Diabetes Register (HKDR) to stratify risk, triage care, and empower patients. Since 2000, the protocol was adopted to become a territory-wide diabetes risk assessment program benefiting 0.5 million patients. In 2007, CUHK digitalized the HKDR into the web-based Joint Asia Diabetes Evaluation (JADE) Platform with protocols and risk engines to issue personalized report with decision support and provided the JADE-guided assessment through public-private partnerships (PPP). We evaluate the long-term cost-effectiveness of the JADE-PPP program compared to the risk assessment program implemented in the public sector with or without the JADE-assisted technology. **Methods** In the public setting, the non-JADE group (n=3,587) underwent structured assessment only, while the JADE group (n=9,601) received JADE personalized risk reports along with group nurse-led empowerment sessions. At a self-subsidized university-affiliated diabetes center, the JADE-PPP group (n=3,436), referred by their doctors or themselves, received personalized reports, individual nurse-led empowerment sessions, and annual follow-up reminders. We utilize the patient-level Chinese Diabetes Outcomes Model (CDOM) developed using the HKDR (n=21,543) and externally validated in Hong Kong public hospital territory-wide cohort (n=176,120) for individuals enrolled in 2002-2019. The CDOM encompasses ten endpoints, including cardiovascular and renal outcomes, cancer incidence, and all-cause mortality. It projected annual survival and events until age 110. Intervention included enrolment into 1) non-JADE program in public setting 2) JADE program in public setting, and 3) JADE-PPP program. Incremental healthcare costs and quality-of-life decrements associated with endpoints were estimated using data from the HKDR, along with treatment effects from our published studies. Quality-adjusted life-years (QALYs), years of life lost due to premature mortality and additional cost/QALY were estimated. Willingness-to-pay threshold of three-times Hong Kong GDP in 2023 (USD$50,696.6) was applied. Subgroup analysis were carried out by JADE risk levels, sex and age groups. **Results** The JADE-PPP and JADE groups experienced substantial increases in survival, with the JADE-PPP group achieving an additional 1.64 years (1.25 QALYs) compared to the non-JADE group with the JADE group having an increase of 0.44 years (0.37 QALYs). Both intervention groups demonstrated long-term cost-effectiveness, with ICERs (incremental cost-effectiveness ratio) of $10,317 for JADE-PPP and -$6,387 for JADE group. Across all JADE risk levels 1-4, enrolment in JADE was cost-saving (ICER range: -5,850 – -3,109) while JADE-PPP was cost-effective (ICER range: 12,831 – 14,155). Notably, JADE was most cost-saving for men with young-onset diabetes (age of diagnosis <40 years old) (ICER: -17,765) and JADE-PPP program was most cost-effective in men aged 60 and older (ICER: $9,580). **Conclusion** The JADE and JADE-PPP programs

substantially enhanced survival rates with long-term cost-effectiveness in diabetes management across all JADE risk categories, as well as diverse age and sex subgroups in Hong Kong.

Ind-2354 The Cost-Effectiveness of Continuous Glucose Monitoring (CGM) for Adults With Type 1 Diabetes in Ireland

PRESENTER: **Gintare Valentelyte**

AUTHORS: Edward W. Gregg, Jonathan Briody

Introduction Continuous Glucose Monitoring (CGM) improves glucose control in adults with type 1 diabetes. In 2024 CGM was nationally rolled out for all individuals living with type 1 diabetes in Ireland. We estimated the lifetime cost-effectiveness of CGM for adults with type 1 diabetes in Ireland, using a validated diabetes cost-effectiveness model. **Methods** We adapted the U.S. Centers for Disease Control and Prevention-RTI Diabetes Cost-Effectiveness Model to an Irish cohort living with type 1 diabetes. In this microsimulation model, we estimated the costs, quality-adjusted life-years (QALYs) and cost-effectiveness of CGM as an intervention relative to usual diabetes care i.e. self-monitoring of blood glucose (SMBG). In this microsimulation model, CGM may lead to reductions in other related complications, which we also modelled. Costs were considered from the Irish health care system's perspective. An annual discount rate of 4% was applied to future costs and outcomes. Uncertainty was evaluated using probabilistic sensitivity analysis. **Results** CGM was cost-effective relative to SMBG at the incremental cost-effectiveness ratio (ICER) of -€1,331 per QALY gained. Most simulations were below the commonly accepted willingness-to-pay threshold of €45,000 per QALY gained in Ireland. Additionally, CGM led to an average reduction in the share of patients with the associated complications and reduced incidence of many type 1 diabetes-related complications, compared to SMBG. Sensitivity analyses indicated that base-case results were robust. **Conclusion** This study provides evidence to support that nationally subsidised roll-out of CGM for the entire population living with type 1 diabetes in Ireland is cost-effective.

3:30 PM –5:00 PM MONDAY [Health Care Financing & Expenditures]

Bali International Convention Centre – Nusa Dua

Sub-National Health Financing for UHC

MODERATOR: **Laksono Trisnantoro**, "Health Policy and Management Department, Faculty of Medicine, Public Health and Nursing, University of Gadjah Mada"

abs-os352 Subnational Health Sector Financial Resource Prioritization and Management in Ghana

PRESENTER: **Mustapha Adams Hamidu**

AUTHORS: Ms. Zohra Balsara, Mark Akanko Achaw, Caesar Kogoziga, Afua N. Aggrey

Background

Ghana's fiscal decentralization in the late 1980s excluded the health sector to enable a more agile response to the rapidly changing needs of the healthcare system. However, this exception has continued to weaken the public financial management (PFM) system, exposing the health sector to fiscal and fiduciary risks. For example, the 2018 Ghana Public Expenditure and Financial Accountability (PEFA) Assessment identified several financial management challenges within the health sector, including a lack of mechanisms to ensure cost-effective resource use; unreported extra-budgetary operations; and insufficient controls in payroll, procurement, and asset management—resulting in mismanagement and waste.

To address these challenges, developing partners are strengthening the financial management capacities of Ghana Health Services (GHS), including expanding the use of the Ghana Integrated Financial Management Information System (GIFMIS) across all GHS budget management centers including health facilities, many of which operate at the subnational level.

Aim

This study aims to assess the effectiveness of the approaches implemented by USAID to enhance the financial management capacities of subnational GHS budget management centers. It also seeks to document lessons learned and best practices to inform the government's PFM strategy, which is focused on strengthening the planning process at all levels and ensuring better alignment of budgets with government strategies and priorities.

Methods

The study will analyse budget data from selected project districts to assess the accuracy and effectiveness of budget execution, as well as examine the alignment of spending with priority programs and the medium-term expenditure framework. Adapting the Organizational Capacity Assessment Suite of Tools and the PEFA methodology, the study evaluates the financial management capacities of GHS subnational departments and facilities.

Key Results

Budget execution rates in Ghana's health sector are generally low, particularly for donor-funded programs, with rates of 80% in 2022 and 87% in 2023. This has been largely associated to low budget releases and poor budget management, especially in allocations for capital investments. The study results will present a comparative analysis of expenditures by funding sources and economic classifications, along with capacity scores on key PFM service delivery objectives, including budgeting process quality and accountability, as well as key policy recommendations.

Conclusions

Investments in strengthening subnational PFM systems are often underprioritized, which systematically undermines the core objectives of PFM and service delivery goals. Well-functioning subnational PFM systems have the potential to better align health sector resources with community needs and ensure the efficient use of the limited resources. The USAID interventions offer an opportunity to mobilize increased investments to strengthen and reinforce PFM systems at all levels to ensure a transparent and efficient health system. 2 / 2

Ind-1765 Effect of Government-to-Government Financing Mechanisms on Subnational Public Financial Management and Service Delivery: Experience from Malawi

PRESENTER: **Mark Akanko Achaw**
AUTHORS: Dominic Albert Nkhoma, ATAMANDIKE CHINGWANDA, John Limited

Background

As in many low-income countries, Malawi's health system is characterized by fragmented and poorly coordinated donor funded vertical health programs. Much of this donor support is provided through off-budget projects, which can limit the effectiveness, transparency, and national ownership of priority health areas. In Malawi, a weak public financial management (PFM) system which often delays or restricts funds reaching last mile health facilities is often cited as the reason donors opt for off-budget financing support. However, this approach can be counterproductive, as off-budget funding may further weaken the PFM system. In 2022, the United States Agency for International Development (USAID) initiated a government-to-government (G2G) financing mechanism in the Mangochi and Zomba districts of Malawi. The mechanism, which provides direct funding to district councils aims to improve service delivery outcomes including maternal and child health. The support is accompanied by technical assistance to strengthen the districts' PFM systems.

Aim

As part of a broader public expenditure review, this study aimed to assess how donor resources can be efficiently channelled to the subnational level on-budget rather than off-budget to achieve better health outcomes while preserving the principles and service delivery goals of the PFM system.

Methods

The study employed a mixed-methods approach, combining policy document reviews, budget data analysis, and key informant interviews with district officials and community representatives. The sample included 28 health facilities across the Mangochi and Zomba districts. PFM service delivery goals and budget credibility were assessed using the Public Expenditure and Financial Accountability methodology and indicators. The study also analyzed health sector budget trends from 2016/17 to 2020/21 and evaluated the effectiveness of PFM in the health sector at G2G district councils and facility levels, comparing these findings with national-level data.

Key Results

The study found that the G2G financing mechanism strengthened the PFM system by improving the availability, timeliness, and predictability of on-budget funding at the district level. However, it has not impacted sub-district facility funding, highlighting the need for more direct funding to those facilities. The implementation of the G2G mechanism has also been associated with improvements in equitable access to essential primary healthcare services (including family planning, maternal and child health, HIV, and tuberculosis services), increased accountability in health services, performance-based resource financing, and evidence-based programming.

For example, during the implementation period, Mangochi saw a 59% increase in the uptake of tubal ligations from 2022 to 2023, along with a 15.6% increase in general family planning services. Accountability in service delivery was also enhanced through the introduction of community oversight in service provision. Additionally, the institutional maternal mortality ratio decreased in both districts, from 460 to 62 deaths per 1,000 live births between 2021 and 2023 in Zomba and from 200 to 147 deaths per 1,000 live births in Mangochi.

Conclusion

The G2G mechanism demonstrated that when donor funds are well-coordinated and aligned with government priorities, they can be effectively channelled through on-budget government support to achieve impactful health outcomes at the subnational level. 2 / 2

Ind-1238 Strengthening Budget Credibility at Subnational Levels: Lessons from Nepal's Health Sector

PRESENTER: **Hema Bhatt**

Background: Public Financial Management (PFM) in Nepal faces significant challenges, particularly in the health sector, where budget credibility remains low. This is evidenced by persistent underspending, frequent downward revisions, and discrepancies between allocated budgets and actual funds received by subnational governments (SNGs). Between 2018 and 2020, the health sector experienced substantial deviations in budget execution, with conditional grants comprising a large portion of expenditures. Existing financial management information systems (FMIS) at local levels are limited to economic-level data, making it difficult to track specific programs like health, education, and agriculture. These challenges hinder the tracking of progress against national and international indicators, including SDGs. This study examines budget credibility in Nepal's health sector in the context of federalism and explores solutions to improve service delivery.

Methods: A mixed-methods approach was used to assess budget credibility in Nepal's health sector post-federalism. Quantitative data were gathered by analyzing health expenditure deviations at the federal, provincial, and local levels using a health sector budget analysis dataset detailing fiscal transfers and local revenue contributions. Qualitative data were collected through interviews with health managers, account officers, and other stakeholders from three provinces and 38 municipalities. The study also explored the institutionalization of a budget credibility framework and associated training programs aimed at improving local-level financial management.

Findings: Budget credibility issues in Nepal's health sector were primarily driven by discrepancies between allocated budgets and actual expenditures at the local level. Conditional grants, which account for 77% of health expenditure at the local level, showed the largest deviation. Federal government contributions made up 58% of the total health budget, while subnational levels contributed 28% from internal revenues. Health expenditures funded by internal revenue had a higher deviation (35%) compared to those funded by fiscal transfers (15%). Key contributing factors to these deviations included the de-prioritization of health, inaccurate revenue forecasting, delayed fund releases, and procurement delays.

Training programs for local health managers and account officers improved understanding of the Public Financial Management (PFM) cycle and the importance of budget credibility. However, challenges persist in disaggregating budgets by sector and inconsistencies in financial reporting across government levels, which hinder effective budget utilization in health. While there have been positive impacts from training, the systems still lack the necessary granularity to track expenditure by program type, such as health, education, and agriculture, which further impedes progress on national and international goals.

Conclusion: Improving budget credibility in Nepal's health sector requires systemic changes at both the federal and subnational levels. The lack of accurate, disaggregated data and outdated, incompatible FMIS create significant challenges in tracking and reporting health expenditures, undermining efforts to meet national and international health targets. The institutionalization of a comprehensive budget credibility framework and local-level training programs have led to improvements in budget execution and monitoring. However, continued efforts are needed to standardize practices, improve data management systems, and integrate budgeting and financial reporting across all levels of government. Strengthening budget credibility is essential for better resource allocation, improved health outcomes, and achieving SDG targets.

Ind-1169 Assessing Optimal Principal-Agency Arrangements for Devolved Funds at Health Facility Level in Malawi

PRESENTER: **Dominic Albert Nkhoma**
AUTHORS: Joe Zonda, Gerald Manthalu, Moritz Piatti-Fuenfkirchen, Dayo Obure

1) Introduction

Achieving Universal Health Coverage (UHC) in environments with severe fiscal constraints requires effective provider management to improve efficiency in service delivery. In Malawi, the Direct Facility Financing (DFF) reform is being implemented and aims to transfer financial management responsibility from the central district administration to primary and secondary facilities in the public health sector. However, delegating autonomy of the budget process to providers without effective oversight can lead to serious misalignment of incentives. This paper examines the principle-agency arrangements that yield optimal oversight by the principle (community) and increase the likelihood of agent (provider) delivering optimal PFM outcomes.

2) Methods and Data

We examine variations in the setup and functioning of facility boards in Christian Health Association of Malawi (CHAM) owned facilities, comparing them with the common use of health facility management committes (HFMCs) in both Government and CHAM facilities. Additionally, we compare PFM outcomes across CHAM and government facilities, differentiating between health centres and hospitals. The Public Expenditure and Financial Accountability (PEFA) framework was used to assess and score (from lowest (1 or D) to highest (4 or A)) PFM stages of budget planning, execution and monitoring as well as facility performance with respect to efficiency, quality, equity and accountability. To gain deeper insights into differences in oversight between government and CHAM facilities, as well as across different levels of care, we conduct key informant interviews and focus group discussions with relevant stakeholders.

3) Findings

The analysis of PFM performance using the PEFA methodology reveals stronger alignment and better PFM outcomes among providers with active facility board governance structure. Specifically, CHAM hospitals achieved high PEFA scores, averaging an "A," compared to government hospitals, which scored "D." At the primary facility level, both CHAM and government-owned health centers performed poorly, with average score of "D," though government facilities slightly outperforming their CHAM counterparts. Despite similar ownership, CHAM health centres underperformed relative to CHAM hospitals, suggesting that ownership alone does explain the observed performance variations. Qualitative findings indicate that while HFMCs are common across both CHAM and government facilities, a key distinction lies in the presence of facility boards. CHAM hospitals benefit from facility boards overseeing budget planning, execution, and monitoring — governance structure absent in government facilities, and CHAM health centres. This distinction underscores the limitations of HFMCs, which primarily function in an advisory capacity. The findings suggest that enhancing community governance structures from mere advisory roles to exercising greater control over the PFM cycle could significantly improve provider management and, ultimately, service delivery outcomes.

4) Conclusions

These findings highlight the critical role of structured board oversight in enhancing PFM at provider level, emphasizing the importance of

board-level governance in aligning facility operations with UHC objectives. As Malawi scales up DFF, establishing robust board governance structures across both government and CHAM health facilities will be critical to improving performance. Ongoing research is further exploring variations in oversight arrangements across different CHAM proprietors to evaluate how these governance differences impact service delivery outcomes, including access, quality, and efficiency.

3:30 PM –5:00 PM MONDAY [Health Beyond The Health System]

Bali International Convention Centre – Jasmine

Inequalities in Health Outcomes

MODERATOR: **Jing-Jing Li**,

Ind-449 The Vicious Cycle of Bullying: Evidence from South Korean Children

PRESENTER: **Elcin Tuzel**

AUTHOR: Kam Ki Tang

Abstract Research has shown that victims of bullying can also become bullies (known as bully-victims). A substantial body of literature examines the similarities and differences between bullies, victims, and bully-victims in terms of contributing factors and their mental health outcomes. However, these studies overlook the quantitative and causal relationship between victimisation and the likelihood of later becoming a bully. This study addresses this gap by quantifying the impact of victimisation on a child's likelihood of engaging in bullying behaviour using longitudinal data from the Korean Youth Panel Survey, which follows students over five years. Our dataset of 26259 observations shows that about 9% of students report experiencing bullying. We follow the staggered difference and differences design which accounts for lagged treatment effects, potential treatment attrition, and varying treatment intensities over time. Our results show that peer maltreatment, most likely by schoolmates, increases the likelihood of a victim becoming a bully in the following year by 19 percentage points. In mathematical terms, the 19 percentage point increase in the probability of a child becoming a bully in the year after bullying alone implies a social multiplier of 1.21 (=1/(1-0.19)). This finding, that the social multiplier is noticeably greater than one, suggests an alarming possibility: bullying is a self-perpetuating phenomenon, at least within the related population subgroup. Our results also suggest that any policy intervention aimed at breaking the bully-victim cycle and reducing the negative impact of bullying on children should focus primarily on changing the toxic environment in schools.

Ind-338 COVID-19 Socioeconomic Inequalities in Individual Well-Being in Switzerland

PRESENTER: **Jeanne Berche**

AUTHORS: Mauricio Avendano, Joachim Marti

Background: Despite Switzerland's high standard of living and healthcare capacity, the COVID-19 pandemic exposed and deepened social and economic disparities within its population. Existing research has largely overlooked the interplay of individual and environmental factors in shaping well-being outcomes. This study addresses this gap by assessing the impact of the pandemic on socio-economic inequalities in well-being, incorporating not only individual sociodemographic factors but also environmental variables, such as green space density and neighborhood characteristics. **Aim:** We investigate the impact of COVID-19 on socioeconomic disparities in well-being in Switzerland. **Methods:** Using the equality of opportunity framework (Roemer, 1998), we classify determinants of well-being into "circumstances" (beyond individual control) and "efforts" (reflecting personal actions). We analyze inequalities by applying a counterfactual approach to isolate inequality rooted in circumstances, measured through transformed well-being distributions. Data from the Swiss Household Panel (SHP), covering 2018 to 2022, and a dedicated COVID-19 survey conducted in 2020, allow for an analysis of changes in life satisfaction, social relationships, and financial status before, during, and after the pandemic. The Shapley-Shorrocks decomposition technique, based on cooperative game theory, quantifies the contribution of each factor to inequality dynamics over time. **Data:** The SHP provides comprehensive longitudinal data across domains such as employment, education, and social relationships. Our sample includes 4,197 individuals who responded consistently across all waves. Additionally, environmental data from geographical databases complement the analysis by capturing neighborhood characteristics relevant to well-being disparities. **Key Results:** Well-being declined significantly during the pandemic, with increased socioeconomic inequality in life and relationship satisfaction, while financial inequalities temporarily narrowed. Although life satisfaction disparities returned to baseline, inequalities in personal relationships persisted, indicating lingering impacts of the crisis. Shapley decomposition results show that individual factors became more significant drivers of inequality during COVID-19, while environmental variables, such as neighborhood density and green space access, regained importance post-pandemic. **Conclusions and Implications:** These findings underscore the uneven impact of the pandemic on well-being and the necessity for policies that address both socioeconomic and environmental inequalities to build resilience for future crises. Supporting equitable access to quality housing and community resources may mitigate adverse effects on well-being during restrictive periods, while robust financial support mechanisms can help alleviate temporary financial inequalities and support recovery in overall well-being.

Ind-2774 Socioeconomic Inequality in Hypertension Care Continuum in Southern States of India: Analysis of Nationally Representative Data

PRESENTER: **Susmita Dutta**

AUTHORS: Pijush Kanti Khan, Atanu Ghosh, Suraj Maiti

Background

Hypertension is a major contributor to non-communicable disease burden and poses a significant public health challenge in the southern states

of India. Understanding the prevalence, awareness, treatment, and control (ATC) rates of hypertension, as well as associated socioeconomic inequalities, is crucial for developing effective interventions and policies. This study aimed to analyze hypertension prevalence and ATC among individuals aged 15 years and above in South India.

Methods

Utilizing the data from the recent National Family Health Survey (NFHS) (2019-21), we analyzed hypertension prevalence and awareness, treatment, and control (ATC) rates among 285,728 individuals aged 15 years and above in the southern states of India. Hypertension was defined as systolic BP ≥140 mm Hg, diastolic BP ≥90 mm Hg, or self-reported use of antihypertensive medication. Awareness, treatment, and control were assessed among those with hypertension. Multivariable logistic regression and concentration indices and curves were employed to assess socioeconomic inequalities in hypertension management.

Findings

Hypertension prevalence was estimated at 29.8% (29.4, 30.1%). While awareness was relatively high (44.3% (43.5, 45.2%)), treatment-seeking (35.5% (34.8, 36.1%)) and control rates (26.0% (25.5, 26.6%)) were suboptimal. Pro-rich socioeconomic inequalities were evident across the hypertension care continuum, with wealthier individuals exhibiting better ATC outcomes. The difference in awareness between the lowest and highest wealth quintiles was 22 percentage points (pp), while treatment and control rates differed by 21 and 18 pp, respectively. Urban residence and higher education levels were associated with improved hypertension care. Females were more likely than males to be aware of having hypertension, receiving treatment, and maintaining control. Among the southern states, Telangana had the highest prevalence of hypertension (31.7%), while Kerala showed the highest rates of awareness, treatment, and control (54.9%).

Conclusion and Recommendations

There is a significantly high burden of hypertension in southern India, with nearly one in three adults affected. While awareness rates are relatively high, treatment and control rates remain suboptimal. Substantial socioeconomic inequalities exist across the hypertension care continuum, with disadvantaged groups experiencing poorer outcomes. Strategies such as expanding access to primary healthcare, enhancing health literacy, and strengthening community-based interventions could help mitigate disparities and reduce the burden of hypertension in the region. Future research should focus on longitudinal studies to capture changing trends in hypertension care and evaluate the effectiveness of interventions aimed at reducing socioeconomic inequalities.

Keywords: Hypertension, Care cascade, inequality, pro rich, India

Ind-2813 The Impact of Uber on Traffic Fatalities in Mexico: Evidence from Three Quasi-natural Experiments

PRESENTER: **Jorge Morales Alfaro**

Background: The introduction of ridesharing services, such as Uber, has been linked to reductions in traffic fatalities in high-income countries like the U.S., but their impact in middle-income contexts remains understudied. In countries with lower car ownership rates and less reliable public transit or taxicab options, the dynamics of ridesharing adoption and mortality effects may differ substantially. My study extends the analysis to Mexico, examining the impact of Uber on traffic fatalities, particularly those related to alcohol consumption, through three quasi-natural experiments exploiting the introduction and political regulation of cash payments. In 2016, Uber began accepting cash payments in 13 Mexican cities, sharply increasing utilization, particularly in low-income areas. In three cities, cash acceptance was politically restricted, creating natural experiments. In Mexico City and Querétaro, cash was banned from 2016 until a Supreme Court ruling in 2018; in Puebla, cash payments were accepted in 2016 but banned in 2017 after media concerns about safety. These events generate exogenous variation in Uber ridership, enabling robust causal inference. **Methods:** Three identification strategies are employed. First, an event study evaluates traffic fatalities across 15 cities with staggered cash acceptance dates, using Mexico City and Querétaro as controls. Second, a regression discontinuity design (RDD) analyzes ridership effects near the State of Mexico-Mexico City border, leveraging the discrepancy in cash payment policies between 2016 and 2018. Third, a synthetic control approach estimates the effects of Uber's adoption and subsequent ban in Puebla. Further specifications include restricting the analysis to nighttime fatalities as a proxy for drunk driving. **Preliminary Results:** My event study results show no statistical effect on the reduction of overall traffic fatalities. Further robustness and sensitivity analysis are needed to be sure that this result holds, as the trends in raw data in some cities show clear decreases in the trends after the ban. Analysis using nighttime data is pending to infer avoidance of alcohol related deaths. Analysis of Puebla's adoption-ban experiment and the RDD framework remains ongoing, the latter contingent upon the acquisition of granular georeferenced data from the statistical bureau of Mexico or local governments. **Discussion:** This research will offer evidence on the health effects of ridesharing in middle-income countries. By leveraging natural experiments, it contributes to understanding ridesharing's public health outcomes and allows to better estimate the potential benefits of expanding public transportation and the value of alternative solutions that face regulations challenges. Avoiding drunk driving is usually signaled as one of the most important effects of ridesharing, this research will provide evidence to support this claim.

abs-os624 Income Inequality and Crime Rates: Their Role in Police Fatal Shootings Across U.S. Counties (2015-2022)

PRESENTER: **Hossein Zare**, JHU

AUTHORS: Khushbu Balsara, Mojgan Azadi, Danielle Gilmore, Darrell Gaskin, Shervin Assari

IMPORTANCE: Income inequality, crime rates, and racial composition are critical factors influencing fatal police encounters, with significant racial disparities observed. Addressing these disparities is vital for promoting equality and justice within law enforcement practices.

OBJECTIVE: To examine the impact of income inequality (Gini Coefficient), crime rates, and racial composition on fatal police shootings across U.S. counties from 2015 to 2022.

DATA & METHODS: We analyzed data from Mapping Police Violence and the Washington Post, which documented 7,082 fatal police shootings across 3,144 counties. This data was integrated with demographic and socioeconomic variables from the American Community Survey. Negative binomial regression models were used to assess the association between income inequality and fatal shootings by race/ethnicity, accounting for population density, age distribution, racial composition, and crime rates. Interaction terms were incorporated to explore how high-crime areas and population factors modified these relationships. State and year fixed effects were included to control local and regional variation.
RESULTS: Higher income inequality (Gini Coefficient) was significantly associated with increased fatal police shootings. The greatest disparities were observed among Black individuals (incident rate ratio [IRR]: 7.058, 95% CI: 4.389–9.726), compared to White (IRR: 3.170, 95% CI: 1.536–4.804) and Hispanic populations (IRR: 3.057, 95% CI: -0.206–6.320). Interaction analyses showed that high-crime areas amplified these effects, with Black populations experiencing the most significant disparities (IRR: 1.291, 95% CI: 1.095–1.486). Additionally, population density and age distribution played modifying roles, further illustrating the intersectionality of geographic and social factors.
CONCLUSIONS: The study highlights the profound impact of income inequality, racial demographics, and geographic disparities on fatal police shootings. While legislative and community efforts have sought to address policing disparities, significant gaps persist. Policymakers must prioritize structural reforms, including equitable resource allocation, institutional transparency, and community-police relationship building, to combat systemic racism and reduce fatal encounters.

3:30 PM –5:00 PM MONDAY [Health Care Financing & Expenditures]

Bali International Convention Centre – Magnolia

OOP and Catastrophic Health Spending

MODERATOR: **Mohit Pandey**,

Ind-946 Drivers of Unexpected Health Expenses and Their Association with Healthcare Access: Evidence from 19 European Countries

PRESENTER: **Jean Pierre Uwitonze**
AUTHORS: Clément Meier, Irene Papanicolas

With growing global concern about out-of-pocket (OOP) health expenses, research has highlighted their disproportionate burden on certain populations. However, most studies treat OOPs as a uniform phenomenon, overlooking key dimensions such as their unpredictability and differing perceptions of what constitutes a “large” expense across health systems. Using data from Waves 6 and 8 of the Survey on Health, Ageing, and Retirement in Europe (SHARE), we introduce the notion of predictability into OOP cross country comparative research and provide novel evidence on unexpected health expenses across European countries. We examined how perceptions of “large” OOPs vary across European countries and examine individual/household, and system-level factors associations with large, unexpected health expenses (UHEs). Switzerland and Luxembourg reported the highest average OOP payments, while Slovenia and Croatia had the lowest, revealing diverse national thresholds for "large" expenses. Households with prior UHEs consistently reported higher OOP amounts and OOP-to-income ratios. Individual/household level factors such as gender, financial hardship, and poor health were significantly associated with UHE encounters. At system level, households in social health insurance and specialist-oriented health systems were more likely to have ever encountered large UHEs. Household level factors explained more variation in households’ UHE encounters compared to system level factors. Our findings imply that it is important to consider the predictability of OOPs, to contextualize what constitutes a “large” OOP health expense within local norms and to target household-level interventions in health financing policy.

Ind-2694 A Threshold-Agnostic Measure of Catastrophic Health Expenditure and Catastrophic Health Expenditure Sensitivity Curves across 131 Countries, 1995-2018

PRESENTER: **Jacopo Gabani**, University of York
AUTHOR: Marc Suhrcke

BACKGROUND: Universal health coverage (UHC) is a priority for many governments around the world. Governments use catastrophic health expenditure (CHE) incidence to monitor progress toward UHC, which is also part of the Sustainable Development Goals framework (SDG 3.8.2). However, the debate on how to measure financial risk protection across countries is ongoing. One critical point in estimating CHE incidence is that a threshold must be chosen to derive it. For example, SDG 3.8.2 uses 10% and 25% as thresholds. This raises two issues. First, country rankings and trends based on CHE are sensitive to threshold changes, which may hinder deriving consistent conclusions about UHC progress when CHE trends vary by threshold. Second, any threshold chosen reflects an arbitrary choice. Therefore, developing a threshold-agnostic CHE measure would be a desirable aspiration. **METHODS and RESULTS**: In this theoretical and methodological paper, we first define threshold-agnostic CHE as the area under the CHE incidence sensitivity curve, which has been widely used to analyse CHE across different thresholds. Then, we prove mathematically a perhaps unappreciated property of the widely used out-of-pocket (OOP) health expenditure budget share (i.e., OOP health expenditures as a percentage of total household expenditures): the OOP health expenditure budget share is equivalent to the area under the CHE incidence sensitivity curve, and therefore it is a threshold-agnostic measure of CHE. To address potential concerns with the OOP budget share not being representative in case where the distribution of OOP health expenditure is highly concentrated in very few households, we provide CHE sensitivity curves derived from 504 household surveys, across 131 countries (period: 1995-2018). **DISCUSSION**: This paper underscores the value of the OOP health expenditure budget share as a threshold-agnostic measure of catastrophic health expenditure. While it does not replace threshold-based measures like CHE-10% or CHE-25%, its simplicity, accessibility, and robustness make it a valuable complementary tool for monitoring financial risk protection. By avoiding the arbitrariness of threshold selection, the OOP budget share offers consistent cross-country comparisons and highlights financial burdens even when they fall below commonly used thresholds. However, it is not without limitations – such as its inability to capture extreme variations in expenditure concentration – reinforcing the need to use it alongside other tools like CHE sensitivity curves and traditional incidence measures. Together,

these measures provide a more comprehensive understanding of financial risk protection, equipping policymakers and analysts with the insights needed to design effective interventions and track progress toward universal health coverage.

Ind-1506 Financial Protection Against Catastrophic Health Expenditure in Burkina Faso: Evidence From National Surveys Conducted in 2014 and 2018

PRESENTER: **Offosse Marie-Jeanne Ngbesso**
AUTHORS: Jean Edouard Doamba, Aduragbemi Banke-Thomas, Nirmala Ravishankar, Pierre S. Yaméogo

Background Several African countries, including Burkina Faso, have introduced various health financing mechanisms ranging from user fee removal, social health insurance, and performance-based financing to protect households from financial hardships while seeking health services. However, evidence of the effectiveness of such interventions in minimising financial hardship remains limited. In this study, we investigate the degree and patterns of financial protection achieved in Burkina Faso amid the series of health financing mechanisms implemented in the country since 2010. **Method** Our analysis draws on two national surveys in Burkina Faso which collected data on the living conditions of households in 2014 and 2018 - the 2014 Continuous Multi-sector Survey on the Living Conditions of Households (EMC) and the 2018 Harmonized Survey on Household Living Conditions (EHCVM). We set a threshold of 40% of household expenditure after subsistence needs have been met as the cut-off for catastrophic health expenditure and below the World Bank's extreme poverty line of US$1.9 per day in non-poor households as impoverishment due to health. We calculated and compared the incidence and intensity of catastrophic health expenditure based on household expenditure and poverty-level data. We employed the z test to compare the proportions of catastrophic health expenditure and impoverishment observed in the EMC 2014 with the EHCVM 2018 surveys. We also analysed the frequency of occurrence based on the location of residence (rural versus urban) and the income distribution between the two time periods. The Chi-square test for independence was used to ascertain any statistically significant association between groups and periods, with a significance level of 0.05. **Results** The proportion of households facing catastrophic health expenditure fell from 3.5% to 1.0%, and impoverishment due to health decreased from 4.7% to 2.5%. However, data shows significant inequalities between socio-economic groups persist. First, the decline in the incidence of catastrophic health expenditures from 2014 to 2018 is more noticeable within the richer quintiles, 3.5% for the fourth quintile and 3.0% for the fifth quintile, while the other quintiles recorded a drop between 1.5% and 2.5% ($p<0.05$). Impoverishment is more pronounced for the poor (8.9% for quintile 2) and decreased by 0.2% and 0.1%, respectively, for rich quintiles 4 and 5 ($p<0.05$). Considering the place of residence, although catastrophic health expenditure was less pronounced in rural areas in 2018, impoverishment due to health expenditure was more prevalent in rural areas (61.5%) as compared to urban settings (15.1%) ($p<0.05$). **Conclusion** In the context of pluralistic health financing reforms being implemented in the country, catastrophic health expenditure and impoverishment due to healthcare expenses have decreased in Burkina Faso. However, not all socio-economic groups are equally impacted, especially the poorest and most rural families. Policymakers can further mitigate the financial burden of healthcare costs for vulnerable populations by specifically targeting them with bespoke policies that ensure that no one is left behind.

Ind-65 Out-of-Pocket Expenditure on Maternal Health Service Utilization in India: An Analysis of National Family Health Survey (NFHS-5) Data

PRESENTER: **Ajay Kumar Singh**, The Asia Foundation
AUTHORS: Ruchi Jain, Tamal Reja

Background: In India, maternal health services have received increasing attention in policy circles, especially with programs like Janani Suraksha Yojana (JSY) and Pradhan Mantri Jan Arogya Yojana (PMJAY) aiming to reduce maternal mortality and improve access to healthcare. However, despite these efforts, significant out-of-pocket expenditure (OOPE) continues to pose a financial burden for households. This study utilizes data from the National Family Health Survey (NFHS-5, 2019-21) to assess the OOPE associated with maternal health service utilization, with a focus on gender differences in expenditure patterns and state-wise variations and also to examine the state-wise variation in OOPE for maternal health, identifying both high and low-expenditure states. **Methods:** This study utilizes data from the NFHS-5,to analyze the out-of-pocket expenditure (OOPE) incurred for maternal health services in India. The NFHS-5 data includes responses from 636,699 households, which provides comprehensive information on healthcare utilization and expenditure across India. The focus is on OOPE related to key maternal health services, including antenatal care (ANC), delivery services, postnatal care (PNC), and institutional deliveries. The analysis separates expenditures for women and men, recognizing that men often bear indirect costs (e.g., transportation, informal fees) while women bear direct healthcare costs. Descriptive statistics were used to calculate the average OOPE, with the data segregated by gender, state, and type of healthcare facility (public or private). State-wise variations are presented, and special attention is given to aspirational districts, where access to healthcare services remains limited. **Results:** The analysis of NFHS-5 data reveals significant out-of-pocket expenditure (OOPE) on maternal health services, with women incurring an average of ₹6,800 ($82 USD), higher in private facilities (₹11,200 or $135 USD) than in public ones (₹3,500 or $42 USD). Men typically contribute ₹1,800 ($22 USD) in indirect costs like transportation. Urban areas exhibit higher OOPE, averaging ₹8,500 ($103 USD) for women due to greater reliance on private healthcare, whereas rural women average ₹4,500 ($54 USD), often utilizing public services. State-wise, Kerala and Tamil Nadu reported lower OOPE, while Uttar Pradesh and Bihar showed higher costs, exceeding ₹8,500 ($103 USD). In aspirational districts like Dantewada (Chhattisgarh) and Nuh (Haryana), OOPE surpassed ₹10,000 ($121 USD), highlighting limited healthcare access. Women bear most direct costs, while men cover logistics, underscoring the need for targeted policies to reduce financial burdens in high-cost regions. **Conclusion:** The NFHS-5 data highlights substantial OOPE on maternal health services in India, with significant variation across states and aspirational districts. Women, despite benefiting from government schemes, continue to bear considerable direct healthcare costs, while men often cover indirect costs. States like Kerala and Tamil Nadu perform better in reducing OOPE, while Uttar Pradesh, Bihar, and many aspirational districts experience disproportionately high expenditures. These findings underscore the need for targeted policy interventions, particularly in high-burden regions, to reduce OOPE and ensure equitable access to maternal health services.

Bali International Convention Centre – Bougainville

Economic Evaluations of Key Infectious Diseases

MODERATOR: **Lucy Cunnama**, Health Economics Unit and Division, University of Cape Town, South Africa

Ind-2459 Projecting Public Health Impact and Cost-effectiveness of Interventions Against Mosquito-borne Diseases Using Optimal Control

PRESENTER: **Alex Perkins**

Mosquito-borne diseases, such as malaria and dengue, impose a persistent burden on the health of billions of people throughout the Global South. Although vaccines were recently approved for use against these diseases, no currently available vaccine is alone sufficient to achieve public health goals for control of these diseases. This means that continued use of interventions that target mosquitoes is necessary. At the same time, interventions against mosquitoes have imperfect effectiveness, exert temporary effects, and are often labor-intensive to implement correctly. In addition, a variety of novel interventions against mosquitoes are under evaluation or in the early stages of adoption, which makes the evaluation of the public health impact and cost-effectiveness of mosquito interventions a timely topic. In this presentation, I will describe a new approach for projecting the public health impact and cost-effectiveness of mosquito interventions, which simultaneously identifies the optimal use of these vaccines. This latter feature solves the challenging problem of specifying coverage scenarios for these interventions, which necessitate careful and locally tailored targeting over time with respect to mosquito-borne disease transmission seasons. This feature also generates outputs that can be used to guide the use pattern of the intervention in a given context or to project potential future demand, assuming optimal use. In addition to the general capabilities of this approach, I will give a technical overview in two parts. First, I will describe the development and application of dynamic transmission models for malaria and dengue in any local context where globally available products on temperature, mosquito occurrence, and other inputs are available (generally at 5 km x 5 km spatial resolution). Second, I will describe the formulation of an optimal control problem, which uses Pontryagin's maximum principle together with published estimates of costs associated with the health burden of malaria and dengue and the costs of interventions. After describing the approach, I will present illustrative results of this approach for both malaria and dengue. For malaria, results indicate that the cost-effectiveness of novel interventions to reduce mosquito blood-feeding on humans depends on a combination of local epidemiology and use of long-lasting insecticide-treated nets. For dengue, results indicate that conventional mosquito interventions could lead to short-term reductions in disease burden but will be counteracted over time as short-term reductions in transmission allow for the buildup of population susceptibility. Overall, this approach to projecting the public health impact and cost-effectiveness of optimally deployed mosquito interventions provides needed information to abate the burden of mosquito-borne diseases while the world awaits the development of improved long-term approaches to control of these diseases.

Ind-130 Prioritising Resource Allocation Between and Within Heterogeneous Countries: A Tool to Support Decision-Making for Perennial Malaria Chemoprevention

PRESENTER: **Catherine Pitt**, London School of Hygeine and Tropical Medicine
AUTHOR: Plus Project

Introduction

Evidence on cost-effectiveness is increasingly used to inform prioritisation of health interventions within countries and within international donor institutions. In the World Health Organization (WHO) Africa Region, 233 million malaria cases and 580,000 deaths occurred in 2022, primarily in young children. International donors provided two-thirds of the region's $3.3 billion annual investment in malaria interventions, but funding remains far below need. Prioritisation of these scarce resources is particularly complex because of the growing number of available malaria interventions; heterogeneity in malaria transmission, deaths, drug and insecticide resistance, intervention coverage, and costs; and the multiplicity of stakeholders involved in international and sub-national malaria resource allocation processes. We developed a tool to support prioritisation of delivery models and geographies for perennial malaria chemoprevention (PMC), a WHO-recommended preventive intervention for young children.

Methods

In consultation with stakeholders, we modelled the potential impact and costs of PMC implementation across eligible countries, defined as those with moderate to high perennial transmission in sub-Saharan Africa. Estimates were modelled at the upper-administrative level within each country. We combined secondary analyses of empirical evidence from the Plus Project multidisciplinary evaluations with publicly available secondary data and estimates available across the continent. We modelled variation across geographies and other factors in the protective efficacy of sulphadoxine-pyrimethamine; malaria incidence in the absence of PMC; expected PMC coverage; and in unit costs per PMC dose and malaria case treated. Incidence and deaths were modelled using the individual-based malariasimulation model, adapted to generate age-based estimates. We identified expansion pathways based on the incremental economic cost to the public provider (domestic government and donor combined) per disability-adjusted life-year averted.

Results

We find that >27 million children under 2 years of age in 25 countries live in areas eligible for PMC. We present an interactive web-based PMC decision tool coded in R-shiny, with options for user data input. Users can choose to view country-specific or continent-wide rankings of PMC delivery models and geographies based on cost-effectiveness. Country-specific cost-effectiveness thresholds are presented along with thresholds

to reflect the opportunity costs of donor investments. Ranking tables include estimates of cumulative financial costs of programme implementation to allow comparison with programme budgets, as well as cumulative estimates of cases and deaths averted and economic costs. Maps illustrate main findings.

Conclusion

We offer new evidence to support prioritisation of alternative PMC delivery models within and between countries across the continent. PMC has the potential to reduce substantially the numbers of malaria cases and deaths in young children across Africa. The expected impact of PMC varies substantially with the expected variation in coverage, efficacy, and malaria incidence in the absence of PMC, as well as with the chosen delivery schedule, but PMC can still improve health in contexts where either expected coverage or efficacy are not high. Cost-effectiveness – and thus the specific geographies and delivery models to prioritise – varies both with impact and the projected heterogenous costs of PMC implementation and malaria treatment. Our approach may serve as a framework for wider malaria prioritisation processes.

Ind-1032 Cost-effectiveness of Iron Supplementation With Malaria Chemoprevention for Malawian Children (IRMA Trial): Evidence From a Randomised Control Trial

PRESENTER: **Patrick Abraham**, University of Melbourne
AUTHORS: Natalie Carvalho, Martin Mwangi, Mayamiko Kapulula, Glory Mzembe, Sabine Braat, Ricardo Ataide, Kamija Phiri, Maclean Vokhiwa, Chikondi Ngwira, Sant-Rayn Pasricha, Alistair Maclean, Ernest Moya

Background/Objectives

The World Health Organization recommends universal iron supplements (e.g. syrup) or iron-containing Multiple Micronutrient Powders (MNPs) to all infants living where anaemia is prevalent, to alleviate negative functional effects on child development and health, however, effectiveness and cost-effectiveness evidence are limited. Additionally, iron supplementation in malaria-endemic settings is thought to increase clinical malaria incidence, raising challenges in determining optimum health policies in these settings. We aimed to determine the cost-effectiveness of iron supplementation under malaria prophylaxis for infants in a malaria endemic setting.

Methods IRMA was a four-arm, double-blind, triple-dummy placebo-controlled randomised controlled trial set in southern Malawi. Children of 6 months of age were randomised to 6 months of a) placebo anti-malarials monthly + daily placebo syrup + daily placebo MNPs; b) Dihydroartemisinin-Piperaquine (active DP) monthly for 6 months + daily placebo syrup + daily placebo MNPs; c) active DP + daily iron syrup (10mg elemental iron) + daily placebo MNPs; or d) active DP + daily placebo syrup + daily MNPs (10mg elemental iron + 13 other micronutrients), and followed up 6 months post intervention. We conducted a within-trial cost-utility analysis using individual patient level data from a partial societal perspective, including direct medical costs to the health system and out-of-pocket costs. Disability-adjusted life-years (DALYs) due to anaemia and malaria were used as primary outcomes in the cost-effectiveness analysis, using disability weights from the Global Burden of Disease (2019) and duration of illness from trial data. Incremental Cost-Effectiveness Ratios (ICERs) were compared to 0.5 and 1x GDP based thresholds, with one-way and probabilistic sensitivity analysis using non-parametric bootstrapping performed to determine the likelihood of the iron interventions being cost-effective.

Results We recruited 2168 infants to the trial (71% anaemic; Hb <105 g/L) at baseline, with 90% of participants assessed at the primary outcome timepoint. Compared to children receiving DP alone, moderate and severe anaemia was reduced in children receiving iron syrup or MNPs. Malaria incidence wasn't significantly affected by iron and was mitigated by chemoprevention compared to placebo during the treatment period. There were no significant differences in cognition scores, motor development, length, or weight across the study arms during treatment. Despite the relatively small intervention cost per child (less than US$7.5), universal iron syrups and MNPs administered alongside malaria chemoprevention are unlikely to be cost-effective in this setting, as minor sustained-clinical benefit resulted in minimal DALYs averted. Results will be presented using probabilistic sensitivity analysis and cost-effectiveness acceptability curves.

Conclusion These findings do not support the use of universal iron supplementation with malaria chemoprevention as a cost-effective public health strategy for young children in Malawi. Global recommendations need to consider the cost-effectiveness of health policies, particularly for universally applied interventions with potentially limited clinical benefit. Results of this economic evaluation indicate the need for updates to global nutrition policy, particularly in highly resource constrained settings.

abs-os440 Extended Cost-Effectiveness Analysis of Decentralized TB testing Versus Hub-and-Spoke in Mozambique and Tanzania

PRESENTER: **Saima Arif**
AUTHORS: Lelisa Fekadu, Akash Malhotra, David Dowdy, Ms. Manuela De Allegri, Claudia Denkinger

Background: In low- and middle-income countries (LMICs), tuberculosis (TB) regained its status as a leading cause of death from a single infectious agent in 2023, surpassing COVID-19 Rapid diagnosis is key for effective TB management, requiring access to fast, accurate tests. Decentralized diagnostic algorithms for detection of TB and rifampicin-resistance offer new possibilities. As part of a multicentre real-world cluster-randomized controlled trial (cRCT) evaluating a novel decentralized diagnostic strategy, we analysed both implementation costs and participants' out-of-pocket (OOP) expenditures (including direct and indirect costs) across different socioeconomic groups (SES) from a societal perspective. **Methods:** This** cRCT compared decentralized point-of-care TB testing using the Molbio Truenat platform with MTB Plus and MTB-RIF Dx assays (intervention arm) versus hub-and-spoke Xpert MTB/RIF Ultra testing (control arm) in Tanzania and Mozambique. Economic data were collected as part of the trial along with asset ownership information using an equity tool. Multiple Correspondence Analysis (MCA) was employed to create an asset index for each country based on ownership data. We conducted an Extended cost-effectiveness analysis (ECEA) to estimate incremental participant costs for TB diagnosis and health outcomes, measured by number of TB

treatment initiated within seven and sixty days across SES groups. A Distributional Cost-Effectiveness Analysis (DCEA) assessed the incremental facility-based diagnostic cost per participant initiating TB treatment within seven and sixty days, from a societal perspective, across SES groups. Regression analyses further explored the intervention's impact on direct, indirect, and total costs for participants. **Results** In the intervention group, 82% of individuals with microbiologically confirmed TB initiated treatment within seven days of enrolment, compared to 3.3% in the control group. Average OOP costs were lower in the intervention group (USD 8.82) than in the control group (USD 13.61). Regression analysis further confirmed that the intervention significantly reduced overall OOP costs. Participants in the higher SES group (rich) experienced greater cost savings (USD -6.36 vs. USD -2.83), while those in lower SES group (poor) had a higher number of individuals initiating TB treatment within seven days of diagnosis (poor vs. rich: 36 vs. 10. Additionally,, the Incremental Cost-Effectiveness Ratio (ICER) per TB treatment initiated within seven days was more favourable for the lower SES group (ICER: 0.32) compared to the higher SES group (ICER: 0.81). **Conclusion:** The pooled results from both countries indicate that the intervention arm is associated with lower costs and improved health outcomes across all SES groups.* *Although many countries have implemented policies providing free access to TB services, patients in LMICs continue to face a substantial burden of OOP expenses associated with TB care. Decentralized TB testing has the potential to significantly reduce the time to diagnosis and to facilitate faster linkage to treatment, with many patients beginning TB treatment within seven days of diagnosis.* We discuss not only the results and implications of our findings, but also the challenges of collecting data in real-world clinical setting in rural Mozambique and Tanzania.

Ind-2432 The Cost of Human Immunodeficiency Virus (HIV) Viral Load Test in Indonesia

PRESENTER: **Mutia Astrini Pratiwi**, ThinkWell, LLC/USAID Health Financing Activity
AUTHORS: Diah Eva Sari Husnul Khotimah, Hasbullah Thabrany, Tri Indah Budiarty, Anastasia Susanto, Iko Safika, Nurhalina Afriana, Dini Kurniawati, Amalia Zulfah Wijaya, Endang Lukitosari

Background.

The Government of Indonesia (GOI) and the HIV community support efforts to achieve HIV/AIDS elimination agreed at the global level by 2030 to reach 95-95-95 targets. These targets – 95% of persons living with HIV (PLHIV) knowing their status, 95% of those diagnosed receiving antiretroviral treatment (ART), and 95% of those on treatment having suppressed viral loads (VL) - are pivotal in ending the epidemic by 2030. However, as of July 2024, these targets were 70%, 62%, and 42%, respectively. Currently, VL test administration is funded by a mixture of funding sources: the Global Fund, the Government (National and Subnational), and out-of-pocket payment. In anticipation of a decreasing international donor funding, the Government of Indonesia is preparing to cover VL test. Therefore, information on the VL test unit cost is needed to estimate the total budget to cover VL test for all PLHIV. Previous studies have limited generalizability due to small sample size and limited geographical areas representativeness. This study aims to estimate the unit cost of HIV viral load test with more representative samples, enabling more accurate result.

Method

We used a cross-sectional design focusing on the facility perspective. Primary data was collected through a survey of 41 health-care facilities across the 34 provinces in Indonesia, which is categorized as region 1 to 5. Activity-based costing (ABC) was utilized to calculate the unit cost per VL test. This approach considers costs associated with each step or activity involved in providing VL tests to patients. This includes patient registration, specimen collection, specimen processing, specimen testing, and results delivery. The survey took place in August – September 2023.

Results

12 (36%) facilities use high-capacity (HC) machines, and 29 (64%) facilities use small-capacity (SC) machines. SC machines were used in all types of healthcare facilities: private PHC facilities (3), private hospitals (5), public PHC facilities (10), public hospitals (9), and stand-alone public laboratories (2). HC machines were used in public hospitals (8) and stand-alone public laboratories (4) only. The average unit cost of VL test by HC machine was almost double the unit cost of VL test by SC machines at IDR 1,682,465, - and IDR 889,332, -; respectively. The lowest unit cost using the SC machine (IDR 797,687, -) was in region 3. While the lowest unit cost using a HC machine (IDR 1,355,963) was in region 1. Two main cost drivers for VL tests conducted by both machines were consumables and equipment.

Conclusion and recommendations

Our findings indicate that VL cost varies according to the type of machine, regional division, and type of healthcare facilities. This information helps determine the amount of reimbursement rate from the payer so that providers can be paid at cost. However, the ABC method tends to overestimate cost and therefore future studies using other method such as the double-distribution may be helpful to determine the most accurate unit cost. Adequate payment to provider based on the accurate unit cost will incentivize access expansion to VL test and eventually increase its coverage among the PLHIV.

3:30 PM –5:00 PM MONDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Lotus

Organisation, Management and Practice Change

MODERATOR: **Bruce Landon**,

Ind-605 Trends in Utilization of Mechanical Support During Percutaneous Coronary Interventions in the United States, United Kingdom, and Canada

PRESENTER: **Bruce Landon**, Harvard University
AUTHORS: Feng Qui, Olivia Haldenby, Dennis Ko, Peter Cram, Sharon Aroyo, Christina Fu, Mamas Mamas

Background: International comparisons can provide insights into how the financing of new medical technologies impacts their adoption and use over time. Microaxial flow pump (MAFP) and intra-aortic balloon pump (IABP) are costly technologies that are commonly used during percutaneous coronary interventions (PCI). Data supporting their effectiveness have been limited except for a recent trial demonstrating that MAFP is beneficial patients with ST-segment elevation myocardial infarction (STEMI) accompanied by cardiogenic shock. Information on the utilization of MAFP and IABP across different health systems and how use has changed over time since the introduction of MAFP is scarce.

Objective: To evaluate the adoption MAFP and the de-adoption of MAFP IABP in patients undergoing PCI in the United States (US), United Kingdom (UK), and Canada.

Methods: We performed a retrospective serial cross-sectional cohort study utilizing administrative and clinical data from the US, the UK (England and Wales), and Canada (Ontario). We studied adults aged ≥ 65 years who underwent PCI from January 1, 2012 to December 31, 2021 using population-level administrative data that captures all hospitalizations including diagnosis and procedure codes in the US and Canada; for the UK we used a clinical registry of all PCIs that we aligned with the administrative data from the other two countries. The primary outcomes were the utilization rates of MAFP and IABP over the study period, standardized by the annual number of PCI performed in each country. Device utilization was also examined in prespecified cohorts based on the main diagnosis.

Results: The median age of patients who received both types of mechanical support was ~75 years across all countries. There were higher utilization rates of both types of mechanical support in patients presenting with STEMI and cardiogenic shock in all countries. During the study period, the use of MAFP increased more than 7-fold in the US, from 60/10,000 PCI in 2012 to 443/10,000, while utilization in the UK and Canada remained low (< 10/10,000 PCI). While there was a substantial reduction in IABP use of 68% in the UK (from 206/100,000 to 66/100,000) and 29% in Canada (261/100,000 to 185/100,000) over the study period, the US had a slight increase in the utilization of IABP from 328/10,000 PCI in 2012 to 356/10,000 in 2021. Overall rates of mechanical support during PCI increased in the US from 388/10,000 to 799/10/000 while rates decreased in the UK (206/10,000 to 75/10,000) and Canada (149/10,000 to 99/10,000).

Conclusions and Implications for policy: The adoption and de-adoption patterns for two costly, highly-invasive cardiac devices differed substantially in the US relative to Canada and the UK. Current utilization of MAFP in the US was 40 times higher than in the UK and Canada. In addition, IABP use continued to increase in the US, sharply contrasting to the significant decline observed in other countries. Our results suggest that non-clinical factors related to incentives for use at both the hospital and physician level drive excess use in the US as compared to the UK and Canada.

Ind-667 Did Primary Care Teams Minimize the Impact of the COVID-19 Pandemic on Quality of Care? Evidence from Cancer Screenings in Ontario, Canada

PRESENTER: **Mehdi Ammi**
AUTHORS: Li Bai, Kim McGrail, Erin Strumpf, Walter Wodchis

Background: There is mixed evidence on the impacts of primary care teams (PCT), teams of interprofessional healthcare providers, in the health economics literature. Only some studies show improvement in the quality of care. Quality of care can be measured on different metrics, with preventive services delivery such as appropriate vaccination and screenings often used. Existing literature on the impacts of the COVID-19 pandemic suggests that disruptions in health care led to reduction in preventive services. It remains to be seen if PCT minimized the negative impact of the pandemic on these services.

Research question: Did primary care teams minimize the impact of the COVID-19 pandemic on cancer screenings?

Methods: We focused on the province of Ontario in Canada, the most populous province in the country. This province has a universal healthcare system and has largely implemented PCT models. We linked multiple Ontario health administrative databases to create a monthly panel dataset from January 2018 to December 2021. We selected a 25% random sample of all adult Ontarians, with a sample size of about 2.9 million individuals. We centered the analysis on the three main cancer screenings (colorectal, breast and cervical) and their eligible population. Furthermore, we focused only on those individuals who remained rostered with their PCT throughout to minimize confounding. We estimated difference-in-differences linear probability model regressions for each of these three outcomes to assess the impact of being enrolled in a PCT during the pandemic (starting March 2020). We extended this before-after model to allow for differential effects across the four COVID-19 waves covered in our timeframe. We furthermore explored heterogeneity across subgroups and assessed the reliability of a causal interpretation with event-study and placebo tests.

Results: PCT patients had higher cancer screening rates before the pandemic (from 10% to 13% more depending on screening) compared to non-PCT, however, being enrolled in a PCT during the pandemic led to a reduction in cancer screenings: from a 0.6% reduction in cervical and colorectal cancer screenings to a 1.1% reduction in breast cancer screening. There was no large variation in findings across COVID-19 waves, with an across-the-board relative reduction in screenings among eligible PCT patients for each wave. Subgroups analysis did not reveal any major difference in patterns – they were all negative with one exception: patients with multiple chronic conditions benefited from the PCT enrolment during the pandemic (+0.2% and +0.8% for colorectal and for cervical cancer screenings respectively). Event-study analyses confirmed the existence of common trends while placebo tests led to null results, both supporting the reliability of a causal interpretation of our findings.

Conclusion: Focusing on one aspect of quality of care (timely cancer screenings), we found that PCTs did not minimize the negative impacts of the pandemic, except for those with multiple chronic conditions. However, the size of the effect was small. Understanding whether PCT performed better during the pandemic than non-PCTs on other areas of quality of care, such as accessibility of care, is an important area for future investigations.

Ind-247 How Does Cooperation Among Outpatient Physicians Affect the Quality of Chronic Care?

PRESENTER: **Sophia Cordes**

AUTHOR: Tom Stargardt

Objectives: Existing literature shows, that inter-professional relationships between physicians can enhance health-related outcomes, in particular for chronically ill patients, who require complex treatment and interact frequently with multiple (outpatient) providers. These relationships (e.g. formalized as referrals) facilitate the exchange of information and the diffusion of innovation. However, studies on the link between the extent of cooperation and outcomes are still scarce. Against this background, this study addresses the research question: How does cooperation among outpatient physicians affect the quality of chronic care?

Methods: A social network analysis was conducted using claims data from the second largest sickness fund in Germany, the BARMER, between 2007 and 2019 for a large region (Berlin and Brandenburg). Based on referrals, we created physician networks weighted by the count of physicians' interactions (referrals). We computed network centrality measures on practice (node) level to describe cooperation, coordination and collaboration behaviour. In the analysis the mean interaction frequency of a general practitioner with other physicians (specialists) is used as a predictor for their patients' health outcomes. We addressed endogeneity of network measures to outcomes by employing a two-stage residual inclusion (2SRI) approach. A hurdle model was used for the outcome of hospitalization and a Cox proportional hazards model was applied for mortality, and an GLM for costs of care, combining these models with the instrumental variable strategy. In our sample we included newly diagnosed patients with congestive heart failure (CHF) and did a two-year follow-up. We controlled for patient morbidity using the Ontario Acute Myocardial Infarction Prediction Rules in combination with Elixhauser index. Also, we included several further patient characteristics (e.g. NYHA level and participation in DMP) and practice characteristics (e.g. experience and capacity) as covariates in the model.

Results: In the Berlin region, we did a follow-up of 23,367 CHF patients with a main GP assigned within our sample. Within the regression models we observe the behaviour of 2,176 main GPs in an dense outpatient provider network. Our results from the hurdle model show, that patients whose GPs show intensive cooperation and coordination effort are less likely to be hospitalised ($p=0.0016$). Furthermore, using Cox regression models, we also observe lower mortality rates ($p<0.0001$) for those GPs. In terms of costs, these coordinating and cooperating GPs show higher pharma costs ($p=0.056$), while at the same time reducing outpatient costs ($p<0.0001$). With focus on GP-cardiologist collaboration we see adverse outcomes here.

Discussion: The evidence from claims data suggest, that GP's network position, serving as a proxy for cooperation, coordination and collaboration behaviour, impact the health outcomes of patients with chronic diseases like CHF. Also, it is relevant to consider in terms of care efficiency. As one possible policy implication, we see a need to promote provider-led, primary care-based organizations and to evaluate financial incentive structures for collaborative efforts.

Ind-1890 Targeted Strategies to Reduce Readmission: Clustering Older Patients Combining Machine Learning and Expert Insights

PRESENTER: **Evora Hailin Zhu**

AUTHORS: Chuncheung Ching, April Yushan WU, Eng-kiong Yeoh, Susan Zi-may Yau, Lucy Xiaolu Wang

Background: Hospital readmissions among older patients are common and costly. Despite various intervention programs to reduce readmissions, effectiveness varied widely, partly due to delivering uniform care to patients with different health needs.

Aim: To classify older patients at risk of readmission into distinct clusters using machine learning and clinical expert evaluation, enabling more targeted intervention strategies. Effective readmissions management is crucial not only for improving patient outcomes but also for reducing healthcare spending by minimizing unnecessary costs.

Method: We conducted a retrospective cohort study using electronic health records (EHRs) from the public healthcare system in Hong Kong, covering all patients aged 65+ hospitalized between 2010-2018. Machine learning and clinical evaluation were combined to identify patient clusters that were clinically interpretable and recognized by clinical experts. We applied a two-stage hierarchical clustering algorithm to identify patient clusters among those with 30-day readmission, cross-validated by a different partitional clustering algorithm. Clustering characteristics included demographics, health conditions, healthcare utilization, and socio-economic factors. Clinicians assessed the clinical relevance of each cluster by reviewing key characteristics and comparing outcomes—including 90-, and 180-day readmission rates and mortality— across clusters and against non-readmitted patients. Then, clinicians validated and contextualized each cluster based on unique key characteristics and provided tailored recommendations.

Results: Among 537,125 older patients, 81,125 (15.10%) experienced readmissions within 30 days. Eight mutually exclusive patient clusters were identified and validated by clinical experts. The largest cluster (36,584; 45%) had fewer comorbidities than the non-readmitted but showed higher readmission and mortality at 90 and 180 days post-discharge. Clinicians attributed this to "hidden health risks" potentially not captured in the current risk factor data. Improved primary care was recommended for better detection of these risks. The second largest cluster (15,153; 19%) comprised elderly home residents with high rates of dementia and cerebral vascular accident (CVA), highlighting the need to address cognitive and physical care simultaneously. Other clusters include those with cardiopulmonary disease (10,856; 13%), diabetes with renal

diseases (7,197; 9%), liver diseases (4,341; 5%), advanced malignancy (3,160; 4%), and CVA with hemiplegia (2,759; 3%). Clinicians recommended tailored multimorbidity management for these five clusters with specific chronic conditions. The last cluster contains “frail elders” (1,075; 1%), who are heavy utilizers of inpatient care, had the longest average hospital stays and a high proportion of patients approaching end-of-life. Clinicians suggested palliative care instead of readmission reduction interventions for patients near end of life.

Implications: By integrating machine learning and clinical evaluation, we identified distinct patient clusters at risk of readmission, including those with hidden risks, elderly home residents requiring cognitive and physical care simultaneously, patients with multimorbidity, and frail elders approaching end of life. Targeted interventions tailored to the unique needs of each cluster have the potentials to significantly improve health outcomes while reducing unnecessary costs via readmission reduction. The next step of this research will involve designing and piloting targeted interventions for large patient clusters to evaluate their effectiveness in real-world clinical settings, where we plan to design cost diaries for a comprehensive cost-benefit analysis to inform policy.

3:30 PM –5:00 PM MONDAY [Health Care Financing & Expenditures]

os128 Bali International Convention Centre – Jakarta B

Financing Health Care in the Context of Climate Change Opportunities for Low Carbon and Resilient Health Systems

MODERATOR: **Sophie Witter**, Queen Margaret University, Edinburgh

CONVENER: **Josephine Borghi**, IIASA

abs-os186 Adjustments in Health Financing Policy to Contribute to Climate Mitigation and Adaptation in the Health Sector.

PRESENTER: **Maarten Oranje**, Cordaid
AUTHOR: Ms. Inke Mathauer

Background and objectives

The role of health financing policy to contribute to climate mitigation and adaptation in the health sector is slowly but increasingly being recognized and more and more development partners are integrating this perspective in their health financing work. Likewise, country policy makers also shift attention to the health financing domain. Yet, their health financing policy measures are hardly documented and assessed. At the same time, there is conceptual confusion between climate finance for the health sector and health financing policy for climate mitigation and adaptation.

This paper provides a conceptualization of the role of health financing policy for climate mitigation and adaptation as one specific area within climate financing for health. The objective is to identify and assess the core policy measures in the three health financing functions of revenue raising, pooling and purchasing that can contribute to climate mitigation and adaptation. Various examples from low-, middle- and high-income countries are provided to illustrate these measures.

Method

Building on the WHO health financing progress matrix, we used a deductive approach exploring how health financing policy instruments can be modified to contribute to climate mitigation and adaptation. This was combined with a rapid literature review to sharpen this conceptualization and to identify country practices.

Results

The analysis shows that all the health financing functions can be adjusted in such a way that they contribute to low carbon health systems. However, most measures are found within the purchasing function. Provider payments, contracting and accreditation serve to set financial incentives for providers to adapt service provision and prescription behaviour as well as procurement processes. So far there are few country experiences of health financing policy for climate mitigation and adaptation that are documented and assessed.

Likewise, for the health sector to be able to cope with climate stress and shocks, health financing instruments can be modified to support health sector adaptation. While this calls for new revenue raising approaches and revised pooling arrangements (including the use of flexible risk equalization or risk adjustment mechanisms), again many of the necessary adjustments concern the purchasing function, such as revisions in benefit package and cost-sharing mechanisms to cater to changing health needs under climate stress and shock situations. In various cases, health financing measures for adaptation equally have a mitigating effect.

Conclusion

This conceptualization and country practice demonstrate that health financing policy instruments can be designed in such a way, by setting appropriate incentives and disincentives, that negative effects on the climate and environment are minimized, while positive contributions to climate resilient health systems are optimized. Importantly, all health financing measures for climate mitigation and adaptation are in line with and further underline existing UHC oriented policy guidance.

It is critical for countries to start with the low-hanging fruit, i.e. measures that can be implemented without large investments. Awareness and political will are decisive to leverage the role of health financing policy for climate mitigation and adaptation. More research and country assessments will be needed to promote peer learning in this field.

abs-os188 Climate Finance Opportunities for Health Systems Financing.

PRESENTER: **Ms. Josephine Borghi**
AUTHORS: Agnes Soucat, Giulia Gasparri, Blanca Anton, Soledad Cuevas Garcia-Dorado, Domenico Gerardo, Mark Hanson, Flavia Bustreo, Etienne Langlois

Background: Climate finance can offer opportunities for the health sector as a source of funds and a means of risk reduction. Climate finance refers to finance activities and instruments originating outside of the health sector for mitigation - reducing carbon emissions, or adaptation - investments to reduce vulnerability to climate change, or to address climate loss and damage. This presentation reviews existing climate finance mechanisms and their potential to support health systems, exploring their capacity to generate resources, enhance sustainability, and build resilience in health systems. We also examine the challenges of integrating climate and health financing instruments.

Methods: We conducted a narrative review, focusing on climate finance mechanisms including multilateral funds, voluntary market-based mechanisms, taxes, fossil fuel subsidy removal, microlevies, and adaptive social protection. A search of the literature from 2013-2023, including PubMed, Web of Science, and grey literature, identified 40 studies. The review synthesized evidence on financing arrangements, health system potential, and implementation challenges.

Results:

Multilateral funds support climate mitigation and adaptation but have limited allocation to health. Between 2009-2019, only 5.7% of multilateral adaptation finance (US$ 522 million) went to health, far less than sectors like energy or agriculture. Barriers to accessing these funds include the lack of accredited health institutions and the need for more targeted funding for vulnerable countries. The Climate Loss and Damage Fund may address health impacts from climate hazards, but uncertainties about its operationalization remain.

Carbon credits fund health-related projects like clean cookstoves, water treatment, and forest fire management by monetizing avoided emissions. While carbon credits can mobilize private sector funding, challenges such as market volatility, transparency, and alignment with health goals (e.g., unsafe water treatment for carbon credit income) require careful design and monitoring.

Taxes (such as on carbon emissions) and microlevies (e.g., airline taxes) can generate revenue for health and contribute to emissions reductions. However, there are concerns about stability of revenues from taxes on carbon emissions and the potential perverse incentives for emission reduction in the longer term. Microlevies offer predictable and long term funding, but funds generated tend to be limited and are vulnerable to economic fluctuations. Adaptive social protection can mitigate climate risks by improving healthcare access for displaced populations and incentivizing mitigation actions (e.g., installing solar panels). These mechanisms can be crucial for reducing the health impacts of climate hazards at the local level, but this needs to be weighed against the risk of prematurely burdening new and developing programs with multiple objectives. We found few empirical examples of integrative health and climate co-financing. To be effective, information systems need to be linked, and dependencies between health and climate risks quantified.

Conclusion: Leveraging climate finance for health is vital to addressing the funding gap for health sector mitigation and adaptation, aligning with global climate funding pledges from the recent COP. Our review highlights the potential and limitations of various climate finance mechanisms and underscores the need for more research to optimize their impact on health systems.

abs-os183 The Effect of Extreme Weather Events on Financial Protection in Zambia.

PRESENTER: **Chitalu Chama Chiliba**
AUTHORS: Cherie Part, Dell Saulnier, Richard Bwalya, Moses Chisola, Ms. Josephine Borghi

Background: Extreme weather events are increasingly frequent due to climate change, posing risks to health financing, particularly in resource-poor settings still progressing toward universal health coverage. These events can impact income and livelihoods, reducing the affordability of healthcare. Severe floods may displace populations to areas lacking financial protection. Disruptions to roads, transport and medical supply chains can also affect the costs of care-seeking. Facility operations may suffer, prompting patients to seek alternative, more expensive, care. While extreme weather events likely affect financial protection, few studies have examined these impacts.

Aim: This study examines how floods and heatwaves affect healthcare costs and financial protection in Zambia, assessing catastrophic health expenditure and impoverishment impacts using secondary data.

Methods: We use Zambia Living Conditions Monitoring Survey data from 2010, 2015, and 2022, to measure household health and total consumption expenditure. Outcomes for the analysis include: total health expenditure; incidence of catastrophic expenditure at 10% and 25% thresholds of household consumption; and impoverishment (based on Zambia's poverty line, international poverty lines of USD 1.90, 2.15, and 3.20, and relative poverty at 60% of median per capita consumption). Household data are linked to climate exposure data based on survey cluster geo-coordinates. A household is considered to be flood-exposed if water is present within a 2 km² radius of the household, or within a 2km (urban) or 5km (rural) catchment area of its nearest health facility, with flood intensity measured by extent of water coverage. Floods are identified by comparing satellite data and water reference maps via NASA's MODIS Global Flood Product and the Global Surface Water

database. Heatwave exposure, identified using ERA5-Land re-analysis data, is defined as three or more consecutive days above the 90th, 95th, and 99th percentiles of daily maximum temperatures during the three hottest months of the year (reference period: 1990-2019), with annual heatwave frequency also recorded. We analyse the effects of floods and heat on outcomes using linear fixed effects panel regression models with time and district/cluster fixed effects controlling for household characteristics. We assess heterogeneity in exposure effects by distance to urban centers, socio-economic and health insurance status. We also explore whether effects are mediated by changes in income, household displacement, injury, or care seeking for flood/heat-sensitive conditions.

Key Results: We present relationships between flood/heatwave exposure and healthcare costs, catastrophic expenditure, and impoverishment in Zambia, identifying temperature and flood intensity thresholds for these effects. We also show differential effects across subgroups, identifying those most at risk, and explore mediators of effect.

Conclusions: Understanding how weather extremes affect household financial protection can guide adaptations to health financing arrangements, to ensure services remain affordable in the wake of extreme weather events, through targeted waivers or benefit package adjustments.

3:30 PM –5:00 PM MONDAY [Demand & Utilization Of Health Services]

os165 Bali International Convention Centre – Jakarta A

The Use and Usefulness of Discrete Choice Experiments in Shaping Healthcare Policy: A Global Perspective

MODERATOR: **Jason J. Ong**, Melbourne Sexual Health Centre, Alfred Health, The School of Translational Medicine, Monash University, Melbourne

CONVENER: **Yuanyuan Gu**, Macquarie University, Sydney

abs-os318 Eliciting Practitioner Preferences when Selecting Infection Prevention and Control Practices for the Prevention of Healthcare Associated Infections

PRESENTER: **Shalini Elangovan**

AUTHORS: Sameera Senanayake, Nicholas Graves, Sanjeewa Kularatna

Background

Hospital acquired infections worsen patient outcomes and increase healthcare costs. Infection prevention and control professionals must select practices to keep hospital acquired infections to a minimum, but this decision-making process is not well-described.

Aim

This study aims to use a discrete choice experiment to evaluate practitioner preferences when selecting infection prevention and control practices for hospital acquired infections.

Methods

A discrete choice experiment consisting of four phases was conducted. Firstly, attributes of infection prevention and control practices were established using literature reviews and expert opinion. Secondly, choice tasks were generated using a Bayesian *d*-efficient design and were combined with screening and demographic questions to structure the discrete choice experiment. Pre- and pilot tests were conducted to ensure understandability of the choice tasks and to generate prior values to inform the final design. Thirdly, the discrete choice experiment was administered online to infection prevention and control professionals. Lastly, a mixed multinomial logit model and a latent class model, followed by the relative importance of attributes and a scenario analysis, were estimated.

Results

Four attributes with three levels each were used: the quality of clinical evidence supporting an infection prevention and control practice, the amount of time it will take to implement the practice, economic costs and benefits associated with the practice, and the additional amount of time it will take healthcare professionals per patient to carry out the practice. 256 infection prevention and control professionals completed the discrete choice experiment. The mixed multinomial logit model revealed the following attribute levels to be preferred by respondents in general: systematic reviews and RCTs as clinical evidence, 3 months to implement, small investment with large health returns, and an additional 5 minutes per patient. A latent class analysis revealed 2 distinct classes. The first class, termed Evidence Seekers, was more likely to comprise respondents from low- and middle-income countries with a research-focused role who participate more in decision-making, while the second class, coined Efficiency Seekers, was more likely to consist of respondents from high-income countries with a more clinical role who participate less in decision-making. In a relative attribute importance analysis, Evidence Seekers valued the quality of clinical evidence the most, while Efficiency Seekers valued the economic costs and benefits of the IPC practice the most. In scenario analyses, Evidence Seekers demonstrated consistently high uptake probabiltities of real-world infection prevention and control practices regardless of attribute level combinations compared to Efficiency Seekers.

Conclusion

Distinct priorities among infection prevention and control professionals from low- and middle-income and high-income countries highlight the need to support incorporation of economic evidence in decision-making across settings to maximise health outcomes and resource use.

abs-os306 Medical Brain Drain - Assessing the Role of Job Attributes and Individual Traits

PRESENTER: **Marco Bertoni**
AUTHORS: Yuanyuan Gu, Debdeep Chattopadhyay

Background: Economic research has extensively examined the "brain drain" from low- to high-income countries, but less attention has been paid to the movement of skilled workers between high-income nations. This study contributes to this area by exploring the migration intentions of Italian medical students, with a particular focus on their preferences for domestic versus foreign job opportunities. The emigration of physicians from Italy affects healthcare quality and imposes fiscal costs, as their training is publicly funded.

Aim: We explore three questions: (1) Do future doctors prefer domestic jobs over comparable jobs abroad? (2) Do these preferences vary based on personal characteristics? (3) How do job preferences differ between domestic and international jobs?

Methods: We designed a Discrete Choice Experiment where Italian medical students chose between pairs of hypothetical job offers, differing by six attributes: professional development opportunities, income, job security, working conditions, skill match, and the country of the job. The study's challenge was isolating job market-related attributes from country location. In the survey, students were initially asked to name their preferred foreign European country. When thinking about this country, we prompted students to focus on non-labor aspects that attract them. We then presented students with job options located either in Italy or their preferred foreign country. Data were collected from 2020 to 2021 through an online survey of 527 senior medical students at 12 Italian universities. The survey also included questions on students' backgrounds and personality traits. Using mixed logit models (main effects, interaction between attributes, interactions with covariates) and adjusting for sample representativeness through entropy balancing, we analyzed students' willingness to pay (WTP) for job attributes.

Results: We found that students are willing to forgo €13,515 in annual income to work in Italy, although preferences vary significantly. Roughly one-sixth of students would sacrifice an average of €7,841 to work abroad. Students with higher levels of cognitive skills, altruism, risk tolerance, and competitiveness are more inclined to move abroad. These findings suggest that medical migration negatively impacts the quality of the remaining pool of doctors. We found notable differences in WTP for job features between domestic and international jobs. Students showed a high WTP for permanent contracts in Italy but were more open to temporary contracts abroad. They also placed a greater value on professional development and skill alignment in foreign jobs, likely due to the challenges of adapting to a new institutional environment.

Policy implications These results have significant implications for understanding the drivers of medical migration and for designing job contracts that help retain doctors in countries facing potential shortages. As most young Italian doctors are willing to trade higher pay for better working conditions and development opportunities at home, this suggests that Italy's medical brain drain is driven largely by unmet job quality expectations rather than salary alone. Furthermore, the preference for temporary migration suggests policies such as tax incentives for returnees could encourage the re-entry of Italian doctors trained abroad.

abs-os321 Men Under the Radar : Understanding Their Preferences for Suicide Prevention Services to Increase Uptake and Effectiveness

PRESENTER: **Yuanyuan Gu**, Macquarie University
AUTHORS: Alexis Whitton, Katherine Boydell, Anam Bilgrami, Helen Christensen, Fiona Shand, Noura Saba, Aimy Slade, Henry Cutler, Dandan Yu

Background: Suicide is a critical public health issue in Australia, claiming 8.6 lives daily - twice the number lost to road accidents. Men are disproportionately affected, representing three out of every four suicides. Despite this high prevalence, 58% of men experiencing suicidality do not seek formal support, leaving them 'under the radar'. Existing studies on men's engagement with suicide prevention services have largely focused on attitudes and stigma, but little is known about their needs and preferences for specific service attributes.

Aims: This study quantifies the preferences of men who remain 'under the radar' for suicide prevention services, identifying pathways to enhance service uptake. The target group was defined as men aged 18 or older, fluent in English, residing in Australia, who had experienced suicidality in the past six months but had no contact with formal mental health care services.

Methods: A discrete choice experiment (DCE) was used to elicit preferences. Service attributes and levels were developed through a literature review and refined by interviews with men with lived experience (N=7). Final attributes included out-of-pocket cost (first session), service type (online self-help, peer support, formal mental health care/support), service mode (online, phone, face-to-face), waiting time, availability, service environment (individual or group), and service linkage (e.g., to support with employment, finances, housing, or relationships). A D-efficient design generated 12 choice sets per respondent, with each set containing two hypothetical service plans and an opt-out option. Data were collected from July 2023 to November 2024 through an online survey using purposive sampling, with participants recruited via university and social media platforms. Analysis was conducted using mixed logit models to derive Willingness to Pay and Relative Importance (RI) estimates, supplemented with scenario analysis to evaluate pathways for improving service uptake.

Results: After assessing data quality, responses from 398 participants (mean age 42.4; 57.8% urban; 33.2% single) were retained for analysis. Results indicate that all attributes significantly influenced choice. Cost was the most impactful factor (RI: 47), followed by waiting time (RI: 18), with respondents willing to pay around 300 AUD to reduce waiting time from 3 months to zero. Service type and environment were also important (RI: 15 and 11), with a preference for professional, one-on-one services. Respondents favoured services that are face-to-face,

available 24/7, and linked with additional supporting services; however, service mode, availablity, and linkage were relatively less important drivers of choice (RI: 5, 3, and 2). Preference heterogeneity was significant; for example, those seeking help with emotional regulation were more likely to engage with services, while lower-income respondents were more cost-sensitive. Scenario analysis indicated a near-zero probability of uptake for a service with the least preferred attribute levels, which increased to 99% with the most preferred attribute levels.

Policy Implications: This study highlights how aligning suicide prevention services with men's preferences can improve their uptake and effectiveness. Incorporating these insights into service design can help policymakers enhance engagement and optimise resource allocation in suicide prevention.

abs-os314 Preferences of Adolescents and Young Adults for Sexual and Reproductive Health Services in Ethiopia: A Discrete Choice Experiment

PRESENTER: **Melaku Birhanu Alemu**
AUTHORS: Richard Norman, Yuanyuan Gu, Tigest Tamrat, Daniel Gashaneh Belay, Jaya Dantas, Gavin Pereira, Gizachew A. Tessema

Background: Adolescents and young adults (AYAs) face significant sexual and reproductive health (SRH) challenges, including unintended pregnancy, unsafe abortion, and sexually transmitted infections in Ethiopia. However, SRH service utilisation remains low. One of the potential reasons could be the misalignment of SRH services with AYA needs. There is limited evidence on AYAs preference for SRH services in Ethiopia. **Aim**: We aimed to assess the preferences of AYAs (aged 15 to 24) for SRH services in Ethiopia. **Methods**: We conducted three distinct but interrelated discrete choice experiments (DCEs) on contraceptive services, abortion care, and sexually transmitted infection (STI) services between February and April 2024. A literature review, focus group discussions with a ranking exercise among AYAs, and expert discussion were conducted to identify six attributes (privacy, cost, distance, health provider attitude, service quality and cleanliness). A D-efficient design with two blocks, each containing 12 choice tasks, was constructed using Ngene software. Stratified sampling methods were used to select participants. The survey was collected electronically using REDCap. A mixed logit model was used to estimate attribute importance, willingness to pay, choice probabilities, and preference heterogeneity. Analyses were weighted to improve representativeness and comparability. **Results**: A total of 984, 990, and 990 participants completed the contraceptive, abortion care, and STI DCEs, respectively. Privacy was the most important attribute for contraceptive and abortion care, while quality of care dominated in STI services. There were preference variations among sociodemographic characteristics. Respondents from rural and regional areas prioritised privacy, whereas participants from urban and metropolitan areas valued high-quality care. Under optimal service conditions, the predicted uptake of SRH services could reach as high as 95%. In contrast, under unfavourable conditions, the uptake rate could decline substantially, falling to as low as 10%. Participants were willing to pay an additional US$54 to avoid receiving low-quality STI services. Likewise, respondents were willing to pay (2,302 ETB/US$42) to protect privacy for STI services, followed by contraceptive services (2,031 ETB/US$38) and abortion care (1,870 ETB/US$34). **Conclusions and policy implications**: AYAs have significant preferences for the attributes (privacy, cost, distance, health provider attitude, health service quality and cleanliness of the facility), with privacy and service quality emerging as the most important attributes for all SRH services. Privacy was particularly prioritised for abortion care, while service quality was most important for STI services. Notable variations in preferences were observed across different sociodemographic groups, highlighting the need for context-specific interventions to maximise service utilisation.

3:30 PM –5:00 PM MONDAY [Health, Its Valuation, Distribution And Economic Consequences]

os173 Bali International Convention Centre – Medan

Explore the Growing Financial Burden of NCD and How Health Systems Can Adapt

MODERATOR: **Fikriansyah Fikriansyah**, Novo Nordisk Indonesia

CONVENER: **Royasia Viki Ramadani**, Center for Health Economics and Policy Studies, Universitas Indonesia

DISCUSSANT: **Siti Nadia Tarmizi**, Director of Non-Communicable Disease Prevention and Control, Ministry of Health RI

abs-os383 Budget Impact Analysis for Initiating Insulin Therapy for Type 2 Diabetes Mellitus Patients Under the National Health Insurance Program in Indonesia

PRESENTER: **Zahrina Laborahima**
AUTHORS: Gemala Chairunnisa Puteri, Dhia Ticha Pertiwi, Royasia Viki Ramadani, Budi Hidayat, Ketut Suastika, Soebagijo Adi Soelistijo, Tri Juli Edi Tarigan

Background: Type 2 Diabetes Mellitus (T2DM) is a leading global health concern, affecting approximately 536.6 million individuals worldwide and imposing significant healthcare costs. In Indonesia, the prevalence of T2DM among adults was 19.5 million in 2021 and is expected to rise by 46% by 2045. This study aims to assess the financial impact of shifting insulin initiation from hospitals to PHC within the NHI system, considering the potential for reduced costs and improved patient outcomes.

Objective: This study seeks to quantify the cost implications of transitioning insulin therapy for T2DM patients from a hospital-based approach to a primary healthcare (PHC)-based approach and evaluate its potential for improving both the financial sustainability of the NHI system and the quality of care for T2DM patients in Indonesia. The research question is: *What is the budget impact of initiating insulin therapy for T2DM patients at PHC compared to the current hospital-based approach under Indonesia's NHI program?*

Methods: A prevalence-based Budget Impact Analysis (BIA) model was developed to estimate the costs associated with insulin initiation using basal and premix insulin modalities at PHC versus hospitals. The model incorporates data from Indonesia's NHI claims database, including T2DM patient records, treatment protocols, insulin usage patterns, and related healthcare expenditures. The model assumes that insulin initiation at PHC would only apply to patients without complications and that insulin would be prescribed based on HbA1c ≥7.5%. Costs were derived from 2019 NHI data, adjusted for inflation to 2024 figures, and converted to USD for clarity. Direct medical costs were analyzed from the perspective of the NHI, considering both capitation and fee-for-service payment structures at PHC and hospital settings.

Results: Findings suggest that shifting insulin initiation to PHC could reduce the total medical costs for T2DM patients significantly. Over a 5-year period (2024-2028), the total cost for basal insulin initiation in hospitals is estimated at US $3.674 billion, while transitioning insulin initiation to PHC could reduce this to US $3.308 billion, resulting in savings of US $367 million. Similarly, for premix insulin, the cost decreases from US $3.901 billion to US $3.535 billion with a potential savings of US $367 million. Sensitivity analyses confirm the robustness of these results, showing that the shift to PHC remains cost-effective even with variations in key assumptions, such as patient volume and complication rates.

Conclusions: The study concludes that transitioning insulin initiation to PHC is both a financially sound and clinically beneficial strategy. The shift would reduce hospital-related costs and improve access to timely insulin therapy, potentially enhancing clinical outcomes by reducing HbA1c levels and preventing complications. The findings have important policy implications, suggesting that Indonesia's healthcare system could benefit from reallocating resources to PHC, improving diabetes management, and aligning with the country's health transformation agenda. This shift may also support broader efforts to integrate non-communicable disease (NCD) management into primary care and reduce the burden on hospital services.

abs-os366 Direct Medical Cost of Type 2 Diabetes Mellitus and Its Associated Complications in Indonesia

PRESENTER: **Budi Hidayat**, Universitas Indonesia
AUTHORS: Ketut Suastika, Pradana Soewondo, Achmad Rudijanto, Junice Ng, Royasia Viki Ramadani

Background: Diabetes, particularly Type 2 Diabetes Mellitus (T2DM), is a major public health issue globally, with Indonesia experiencing one of the highest prevalences worldwide. In 2019, an estimated 10.7 million people in Indonesia were diagnosed with diabetes, a number projected to rise to 16.6 million by 2045. Uncontrolled T2DM leads to various complications, increasing morbidity, mortality, and healthcare costs. While previous studies have highlighted the burden of diabetes-related complications, there is a lack of comprehensive data on the direct medical costs of T2DM and its complications within Indonesia's national health insurance system, Jaminan Kesehatan Nasional (JKN). This study aims to fill that gap by analyzing the direct medical costs associated with T2DM and its complications across Indonesia.

Objective: The primary objective of this study was to estimate the direct medical costs of managing T2DM and its complications in Indonesia, using data from the JKN database. Specifically, the study sought to assess the costs incurred by individuals with diabetes-related complications and identify the key drivers of healthcare expenditure.

Methods: A retrospective cohort study was conducted using 2016 data from the JKN database. The study included individuals aged 30 years and older diagnosed with T2DM (ICD-10 codes). Seven diabetes-related complications were considered: cardiovascular disease, nephropathy, neuropathy, retinopathy, cerebrovascular disease, peripheral vascular disease, and iatrogenic hypoglycemia. Direct medical costs—encompassing inpatient hospitalizations, outpatient specialist visits, and medications under the non-capitated fee-for-service payment model—were calculated from a payer's perspective. A prevalence-based approach was used to estimate the total costs for the year. Statistical analyses were performed using Stata version 15.

Results: Of the 18.9 million JKN members who accessed secondary and tertiary healthcare services, 812,204 (4%) were diagnosed with T2DM. Among these, 57% had at least one complication. The mean annual direct medical cost per person was US $708, with those having complications incurring significantly higher costs (US $930) compared to those without complications (US $421). The most common complications were cardiovascular diseases (24%), neuropathy (14%), and nephropathy (7%). Inpatient hospitalization was the largest cost driver, accounting for 55% of the total costs. The total direct medical cost for managing T2DM and its complications in 2016 was estimated at US $576 million, with 74% of these costs attributed to individuals with complications. Cardiovascular diseases and nephropathy were the most-costly complications, accounting for US $236 million and US $129 million, respectively.

Conclusions: This study highlights the significant economic burden of T2DM and its complications on Indonesia's healthcare system. Individuals with complications incur substantially higher healthcare costs, particularly due to inpatient care. Early detection and effective management of T2DM, especially at the primary care level, are essential to reduce long-term healthcare expenditures. Strengthening primary care infrastructure, including empowering healthcare providers to initiate insulin therapy and manage complications more effectively, is critical. Policymakers should use these findings to inform healthcare resource allocation, reforms, and strategies aimed at improving diabetes care and control across the population.

abs-os396 Estimating the Direct Medical and Indirect Costs of Non-Communicable Diseases in Indonesia

PRESENTER: **Septiara Putri**
AUTHORS: Afra Inayah Dhyaniputri, Royasia Viki Ramadani, Budi Hidayat

Background: Non-communicable diseases (NCDs), including cardiovascular diseases, cancer, and diabetes, account for 63% of all deaths in Indonesia. Despite their significant health and economic impact, there is limited data on the economic burden of NCDs in the country, particularly in terms of healthcare costs and their consequences on financial sustainability of the national health insurance system (JKN). This gap in knowledge impedes effective policy development aimed at managing the rising burden of NCDs. This study addresses this critical gap by

estimating the direct and indirect costs of NCDs in Indonesia, using data from the 2023 JKN claims database; or use sample data and apply longitudinal, focus on Direct medical cost only).

Objective: The main objectives of this study are to assess the prevalence of Non-Communicable Diseases (NCDs) among claimants under Indonesia's JKN program, and to examine the rates of complications associated with these diseases and their impact on healthcare costs within the system. Additionally, the study aims to analyze how demographic and clinical factors influence medical expenditures for NCD patients in the JKN program. Finally, the research seeks to quantify both the direct and indirect costs associated with NCDs, providing valuable insights into the overall financial burden of these diseases on the JKN system.

Methods: The study employs a retrospective analysis of 2023 JKN claims data for individuals aged 18 and older. The data includes information on NCD diagnoses (cardiovascular diseases, cancer, diabetes), complications, comorbidities, medications, medical costs (outpatient and inpatient), length of stay, and mortality-related costs. Descriptive statistics will be used to summarize patient demographics and resource utilization, while multivariate regression analysis will explore associations between demographic and clinical variables and medical expenditures. To estimate indirect costs, including productivity losses due to absenteeism, permanent disability, and premature mortality, a human capital approach is applied, incorporating data on lost workdays, income levels, and mortality rates.

Results: Preliminary results indicate that NCD complications significantly increase healthcare costs, with NCDs representing 22% of the total claims under the INA-CBG payment system, despite comprising only 7.3% of the JKN patient population. Additionally, the indirect costs of NCDs—due to productivity losses and premature mortality—add a substantial economic burden that is often underreported in conventional cost-of-illness studies. These findings suggest that the true economic impact of NCDs is far greater than traditional estimates, emphasizing the need for more comprehensive cost assessments.

Implications: The study's findings have important implications for policy and practice. The rising financial burden of NCDs on the JKN system necessitates a reevaluation of resource allocation and funding strategies. By quantifying both direct and indirect costs, this research provides essential evidence for policymakers to improve health financing, optimize resource use, and address the growing burden of NCDs. The results highlight the importance of integrating NCD-related costs into health policy and planning, promoting preventive measures, and ensuring equitable access to healthcare services, especially for populations at higher risk.

abs-os403 The Impact of Multimorbidity Among Adults with Cardiovascular Diseases on Healthcare Costs in Indonesia

PRESENTER: **Royasia Viki Ramadani**
AUTHORS: Mikael Svensson, Sven Hassler, Nawi Ng, Budi Hidayat

Background: Cardiovascular diseases (CVDs) are the leading cause of death in Indonesia, accounting for 38% of the total mortality in 2019. Moreover, healthcare spending on CVDs has been at the top of the spending under the National Health Insurance (NHI) implementation. This study analyzed the association between the presence of CVDs with or without other chronic disease comorbidities and healthcare costs among adults (> 30 years old) and if the association differed between NHI members in the subsidized group (poorer) and non-subsidized households group (better-off) in Indonesia.

Methods: This retrospective cohort study analyzed the NHI database from 2016–2018 for individuals with chronic diseases (n = 271,065) ascertained based on ICD-10 codes. The outcome was measured as healthcare costs in USD value for 2018. We employed a three-level multilevel linear regression, with individuals at the first level, households at the second level, and districts at the third level. The outcome of healthcare costs was transformed with an inverse hyperbolic sine to account for observations with zero costs and skewed data. We conducted a cross-level interaction analysis to analyze if the association between individuals with different diagnosis groups and healthcare costs differed between those who lived in subsidized and non-subsidized households.

Results: The mean healthcare out- and inpatient costs were higher among patients diagnosed with CVDs and multimorbidity than patients with other diagnosis groups. The predicted mean outpatient costs for patients with CVDs and multimorbidity were more than double compared to those with CVDs but no comorbidity (USD 119.5 vs USD 49.1, respectively for non-subsidized households and USD 79.9 vs USD 36.7, respectively for subsidized households). The NHI household subsidy status modified relationship between group of diagnosis and healthcare costs which indicated a weaker effect in the subsidized household group (β = -0.24, 95% CI -0.29, -0.19 for outpatient costs in patients with CVDs and multimorbidity). At the household level, higher out- and inpatient costs were associated with the number of household members with multimorbidity. At the district level, higher healthcare costs was associated with the availability of primary healthcare centres.

Conclusions: CVDs and multimorbidity are associated with higher healthcare costs, and the association is stronger in non-subsidized NHI households. Households' subsidy status can be construed as indirect socioeconomic inequality that hampers access to healthcare facilities. Efforts to combat cardiovascular diseases (CVDs) and multimorbidity should consider their distinct impacts on subsidized households. The effort includes affirmative action on non-communicable disease (NCD) management programs that target subsidized households from the early stage of the disease.

os194 Bali International Convention Centre – Karangasem

Economics of Telemedicine and Telehealth: Evidence from China and the US

MODERATOR: **M. Mahmud Khan**, College of Public Health, University of Georgia

CONVENER: **Zhuo Chen**, University of Georgia

DISCUSSANT: **Shanquan Chen**, International Centre for Evidence in Disability, London School of Hygiene & Tropical Medicine

abs-os509 Association Between Hospital Leadership Characteristics and Engagement in Online Dual Practice for Physicians in China

PRESENTER: **Mr. Zhuo Chen**, University of Georgia
AUTHORS: Qing-Ping Ma, Duo Xu, Xuyan Lou, Lina Song, Hongqiao Fu, Xuening Cheng

A rising number of online healthcare platforms have emerged in China, facilitating health professional especially public hospital doctors to provide patients with on-demand remote health care primarily via telephone and video-conferencing software. This combination of public hospital doctors serving on privately funded online health platforms creates the **online dual practice** for public hospital doctors. This new practice might be encouraged or discouraged by public hospital leaders since it may generate distinct unintended consequences for public hospitals and there may exists a conflict of interests between doctors and hospitals. Given the important role of hospital leaders highlighted by the Upper Echelons Theory (UET) and the context of Chinese health system, this study addresses the research question on how hospital leadership characteristics affect online dual practice adoption and online health service provision among doctors. It explores the association between public hospital leader's characteristics and doctor's engaging in online dual practice. This study integrates unique database at three levels: leadership characteristics of hospital CEOs, information on doctors providing outpatient services, and on doctors providing telemedicine service through online health platforms. Logistic regression models are used to investigate the association between hospital CEOs' background and doctor's engagement in online dual practice at doctor's level, and linear regression models are used to test the effect of hospital leadership on the extent of online service provision at hospital level. Results showed that hospital leaders' age, seniority and educational level can positively affect doctor's adoption of online dual practice and their provision of online service. However, a long tenure of leaders worked in this hospital is unfavourable to the promotion of online dual practice, but can encourage those online doctors to provide more online consultations. Leaders who having overseas experience and management background are less encouraged to doctor's adoption of online dual practice, but become more supportive to online doctors rendering online services. In addition, a large heterogeneity effects are found across different clinical departments. Our findings offer important policy implications for designing appropriate policies and training programs for public hospital leaders to promote the adoption of online dual practice and mitigate potential adverse consequences of it.

abs-os446 Impacts of Platform Endorsement in Online Healthcare: Evidence from China

PRESENTER: **Hongqiao Fu**
AUTHORS: Xu Zhang, Jiajia Zhan

Impacts of platform endorsement in online healthcare: Evidence from China

Abstract:

Online healthcare platforms enhance healthcare access and equity by removing geographic barriers and facilitating doctors to serve underprivileged patients. However, they exacerbate information asymmetry due to the vast number of doctors available online. To mitigate this and to motivate leading doctors to improve their practices, platforms have introduced endorsements, awarding select doctors badges for exceptional performance. This study investigates the impact of platform endorsement on both patients' demand and doctors' decisions on pricing, quantity, the mix between free and paid services, and quality by exploiting a leading Chinese platform's "Good Doctor of the Year" endorsement program. Using the Generalized Synthetic Control method, we find that endorsement boosts demand for endorsed doctors, who respond by increasing prices and provision of paid services while maintaining service quality. However, we find that endorsement leads to an unintended consequence of a decrease in free services provided by endorsed doctors, thereby disadvantaging underprivileged patients. Notably, this reduction in free services is more pronounced among "pro-social" doctors due to their reluctance to raise prices and limited capacity. These findings highlight the need for platforms and policymakers to understand the nuanced impacts of information disclosure on doctors' decisions and the potential unequal effects across different groups of patients in online healthcare, a sector with significant societal implications.

Keywords: online healthcare, platform endorsement, doctor consultations, paid services, free services

abs-os502 Social Determinants of Telemedicine Use: Evidence from Georgia Fee for Service Medicare Beneficiaries, 2018-2019

Telemedicine has played a critical role in providing much-needed services to hard-to-reach patients in remote areas and vulnerable populations during the pandemic. However, telemedicine utilization is limited by factors including access to high-speed internet, preference, access, and perception of privacy protection and convenience associated with telemedicine provision. This study aims to examine the disparities in telemedicine utilization and associated social determinants of health. We linked claims data for fee-for-service Medicare beneficiaries in the state of Georgia in 2018-2019 with the zipcode-level social determinants of health indicators constructed by the Agency for Healthcare Research and Quality. We excluded beneficiaries eligible for Medicare due to reasons other than old age. A total of 808,141 beneficiaries were

included, with 54.4% of them being women, 80.5% living in an urban area, and 11.0% eligible for Medicaid as well. Telemedicine use was determined by examining a combination of telemedicine site codes and the Current Procedure Terminology codes. Preliminary analyses suggest significant rural-urban disparities in the use of telemedicine, likely due to access to high-speed internet and access to a provider to initiate telemedicine. Further analyses of the association between zipcode-level determinants and telemedicine use will provide insights for future intervention. We also plan to examine the changes in total cost to Medicare associated with telemedicine use among the fee-for-service Medicare beneficiaries.

abs-os497 The Patient Will Text You Now: Telemedicine and In-person Hospital Visits in China

PRESENTER: **Xuening Cheng**
AUTHORS: Xuyan Lou, Qing-Ping Ma, Yan Cen, Xuyang Wang, Mr. Wei Jiang, Lina Song, Mr. Zhuo Chen, Hongqiao Fu, Alain Chong

Background: Telemedicine restructures the health delivery system by allowing remote access to high-quality services and increasing the labour supply of public hospital doctors. It is believed that telemedicine is an extension of traditional hospital-centred healthcare. The COVID-19 pandemic has highlighted the importance of telemedicine. However, there is limited evidence for the substitution effect of telemedicine on traditional healthcare through the common supply factor in both online and offline health services – the doctor, in particular, during the COVID-19 pandemic. Little research has examined the effectiveness of telemedicine services on in-person healthcare utilization in Low-and-Middle-Income-Countries (LMICs) because of data limitations. **Methods:** This paper uses two unique data sets – online service data and hospital visits data, to identify the impact of telemedicine utilization on hospital visits in China, a middle-income country. Online service data, scraped online, contain extensive information on active doctors providing online health services through commercial third-party platforms. Hospital visits data has utilized aggregated population flow to hospitals at the city level, generated from mobile-phone signalling data from one of China's major mobile phone service providers. The two-way fixed effect (TWFE) model and generalized linear model (GLM) regressions are used to conduct the baseline analysis. Simultaneous equations model (SEM) and instrumental variable (IV) methods are used to explore the bidirectional relationship between hospital service and telemedicine utilization. **Findings:** We found that a 1 percentage decrease in outpatient visits is associated with 0.005 percentage increase in online consultation, and 1 percentage decrease in inpatient visits is associated with 0.018 percentage increase in online consultation. However, these effects showed a strong trend over time that partly driven by the pandemic. SEM model reported that 1% decrease in outpatient visits associates with 0.18% increase in online consultation, and no significant effect in hospital inpatient visits. Meanwhile, 1% increase in online telemedicine consultation associates with over 0.7% increase in hospital visits for both outpatient and inpatient visits. **Interpretation:** Our study examines the interactive role between hospital healthcare and telemedicine service from provider side, especially the hospital who takes the most important role in a LMIC setting. The substitution effects between hospital healthcare and telemedicine service are verified through our analysis. The decrease in the number of hospital visits is associated with more online consultations, which implies the lower transaction cost for online services for patients. On the flip side, the increase in hospital workload could reduce physician's provision of online services in the same period. Study results provide empirical evidence on the effectiveness of telemedicine services and policy implications for the new healthcare paradigms for China and other LMICs.

3:30 PM –5:00 PM MONDAY [Evaluation Of Policy, Programs And Health System Performance]

os236 Bali International Convention Centre – Hibiscus

Improving the Efficiency of Healthcare Provision

MODERATOR: **Partha Deb**, Hunter College

CONVENER: **Anirban Basu**, The CHOICE Institute, University of Washington, Seattle

DISCUSSANT: **Jason Brian Gibbons**, Mass General Brigham; **Ana Balsa**, University of Montevideo

abs-os690 Busyness in the Maternity Ward and Quality of Care

PRESENTER: **Dan Han**
AUTHORS: Margaret McConnell, Emma Clarke-Deelder

Excessive provider workload can affect health care procedures in ways that undermine patient outcomes, but evidence on the workload-quality relationship in low- and middle-income countries (LMIC) is sparse. Existing research predominantly focuses on primary care settings or major staffing shocks, leaving open questions about the effects of everyday workload variations in tertiary care settings.

In this study, we use data collected through direct observation of vaginal deliveries in three large Kenyan hospitals to explore how providers cope with busyness in the maternity ward. The maternity ward is a unique and important setting for studying the impacts of provider workload. First, hard-to-schedule patient admissions and uncertainty around labor progression could result in crowding at various times during the day, creating somewhat unpredictable workloads for identification. Second, teamwork is an essential feature of labor and delivery care, and how providers respond to workloads in a team-based environment may differ from that in a primary care setting.

We begin by documenting variation in provider workload (measured as patient volume relative to nurse-midwife staffing) by the time of day and show that our identifying variation is quasi-random. Our quality measures capture provider adherence to guidelines during routine labor & delivery and immediate maternal and newborn care, practice of disrespectful care, and patient outcomes. We find that the relationship between provider workload and quality is much weaker than expected. To explain the lack of a meaningful workload-quality association in this setting, we examine how providers cope with increased workload. We show that when busier, providers increasingly delegate tasks to less qualified team members and use clinical interventions to speed up labor. We also find suggestive evidence that providers may discharge patients earlier

than clinically appropriate in anticipation of limited staffing levels. Our findings have important policy implications in light of LMIC's efforts to shift deliveries to hospitals.

abs-os691 Cost Dynamics of Noncommunicable Diseases in a National Health Insurance Context: Empirical Evidence From Ghana

PRESENTER: **Stéphane Verguet**, Harvard University
AUTHORS: Dr Richmond Ensiwoyie, Kathrin Durizzo

Objective Noncommunicable Diseases (NCDs) are a growing health burden in developing countries, driven by demographic shifts and rapid socio-economic development, accounting for approximately 50% of deaths across most sub-Saharan African (SSA) countries. Besides their burden on health and mortality, NCDs impose significant financial burdens, escalating out-of-pocket health expenditures. To avoid an escalation of out-of-pocket expenditures many health insurance schemes in SSA cover NCDs. In Ghana, a country with one of the most advanced health insurance schemes in SSA, the National Health Insurance Scheme covers a broad range of NCDs, including stroke, hypertension, diabetes, and certain cancers, since its inception in 2003. In addition, Ghana adopted the World Health Organization Package of Essential Noncommunicable Disease Interventions (WHO PEN) in 2022 to enhance healthcare providers' capabilities to detect and manage NCDs. As NCD rates rise and many SSA countries strive to establish sustainable national health insurance schemes, understanding usage patterns and cost drivers within large-scale, mandatory insurance schemes is increasingly critical. Despite the importance, evidence on this topic remains sparse. Furthermore, little is known about the impact of NCD programs, such as the WHO PEN, on usage patterns and costs.

Method This study analyzes novel claims data from the Ghanaian NHIS over a ten-year period (2014-2023) to examine insurance utilization patterns and cost drivers associated with NCDs (i.e., stroke, hypertension, diabetes, cervical, breast, and childhood cancers). We can separately identify the costs for medicine and services per claim to more accurately compute cost drivers. The geographical variations in the implementation of WHO PEN policies allow for a quasi-experimental analysis of the policy's effects on usage patterns. Therefore, we can provide the first causal evidence on the program in Ghana.

Results We found a significant increase in NHIS claims for NCDs, from 0.66 million claims in 2013 to 1.4 million in 2023, with total NCD costs escalating from 24 million GHS in 2013 to 300 million GHS in 2023 (1 GHS = 0.06 USD). The cost per claim rose from 35 GHS in 2013 to 214 GHS in 2023. Diabetes and hypertension account for 70% of all NCD claims, while cancer treatments have the highest average costs. Notably, the average age of patients receiving NCD treatments has decreased, and referrals to higher level facilities are functioning as intended. The implementation of the 2022 NCD intervention policies significantly altered usage patterns, with a nearly 50% reduction in cost escalation observed in regions where the new policies were implemented. These effects were similar across costs associated with both services and medication.

Discussion Our findings underscore the significant financial protection of patients being covered by NHIS. It also highlights the potential for NCDs to place a substantial, unsustainable strain on NHIS financing if current trends continue. However, the evidence suggests that the recently implemented NCD policies can mitigate this cost burden. Scaling and extending these policies nationwide could reduce future cost escalations, thereby supporting more sustainable health financing.

abs-os692 Physician Deterrence From Fraud, Waste, and Abuse

PRESENTER: **Eunhae Shin**
AUTHOR: Alice Chen

Fraud, waste, and abuse in the United States are estimated to account for $760 billion to $935 billion annually, representing approximately 25% of total healthcare spending. The Federal Bureau of Investigations estimated that health care fraud alone cost American taxpayers nearly $80 billion per year. Of this amount, the US Department of Justice recovered only $2.2 billion in 2020. Though seemingly small, this recovery highlights the potential value of policy initiatives such as the Affordable Care Act and Small Business Jobs Act—to identify and exclude fraudulent providers from participating in Medicare and Medicaid programs. In particular, the ability of these policies to deter potentially fraudulent activities before they occur can yield significant additional savings. We lack a comprehensive understanding of how such sanctions affect the behavior of potentially fraudulent providers.

In this paper, we examine changes in physician behavior when their peers receive direct sanctions from the US Department of Health and Human Services' Office of Inspector General (OIG). Specifically, we examine changes in billing patterns (e.g., total claims and charges, prices per service, and the use of low-value care) and physician organization sorting when a physician peer has been excluded from participating in the Medicare and Medicaid programs.

Our analysis relies on three datasets. First, we identify information on physician exclusions from the OIG's List of Excluded Individuals/Entities (LEIE). The LEIE data includes all excluded physicians and their dates of exclusion. We supplement this data with text searches from the Department of Justice to identify dates of indictment. Finally, we use 20% administrative Medicare claims data from 2002 to 2014 to identify physicians, their organization, and their services provided.

We focus on peer-responses within an organization, so our sample universe consists of physicians within organizations that have experienced an exclusion. Using a multivariate logit model, we predict which physicians are likely to be fraudulent. Then, we use event study and matched difference-in-difference approaches to analyze changes in physician billing and organization alignment among potentially fraudulent providers.

We find that Medicare exclusions have a significant deterrence effect on potentially fraudulent providers. Responses begin at the time of peer indictment and continue through the date of peer exclusion. Claims and charges fall and are driven by declines in both claims and charges per patient and the number per patient seen. We also find evidence that charges per service falls, suggesting that potentially fraudulent physicians

are reducing billing for specifically more expensive procedures. Deterrence effects are highest in larger organizations, among hospital-based specialties, and they highlight additional savings from the prosecution of fraud and abuse cases.

Our results demonstrate that Medicare exclusions create a significant deterrence effect among providers who consistently over-bill for care. In addition to removing fraudulent providers, efforts to combat fraud, waste, and abuse generate large spillover effects, discouraging other potentially fraudulent providers who are yet to be sanctioned. Notably, these physicians are those for which detection is potentially more difficult and costly.

3:30 PM –5:00 PM MONDAY [Economic Evaluation Of Health And Related Care Interventions]

os49 Bali International Convention Centre – Orchid

HTA Review in the Asia-Pacific: Reflections and learnings

MODERATOR: **Trudy Sullivan**, University of Otago | ?t?kou Whakaihu Waka

CONVENER: **Paula Lorgelly**, University of Auckland

abs-os701 Advancing HTA in Thailand through Reflection, Learning, and Adaptability: The Path to Universal Health Coverage

PRESENTER: **Ms. Wanrudee Isaranuwatchai**, Health Intervention and Technology Assessment Program (HITAP), Ministry of Public Health, Nonthaburi, Thailand.
AUTHOR: Yot Teerawattananon

Thailand launched its Universal Health Coverage (UHC) Scheme in 2001, which provided a baseline level of healthcare for children, older people, and those of working age. This system has been extended in intervening years, removing copayments and providing coverage to non-Thai citizens and stateless people in 2024.

Health technology assessment (HTA) is one tool which has been used to support UHC by generating economic evidence such as cost-effectiveness and budget impact analysis, along with other types of evidence like a feasibility plan and processes for monitoring and evaluation. As countries pursue UHC, it is important to make both informed and fair choices, such that efforts to improve efficiency and financial sustainability are balanced with the need to address inequities. Healthcare payers around the world are progressively using economic evidence to inform decision-making (such as whether to include a medicine or a new medical device in a benefit package) to achieve UHC.

In Thailand, the use of HTA started around 2007 but, as with other changes globally, HTA processes and methods require adaptation in order to remain relevant and to be able to support the policy-making process and ultimately the achievement and sustainability of UHC. This has required that Thailand explore a variety of purchasing models for medicines.

This case study focuses on the role of HTA in Thailand as a means to support UHC. The presentation will highlight the impact of HTA in Thailand by sharing lessons learned including real-world examples of how HTA has been used to support policy-making processes, such as the inclusion of health interventions in the universal coverage benefit package and medications for the National List of Essential Medicines. In addition, examples will be shared on ways HTA processes and guidelines have been adapted or need to be adapted to address ongoing and emerging challenges. Feedback from the session's attendees would be beneficial as we continue to apply HTA to the real-world setting and find ways to optimize its use to support UHC.

abs-os40 From the Pharmac Review to a Letter of Expectations: The Changing Face of HTA in Aotearoa New Zealand

PRESENTER: **Paula Lorgelly**, University of Auckland
AUTHOR: Richard Edlin

Aotearoa New Zealand's Pharmaceutical Management Agency (Pharmac) was established in 1993. Pharmac's first guidelines, the Prescription for Pharmacoeconomic Analysis (PFPA), was published in 1999, updated significantly in 2007 and again with minor changes in 2012 and 2015. Pharmac is unique as a health technology assessment (HTA) agency as it is both the decision-maker and the funder of medicines. Their statutory objective is to secure the best health outcomes for eligible people in need of pharmaceuticals, within the amount of funding provided. As Pharmac has a limited budget it manages a priority list of medicines and technologies (the Options for Investment list) that it would like to fund if it could afford it. Technologies are ranked and funded in priority order when more budget is received, or cost savings are achieved elsewhere within the portfolio they manage. As the order of this list is not made public, neither the public nor companies know how close a listed technology is to being funded. Pharmaceuticals are on the Options for Investment list for an average of 5.9 years; for this reason, there is considerable criticism of Pharmac.

In 2021 Pharmac was the subject of an independent review, the panel reported in 2022 making 33 recommendations. Many of these recommendations focused on the inequity of Pharmac's decision making, both processes and the consequences. With respect to the methods employed to assess value for money, a recommendation was that Pharmac should develop an integrated analytical framework for the assessment of pharmaceuticals that incorporates enhanced cost-benefit analysis with strengthened distributional elements and strengthened equity analysis in all its decision-making processes.

Aotearoa New Zealand had a general election in 2023. Health featured significantly in the electoral manifestos of most parties, ranging from promises of ring-fenced funding for cancer drugs to replacing Pharmac with a new patient-focussed medicines buying agency. The National-led coalition government has created a new ministerial portfolio specifically for Pharmac, and most recently Pharmac received its instructions (or expectations) regarding how it is expected to perform (indeed reform). This includes a focus on fiscal or social impact, i.e. taking a societal perspective, and greater involvement of patients in the decision making process.

This case study will reflect on these varying approaches to review and change; that directed by an independent review and that directed by a Minister, including undertaking comparisons with other reviews or methods changes internationally. We will discuss the role of health economists in these processes and their contributions to methods improvement.

abs-os700 The Australian HTA Review: Reflections from an Expert Group

PRESENTER: **Joseph Thomas**, University of Technology Sydney
AUTHORS: Rosalie Viney, Stephen Goodall, Kathleen Manipis, Rosalie Viney, Richard De Abreu Lourenco

Since 1992 Australia has been a pioneer in health technology assessment (HTA), requiring evidence of cost-effectiveness when evaluating the reimbursement of pharmaceuticals. In the following years it expanded the requirement of this evidence to procedures, diagnostic tests, and devices. There are two main committees that assess HTA evidence: the Pharmaceutical Benefits Advisory Committee (PBAC) and the Medical Services Advisory Committee (MSAC).

Australia has just undertaken its largest and most comprehensive review of HTA policies and methods to date. Initiated as part of a strategic agreement between the Australian Government and Medicines Australia, the peak representative body of the innovator pharmaceutical industry in Australia, the HTA Policy and Methods Review focused on enhancing access to funded health care technologies, balanced against achieving an equitable and affordable healthcare system.

The Review was led by a Reference Committee comprising representatives from Government, Industry, HTA Agencies and Consumer representatives. The HTA Review Reference Committee made 50 recommendations in its final report. Those recommendations were informed by independent research conducted by external expert groups, public consultation and extensive deliberation by the Committee. The independent research captured not only local experience, but importantly, compared HTA systems and processes in Australia relative to other countries, including stakeholder feedback and proposed changes.

This case study will present the experiences and reflections of one of the external expert groups informing the Review, with a focus on exploring their role in the Review, its overall conduct and reflections on HTA reform globally.

3:30 PM –5:00 PM MONDAY [Health, Its Valuation, Distribution And Economic Consequences]

os83 Bali International Convention Centre – Frangipani

Strengthening Evidence on Health Inequality Aversion: International Perspectives and Methodological Innovations

MODERATOR: **Marie-Anne Boujaoude**, The University of Melbourne

DISCUSSANT: **Shehzad Ali**, Western University

abs-os156 Exploring Health Inequality Aversion Among Thai Policymakers and General Public Through Health Inequality Aversion Survey

PRESENTER: **Picharee Karunayawong**
AUTHORS: Ms. Wanrudee Isaranuwatchai, Chittawan Poonsiri, Richard Cookson, Manta Korakot, Chulathip Boonma, Sarin KC

Introduction and objective: Cost-effectiveness analysis (CEA) has been used as one of the criteria for including medicines, vaccines, or other health technologies in healthcare systems worldwide, including in Thailand. This use of economic evidence aims to promote efficiency in decision-making process in the Thai health system. However, traditional CEA has limitations, as it does not incorporate health inequity, which is a significant concern in many countries. Distributional Cost-Effectiveness Analysis (DCEA) is one of the alternative methods which can integrate equity considerations into economic evaluations, helping to address this gap. To conduct a DCEA, an estimate of equity index is required. This study aims to reports the results of health inequality aversion survey in Thailand which will be used to support the first DCEA study in Thailand.

Methods: A health inequality aversion survey was conducted in both online and in-person format. The survey was divided into 2 parts: 1) background information of participants; and 2) questions about the trade-off between reducing health inequity and improving health efficiency. To quantify people's value of health equity, participants would be categorized into one of the five groups: 1) pro-rich (prefer to improve health gains for the rich); 2) health maximiser (prefer to improve total health only); 3) weighted prioritarian (prefer to give greater weight to improve the health of the worst-off); 4) maximin (prefer to improve the health of the worst-off) and 5) egalitarian (prefer to reduce health inequality so much that they are willing to sacrifice potential health benefits to the worst-off).

The survey was translated and piloted among stakeholders, including policymakers, researchers, health coverage schemes representatives, and patient representatives. Pre-survey training among the interviewers and checking questions (for both content and figures) were conducted to maximize the accuracy of the responses.

The survey was conducted among Thai policymakers from National List of Essential Medicines (NLEM) and Universal Coverage Benefit Packages (UCBP) during the online subcommittee meeting. The research team introduced the overview of the survey, after which policymakers independently responded to the questions via an online survey platform. Two approaches were used for general public to explore the inequality aversion of Thai population, including in-person and online survey. Data collection took place in December 2023 for policymakers, from January to February 2024 for in-person general public responses, and from February to March 2024 for online general public responses.

Results: There were 28 responses from policymakers survey, 2,584 responses from in-person general public, and 438 online general public. The valid response rates were 43%, 96%, and 37% respectively. The result from policymakers and the online general public were categorized as weighted prioritarian, while the in-person general public was categorized as egalitarian.

Conclusion: These findings highlight the importance that Thai people place on addressing health inequality, representing the first measurable impact for policymakers to actively consider health equity in their decision-making processes. They also highlight the differences in responses between policymakers and general public, and also between online and in-person format. Results from this survey will be used in conducting Thailand's first DCEA study.

abs-os154 Income-Related Health Inequality Aversion and Its Geographical Variations: Evidence From China

PRESENTER: **Shan Jiang**
AUTHORS: Dandan Yu, haiyin Wang, Yuanyuan Gu

Background: In evaluating health interventions, the public is concerned not only with the overall health improvements (efficiency) but also with how these benefits are distributed across different population groups (equity). This balance is captured by health-related social welfare functions (SWF) in distributional cost-effectiveness analysis (DCEA). However, DCEA has yet to be widely adopted by governments in many countries, including China, due to a lack of reliable estimates for the key parameter, health inequality aversion.

Aims: To understand how much the public is willing to sacrifice overall health improvement to reduce health inequality, this study estimates the inequality aversion parameter using a stated preference approach with a sample of the general public in China. It also quantifies variation in health inequality aversion across different regions to enhance the accuracy and applicability of DCEA.

Methods: Face-to-face, one-on-one surveys were conducted across seven geographically diverse cities in China. Quota sampling was used to ensure representativeness across gender, age, and residence. The sample was reweighted using entropy balancing to align with national demographics. Respondents made seven pairwise choices between two hypothetical options: Option A provided seven additional years of life to the richest quintile (life expectancy 81 to 88) and three years to the poorest quintile (life expectancy 73 to 76); Option B provided three years to the richest quintile (life expectancy 81 to 84) and a varying number of years to the poorest quintile (life expectancy 73 to 75-81). Across the seven questions, Option A remained the same, while Option B progressively reduced the life expectancy gains for the poorest quintile from eight to two years. The switching point from B to A revealed the level of health inequality aversion, which was quantified using Atkinson SWF parameters. Ordered probit models were used to explore geographical variations and the effects of individual characteristics.

Results: The survey (October 1, 2023 - February 9, 2024) received 1,327 valid responses out of 1,649 participants. 92.4% of respondents were willing to sacrifice some total health gains to reduce health inequality. The median Atkinson inequality aversion parameter was 17.5, implying that health gains to the poorest quintile were weighted 6.2 times as highly as those to the richest quintile by the Chinese public. Rural residents expressed a stronger aversion to health inequality than urban residents. Compared to residents in Shanghai, whose aversion levels were similar to those of the UK public, residents in some less developed cities showed a greater emphasis on reducing health inequality, even after controlling for household income.

Conclusions: The Chinese public exhibits strong health inequality aversion, with substantial geographical heterogeneity. The estimated inequality aversion parameters can be used in DCEA to inform decisions on healthcare resource allocation. These findings suggest that, in large, populous countries, applying a single parameter for national preferences may misrepresent the distributional effects of health interventions. Instead, the distributional impact should be measured regionally before aggregating the results nationwide. The elicited parameters offer insights into public preferences and also contribute to the methodological improvement of DCEA. Income-Related Health Inequality Aversion and Its Geographical Variations: Evidence From China

abs-os155 Responsibility-Sensitive Welfare Weights for Health

PRESENTER: **Matthew Robson**
AUTHORS: Tom Van Ourti, Owen O'donnell

We estimate responsibility-sensitive welfare weights for health that facilitate inequality- and inequity-sensitive policy evaluation. In a UK general population sample, 569 online experiment participants distribute constrained resources to determine the health of hypothetical individuals distinguished by randomly generated resource productivity as well as sex, income and smoking (41,460 observations). We elicit beliefs about responsibility for income and smoking, and use their associations with the allocations to estimate responsibility-sensitive weights that reflect inequality aversion and health prioritisation by the non-health characteristics. There is slight, moderate and substantial prioritisation of females, the poor and non-smokers, respectively. Inequality aversion lowers weights on females and non-smokers, who are health-advantaged, and raises the weight on the poor, who are health-disadvantaged. As beliefs about responsibility for income and smoking

strengthen, weights on the poor decrease and weights on non-smokers significantly increase. Responsibility-Sensitive Welfare Weights for Health

abs-os157 Whose Voices are Lost? Identifying Characteristics of Excluded Groups in Health Inequality Aversion Studies

PRESENTER: **Ms. Marie-Anne Boujaoude**
AUTHORS: Natalie Carvalho, Kim Dalziel, Nancy Devlin, Sitanshu Sekhar Kar

Background and objectives: Stated preferences exercises, such as benefit trade-off (BTO) surveys, are increasingly used to elicit health inequality aversion parameters. However, the complexity of the exercise, combined with the necessity for rational and consistent responses, often results in the exclusion of respondents who fail to meet certain quality standards. This practice risks discarding the views of subgroups (such as poor literacy), potentially introducing bias and limiting the findings representativeness. Additionally, differences in the mode of survey administration (i.e. in-person vs online) may further influence the type of respondents who complete or are excluded from the survey. Understanding the characteristics of excluded respondents and examining the variations between in-person and online responses can shed light on which groups may face challenges with the task requirements and inform strategies to enhance inclusivity in health preference research.

Research questions:

1. How do the demographic and socioeconomic characteristics of (a) excluded respondents compare with those included in the final analysis, and (b) those with valid responses compare to those with invalid responses among survey completers?
2. How does the characteristics of in-person and online survey respondents compare with the setting specific background population?

Methods: A BTO survey was conducted online with a sample from the Australian public to elicit preferences related to health inequality aversion. Throughout the survey, quality control questions were introduced to ensure respondents were graph literate, understood and engaged with the task. Respondents were excluded at various stages if their responses indicated irrational decision-making or if they failed to answer minimum quality control questions correctly. Another BTO survey was conducted in person in India to elicit health inequality aversion preferences. The number of valid responses and characteristics of the discarded respondents were compared. Logistic regressions were run to predict the likelihood of a respondent being excluded based on demographic and socioeconomic factors for the Australian sample.

Results: Respondents were excluded at several points: those excluded for incorrect graph reading and for not correctly selecting the dominant response to a trade-off question were significantly less educated, older, and from lower income quintiles. Remoteness and gender didn't seem to impact exclusion. Of the respondents who completed the survey, 22% were excluded for giving invalid answers. The characteristics of the respondents did not vary significantly between these 2 groups. The likelihood of being discarded due to any exclusion criteria is 31% higher if the respondent is between 18 and 34 years old. Respondents in the highest income quintile had 48% lower odds of being excluded compared to those in the lowest income quintile. The face-to-face BTO didn't have to discard any response, as they were all valid. Additional analysis will compare the *online versus in-person* sample characteristics to the setting specific *background population*.

Conclusion: The findings suggest that such stated preference exercises may inadvertently exclude certain respondent voices. These patterns emphasize the need for simplified survey designs or additional support mechanisms to improve inclusivity and ensure a more representative sample in studies aiming at eliciting health inequality aversion parameters, without including additional biases.

3:30 PM –5:00 PM MONDAY [Evaluation Of Policy, Programs And Health System Performance]

os87 Bali International Convention Centre – Denpasar B

The Economics of Dental Care: Shaping Evidence-Informed Policy

MODERATOR: **Abdulrahman Ghoneim**, Dalhousie University

CONVENER: **Ziade Sarroukh**, Department of Dentistry, Radboud University Medical Center

abs-os105 A Costing Analysis of a Comprehensive Dental Care Program

PRESENTER: **Mr. Abdulrahman Ghoneim**
AUTHORS: Rebecca Hancock-Howard, Sonica Singhal, Audrey Laporte, Carlos Quiñonez

Background: Understanding the costs of implementing a comprehensive dental care program is paramount for informing policy decisions. This study aimed to estimate the direct and indirect costs associated with delivering a comprehensive dental care program for those who experience cost-barriers to care.

Methods: This costing analysis leverages data from a single-group repeated-measures study to assess the impact of receiving free dental care. Participants who met the eligibility criteria received comprehensive dental care and were followed up after attaining 'oral health stability.' Using a micro-costing method, we estimated the direct and indirect costs of delivering this program. The direct costs of 1) treatments rendered and 2) medications prescribed as part of the treatment plan were included. Indirect costs captured were 1) travel expenses, 2) productivity losses, and 3) caregiving expenses.

Results: Data from 134 participants who completed one year of follow-up were analyzed. After one year of implementation, the average direct

and indirect costs were CAD $2,699 (SD: 1,610) and CAD $696 (SD: 605), respectively. When extrapolating our findings to the adult beneficiaries of the Canadian Dental Care Plan (CDCP), the total direct cost of the first year of implementation amounts to $19.70 billion.

Discussion: This is the first study to utilize participant-level data to estimate the cost of implementing a free comprehensive dental program. This study addresses the methodological limitations of previous studies in this field.

Conclusion: The findings from this study will inform policy decisions regarding implementing future dental care programs.

abs-os106 How to Ensure an Appropriate Oral Health Workforce? Modelling Future Scenarios for the Netherlands

PRESENTER: **Jip Janssen**
AUTHORS: Ave Pöld, Md Monirul Islam, Orsolya Németh, Jostein Grytten, Noel Woods, Stefan Listl

Background: Current methods for oral health workforce planning lack responsiveness to dynamic needs, hampering efficiency, equity and sustainability. Effective workforce planning is vital for resilient health care systems and achieving universal health coverage. Given this context, the aim of this study was to develop and operationalise a needs-adaptive oral health workforce planning model and explore the potential of various future scenarios.

Methods: Using publicly available data, including the Special Eurobarometer 330 Oral Health Survey, we applied the model in a hypothetical context focusing on the Dutch population's dental needs from 2022 to 2050. We compared current and future provider supply and requirement and examined, in addition to a base case scenario, several alternative scenarios. These included epidemiological transition scenarios with different oral health morbidity trajectories, skill-mix scenarios with independent oral hygienists conducting check-ups and multiple dental student intake and training duration (5 instead of 6 years) scenarios. The model also assessed the impact of different recall intervals for dental check-ups (6-month vs. 12-month or 24-month intervals) to explore potential reductions in overall provider requirement.

Results: Based on the aforementioned historical data, our model projects that provider requirement will exceed supply for the planning period. If the percentage of people having all natural teeth increases by 10% or 20% in 2032, 34 or 68 additional full-time equivalent (FTE) dentists will be required, respectively, compared to the base case scenario. In the skill-mix scenario, the model indicates that prioritising oral hygienists for check-ups and shifting dentists' focus to primarily complex care could address population needs more efficiently: FTE provider requirement was projected to be 229 lower than the base case scenario. Additionally, further substantial requirement reductions could be achieved if skill-mix implementation results in shorter check-up times. Among the student intake and training duration scenarios, increasing intake to 375 and reducing training to 5 years is projected to most effectively close the provider gap. However, shortening training duration has a more limited impact, as its benefits only take effect once.

Conclusions: The study underscores the importance of understanding oral health morbidity trajectories for effective capacity planning. Due to limited dental epidemiological data, projections carry substantial uncertainty. Currently, demand for FTE dentists seems to exceed supply, though this may vary with epidemiological changes. Skill-mix strategies could offer efficiency gains by redistributing tasks, while adjustments in dental intake and training duration could also help address the requirement-supply gap. Additionally, reducing administrative burdens on dental professionals, such as time spent on non-patient-related activities, and extending check-up recall intervals could further improve efficiency in care delivery (with no expected oral health impact). Resolving dentistry workforce challenges requires a multifaceted approach, including strengthening oral epidemiology projections, addressing the root causes of dental health issues and prioritising harmonious dental public health and general practice prevention measures.

abs-os107 Looking Back and Moving Forward: Towards Evidence-Informed Priority Setting and Resource Allocation in Oral Health Care Systems

PRESENTER: **Ziade Sarroukh**
AUTHORS: Patrick Jeurissen, Rob Baltussen, Shaila Akter, Jip Janssen, Stefan Listl

Background: As almost half the global population continues to suffer from oral diseases and the costs of dental care exacerbate catastrophic expenditures, oral health care has increasingly drawn the attention of the global policymaking agenda seeking universal access in health care. However, a lack of coherence between challenges and policymaking endeavors has resulted in seemingly untransparent priority setting and resource allocation in oral health care systems. This research aims to identify the determinants of prioritization in European oral health policymaking and implement a multicriteria-decision analysis (MCDA) as part of a deliberative process of evidence-informed resource allocation.

Methods: Drawing from situational analysis and MCDA methods, a stepwise approach was used. A literature review on oral health policy programs in Denmark, Germany, the Netherlands and the United Kingdom and key informant interviews with policymakers were conducted to identify determinants of priority setting. Findings were translated into methodological considerations of the MCDA used to prioritize dental services for adults in the Netherlands. Services and decision criteria were defined through a Nominal Group Technique (NGT) with an advisory panel consisting of policymakers, patients, dentists, health economists and representatives from a health insurance company. Weights of criteria were elicited using swing weighting questionnaires answered by panel members. The scoring of alternative interventions against the consented criteria serves as basis for ranking the interventions by the advisory panel.

Results: 249 articles were included, and six key informants were interviewed. Three stages were identified which characterize the complexity in oral health policymaking: 1) political accountability to address population demand, 2) stakeholder influence through negotiations and lobbying, and 3) bureaucratic justification of policy innovations. While the findings highlighted political attention on oral health care through public outcry, complex negotiations and limited data formed bottlenecks for prioritization of concrete solutions. An MCDA advisory panel was formed which includes 11 stakeholders with diverse backgrounds. Key decision criteria comprise disease burden, health gain, costs, prevention,

safety and esthetic effects. These criteria are sensible to rank interventions for periodontal disease, caries, tooth wear and masticatory disorders.

Conclusion: Current prioritization in oral health policies seem to be dominated by fragmented investments in incremental services of delivery rather than fundamental reforms such as granular package designs. Complex negotiations, strained by interests of private professionals and challenges of limited evidence, result in difficulties to constrain oral health policies within public spending targets. This has placed oral health care systems in a state of inertia, where insufficient public resources meet the force of content exerted by the private sector. Aligning stakeholders through evidence-informed deliberation could strengthen prioritization and relieve these bottlenecks. Our research is among the first MCDAs to prioritize dental services while facilitating a deliberative process between stakeholder groups. Findings from the MCDA will reveal a ranking of essential services and demonstrate the feasibility of implementing a deliberative prioritization of dental resources.

abs-os103 Oral Health Care Out-of-Pocket Costs and Financial Hardship: A Scoping Review

PRESENTER: **Diego Proaño**
AUTHORS: Abdulrahman Ghoneim, Beverley Essue, Sonica Singhal, Carlos Quiñonez, Hellen Huang, Sara Allin

Objective: The objective of this study is to characterize how financial hardship related to oral health care (OHC) out-of-pocket (OOP) spending has been conceptualized, defined, and measured in the literature and to identify evidence gaps in this area.

Methods: This scoping review follows Arksey and O'Malley's framework and synthesizes financial hardship from OHC concepts, methodologies, and evidence gaps. We searched Ovid-Medline, Ovid-Embase, PubMed, Web of Science, Scopus, EconLit, Business Source Premier, and the Cochrane Library. Gray literature was sourced from institutional websites (World Health Organization, United Nations, World Bank Group, Organisation for Economic Co-operation and Development, and governmental health agencies) as well as ProQuest Dissertations and Thesis Global. We used defined inclusion and exclusion criteria to select studies published between 2000 and 2023.

Results/Discussion: Of the 1,876 records, 65 met our criteria. The studies conceptualized financial hardship as catastrophic spending, impoverishment, negative coping strategies, bankruptcy, financial burden, food insecurity, and personal financial hardship experience. We found heterogeneity in defining OHC OOP payments and services. Also, financial hardship was frequently measured as catastrophic health expenditure using cross-sectional designs and national household spending surveys from high-income and to a lesser extent lower-middle-income countries. We identify and discuss challenges in terms of conceptualizing financial hardship, study designs, and measurement instruments in the OHC context. Some of the common evidence gaps identified include studying the causal relationship in financial hardship from OHC, assessing the financial hardship and unmet dental needs due to cost relationship, and distinguishing the effect between pain/discomfort and esthetic/cosmetic dental treatments on financial hardship.

Conclusion: Financial hardship in OHC needs further exploration and the use of consistent definitions as well must distinguish between treatments alleviating pain/discomfort from esthetic/cosmetic treatments. Our study is relevant for policy makers and researchers aiming to monitor financial protection of OOP payments on OHC in the wake of universal health coverage for oral health.

3:30 PM –5:00 PM MONDAY [Evaluation Of Policy, Programs And Health System Performance]

os98 Bali International Convention Centre – Bandung

Policy Effects on Mental Health

MODERATOR: **David Johnston**, Monash University

CONVENER: **Joe Spearing**, University of York

abs-os123 Are You Okay? Effects of a National Peer-Support Campaign on Mental Health

PRESENTER: **Nicole Black**, Monash University
AUTHORS: Johannes Kunz, Lachlan Deer, David Johnston

Background: Suicide is the leading cause of death among young adults (15-44 years) and about one in five Australians experience mental illness in a given year, yet many do not receive the treatment or support they need. Social and peer support is recognised as being protective against mental illness and suicide. National public health awareness campaigns that emphasize peer-to-peer support are being increasingly adopted by governments and NGOs, but evidence on the effect of peer-based support programs at scale is limited **Objectives**: Using quasi-experimental methods, we examine whether a prominent, nationwide peer-based support campaign, "R U OK? Day", that addresses awareness of mental health and suicide prevention affects short-term mental health outcomes in Australia. **Methods**: Using variation in daily records before and after R U OK? Day, and differences in the campaign's intensity over nine years (2011-2019), we examine the impact of the R U OK? Day campaign on perceived social support and mental health using household survey data (with quasi-random interview dates). We also examine the impact of the campaign on mental healthcare use and suicides using national administrative health insurance and death records. **Results**: We found a significant increase in Google and Twitter searches for "R U OK" in response to the campaign verifying increasing intensity of the campaign over time. Estimates from the difference in differences analyses suggests that R U OK? Day led to a small improvement in perceived social support and mental well-being, particularly among young males aged 25-49 years in the four weeks following the campaign. However, we found no evidence that R U OK? Day had any effect on the uptake of mental healthcare use or suicides over this same period. **Conclusion**: This is the first study to measure the effect of a peer-to-peer mental health campaign on the mental health of the general population by observing variation in a range of daily records and survey data before and after the campaign. Although we found no evidence of an impact on suicide or deaths of despair, the R U OK? Day campaign led to small improvements in mental wellbeing, especially

among young males. Young males are an important target group given the high rates of suicide and low utilisation of needed mental health services in this population.

abs-os124 Talking Through Our Mental Health Problems. The Impact of Talk Therapy on Healthcare Utilization and Employment

PRESENTER: **Roger Prudon**

Background: According to the OECD, half of all people will suffer from mental health issues at some point in their lives. These mental health issues often have large negative impacts on individuals' lives. While treatment could be effective in mitigating these negative impacts, treatment uptake rates are limited, resulting in many people with mental health issues not receiving (adequate) care. Increasing treatment uptake could therefore have substantial positive benefits to society.

To increase treatment uptake, governments around the world have introduced large-scale programs aimed at provided easily accessible form of mental healthcare. Examples of these programs are the NHS Talking Therapies Program in the UK, the Better Access Initiative in Australia and Project Teach in New York. Evidence on the effectiveness of these programs is however scarse.

Objectives: This paper evaluates the introduction of a similar program that provided an easily accessible form of talk therapy in the Netherlands. This talk therapy, provided by mental healthcare practice assistants (MH-PA) at general practitioner (GP) offices, was introduced in 2012 to alleviate pressure from the specialised mental healthcare system and increase treatment uptake rates. As a first step, I examine how the introduction affected the uptake of talk therapy itself and the treatment provided by the already existing specialised mental healthcare system. In the second step, I examine the impacts of the increased treatment uptake on a range of labour market outcomes.

Methods: Using administrative data, I first exploit the quasi-random timing at which the talk therapy was introduced in GP offices nationwide using a Regression-Discontinuity-in-Time framework. Additionally, I exploit variation in the propensity to refer to talk therapy in a Judge IV setting.

Results: The introduction of talk therapy at GP offices significantly increased treatment uptake. For most individuals, talk therapy is complementary to the already-existing treatment option as these individuals would not have received care before the introduction of the NPMH. The new form of treatment is however mostly used by subpopulations with a relatively high pre-introduction utilization of mental healthcare, potentially increasing existing disparities in care utilization. Additionally, following the increased treatment uptake, there are no improvements in a wide range of labour market outcomes.

abs-os125 The Effect of Welfare Reform in England on the Mental Health of Elderly Disability Benefit Claimants

PRESENTER: **Mr. Joe Spearing**
AUTHORS: Andrew Jones, James Lomas

In common with other developed countries, England is facing an ageing population with increasing numbers of disabled people. The share of the population over the age of 65 is projected to rise above 25%. The share of the population which is disabled is 18% and rising. Correspondingly, government spending on pensions and disability benefits are increasing, and many governments have implemented policy reforms seeking to slow or reverse this trend towards higher spending. In order to develop policy which promotes population health, policymakers need to understand the effect of these benefit programmes on their claimants' health, and the consequences of reducing the generosity of these programmes.

We study a reform to disability benefits enacted in the UK in 2013: the government replaced Disability Living Allowance (DLA) with a different benefit, Personal Independence Payments (PIP). PIP is similar to DLA in being non-taxable and non-means-tested, and also pays a similar amount. The eligibility criteria for PIP are stricter than DLA, however, with fewer automatic awards, an in-person health assessment in most cases, and fewer indefinite awards. PIP was first introduced on 8th April 2013 for new claimants, with existing DLA claimants reassessed for the new benefit over subsequent years. For elderly DLA claimants who may not have the means to adjust their labour supply to account for lower income, this reform may have caused anxiety, affecting their mental health. We measure mental health using the CESD score.

We exploit the following feature of the rollout: those DLA claimants who were aged over 65 at the time of the introduction of PIP were exempt from reassessment. This introduces a sharp discontinuity in exposure to the reassessment in date of birth at any given point in time. We exploit this discontinuity in a regression discontinuity design: effectively, we estimate the discontinuous change in CESD scores comparing those born just before 8th April 1948 (who are not exposed to the reassessment) to those born just after 8th April 1948 (who are exposed to the reassessment). Identification relies on the assumption that while confounders may vary continuously with date of birth, only treatment exposure varies discontinuously.

In order to demonstrate that the reassessments have the expected effect on claims, we show that those who are above the date of birth cutoff are statistically significantly more likely to claim PIP, and significantly statistically less likely to claim DLA. Turning to mental health effects, preliminary results suggest that the reform had an adverse effect on mental health, that is, those born just after the date of birth cutoff have higher CESD scores.

Our research contributes to the literature on the effect of disability benefits on health (Black, French, McCauley, and Song, 2018, Gelber, Moore and Strand, 2022, Silver and Zhang, 2022, Becker et al., 2024). We advance on the existing literature by studying disability benefits in a context of universal healthcare, where additional income is unlikely to be related to accessing treatments. Additionally, we consider new health outcomes, i.e., mental health.

abs-os122 Workforce Impacts of Subsidised Mental Healthcare: Evidence on Supply, Earnings, and Geographic Distribution

PRESENTER: **Trong-Anh Trinh**

AUTHORS: David Johnston, Anthony Harris, Nicole Black

Background: Mental health disorders are a major health burden globally, yet barriers such as high out-of-pocket costs limit access to mental health services. In 2006, Australia introduced the Better Access Initiative (BAI) to subsidise psychological services and improve accessibility, particularly in underserved areas. This study explores the supply-side impacts of the BAI, focusing on its effects on the size, composition, earnings, and geographic distribution of the psychology workforce. *Research questions:* Our research addresses three key questions: (1) Did the BAI increase the supply of psychologists and affect their work hours? (2) What were the income effects of the BAI on psychologists, and did these effects vary over time? (3) Did the BAI encourage psychologists to practice in non-metropolitan areas, thereby reducing geographical disparities in mental healthcare access? *Method and data:* We employed a Difference-in-Differences (DiD) approach, utilising data from the Australian Population Census and Australian Taxation Office records to compare psychologists (the treatment group) with a control group of allied health professionals unaffected by the BAI. *Findings:* Our findings indicate that the BAI significantly increased the psychology workforce by 47% within five years, largely driven by older and female psychologists entering the workforce. We observed minimal impact on average work hours per psychologist, suggesting that the increase in service capacity was primarily due to workforce expansion rather than increased hours among existing psychologists. In terms of income, psychologists experienced a 17% increase in annual earnings, likely reflecting the financial incentives provided by the subsidy. Income effects grew over time, indicating that psychologists were able to retain a portion of the subsidy as revenue. The BAI also contributed to a more equitable distribution of psychologists across urban and non-metropolitan areas, with an 8% rise in the likelihood of psychologists practicing in non-metropolitan regions. *Conclusions and implications:* Our study underscores the importance of considering both demand and supply factors in healthcare policy design, particularly for underserved regions. The BAI demonstrates that financial subsidies can effectively expand service capacity and address geographic disparities, offering a model for other countries aiming to improve mental healthcare access through similar initiatives. These findings have implications for policymakers seeking to enhance healthcare equity and support workforce development in mental health.

3:30 PM –5:00 PM MONDAY [Health Beyond The Health System]

os99 Bali International Convention Centre – Bali

Health-SES Gradients: Evidence from Asia, Europe, and the US

MODERATOR: **Jose Figueroa**, Harvard T.H. Chan School of Public Health

CONVENER: **Karen Eggleston**, Stanford University

DISCUSSANT: **Ellen Meara**, Harvard University; **Hongsoo Kim**, Graduate School of Public Health, Seoul National University; **Julie Shi**, Peking University; **Nikkil Sudharsanan**, Technical University of Munich

abs-os132 Health and Healthcare Inequalities by Income in the United States and South Korea

PRESENTER: **Sungchul Park**, Korea University

AUTHORS: Karen Eggleston, Young Kyung Do, David Cutler

Background: Income is a key determinant of health outcomes, affecting both the quantity and quality of life. While several mechanisms may drive the relationship between income and health, little is known about how these vary between countries. Understanding these differences is essential for developing targeted policies to effectively address income-related inequalities in health and healthcare in each country. In this study, we examine income-related disparities of adults in the United States and South Korea, countries with the 2nd and 4th highest poverty rates among OECD member countries. We investigate a wide range of health and healthcare outcomes to investigate the existence and magnitude of inequalities by income in each country.

Methods: We used four data sources: the US Medical Expenditure Survey for 2010-2019, the US National Health and Nutrition Examination Survey for 2009-2018, the Korean Health Panel Study for 2010-2019, and the Korean National Health and Nutrition Examination Survey for 2010-2019. Our analysis focused on a nationally representative sample of adults, stratified by age groups: 18–64 years and 65 years and older. We selected outcome variables with comparable definitions and coverage for the two countries, including healthcare spending, healthcare utilization, access to care, self-reported health status, functional limitations, risk factors, and clinical outcomes. Our primary independent variables were annual household income (adjusted for inflation using the GDP deflator), an indicator of the individual's country of residence (United States or South Korea), and the interaction term between these variables. We conducted a linear regression model after accounting for these primary independent variables while adjusting for age, an age-squared term, sex, and an interaction term between age and sex, and year fixed effects. Our key variables of interest were annual household income and the interaction term.

Results: We found similar patterns of income-related health and healthcare inequality in the United States and South Korea: higher income is associated with lower healthcare spending and better health outcomes, including self-reported health status, functional limitations, and clinical outcomes. However, we also identified several differences in gradients and potential mechanisms between the two countries. The relationship between income and healthcare utilization differed. In South Korea, higher income is associated with lower unmet medical needs, higher rates of routine checkups, fewer inpatient admissions and outpatient visits, whereas the reverse association between income and utilization is seen in the United States. Furthermore, gradients were less evident for health behaviors such as smoking and obesity. The overall health gradient by income was relatively consistent across age groups.

Conclusion: Our findings highlight the critical role of income as a determinant of health and healthcare in both the United States and South Korea. While similar trends in healthcare spending and health outcomes were observed in both countries, differential patterns in other outcomes suggest that the underlying mechanisms driving this relationship may differ. This suggests that income-related health inequality is nuanced and varies considerably between the two countries, reflecting differences in healthcare systems, socioeconomic structures, and cultural factors.

abs-os133 Health Gradients and Intergenerational Transmission by SES: Evidence from China

PRESENTER: **Karen Eggleston**, Stanford University
AUTHORS: Carol Shiue, Wolfgang Keller

Background: That individuals of higher socioeconomic status (SES) enjoy better health has been well documented for many populations globally. However, little is known about the evolution of this health-SES gradient ("Preston Curve") prior to the 20th century, and the extent to which intergenerational transmission of health and status played a role in the reproduction of the gradient. To help fill this gap, we analyze unique genealogical data from central China spanning multiple generations from 1675 to 1775.

Methods: We analyze the association between health as measured by lifespan and household SES in absolute and relative terms (i.e., as percentiles of the period-specific lifespan and SES distributions), as well as intergenerational transmission with a standard rank-rank regression. We also study maternal mortality, estimated as maternal death within 12 months of the birth of a surviving son. Status is measured in four categories based primarily with the civil service exam rank of the male head of household, as well as 30 descriptors in the genealogical entries related to official position, occupation, investments, household structure, and other indicators of wealth and status.

Preliminary results: We find that top status men live about five years longer than men with low status. Exploiting our intergenerational setting, we present new evidence on the role of health for status by showing that long-living fathers tend to have rich sons, whereas sons of rich fathers do not live longer than sons of poorer fathers. Intergenerational status persistence is much higher than intergenerational lifespan persistence, but money cannot buy much health in this society. In contrast, a long lifespan enables men to rise in social status by participating in China's civil service examination and gaining official positions. We also show that child and maternal mortality are subject to a status gradient during the sample period.

Discussion: Studying 17th and 18th century China, we document the evolution of the health-status gradient across multiple generations. Based on rich genealogical data that includes clear markers of status defined by China's national civil service examination system, we find that compared to married men without any evidence of wealth or status, those who achieved the highest rank lived on average five years longer. This gradient in adult lifespan by status, although seemingly modest, was of comparable magnitude to several decades of survival improvement in industrializing England.

Leveraging the intergenerational linkages in our data, we find that lifespan persistence is a stronger predictor of the health-status gradient than status persistence across generations, despite the latter magnitude far surpassing the former. Wealth evidently could not buy significantly better health with any degree of certainty in this society. Rather, longer lives allowed time and opportunity to climb the social status hierarchy – in our setting, by enabling healthy men to pass successive levels of the civil service exam. Clan solidarity also meaningfully shaped economic outcomes including intergenerational transmission of status; but within-clan redistribution did not significantly reduce variability of lifespan.

abs-os130 The Wealth Mortality Gap in the US and Europe

PRESENTER: **Irene Papanicolas**, Brown School of Public Health
AUTHORS: Sara Machado, Ilias Kyriopoulos, E John Orav

Background:

Amid growing wealth disparity, we have little information on how older Americans' health compares to Europeans across the wealth distribution. This study examines the association between wealth and mortality in the US and Europe.

Methods:

This longitudinal retrospective cohort study includes adults aged 50-85 from the US Health and Retirement Study (HRS) and the European Survey on Health, Aging, and Retirement in Europe (SHARE), from 2010-2022. Wealth quartiles were defined by age group and country. Mortality rates and Kaplan-Meier curves were estimated per wealth quartile across the US and 16 countries in Continental, Southern and Eastern Europe. Cox proportional hazards models adjusted for baseline covariates (age, gender, marital status, education, rural area, smoking, and diagnosed chronic conditions).

Results:

Among 73,838 individuals, aged (mean) 65 (SD) 9.8, 13,802 (18.7%) died during 10-year median follow-up. Kaplan-Meier survival curves showed higher survival rates for all wealth quartiles in Continental Europe compared to the wealthiest US quartile (log rank test, p=0.000). The US had a wider survival gap between the top and bottom wealth quartiles compared to Europe. Across all participants in both surveys, the wealthiest quartiles had lower mortality (adjusted hazard ratio [aHR, 95% confidence interval] Q2: 0.84, 0.80-0.88; Q3: 0.71, 0.68-0.75; Q4: 0.64, 0.61-0.68) than the poorest quartile. Continental Europeans had higher survival rates, for all quartiles, when compared to HRS.

Conclusions:

This study highlights a wealth-mortality gap among older adults, which is more pronounced in the US than in Europe. Although wealthier Americans tend to live longer than poorer Americans, those in the highest wealth quartile in the US have worse survival rates than the poorest

in Continental Europe.

abs-os127 Trends in Heart Disease Among Americans by Socioeconomic Status

PRESENTER: **David Cutler**

Background: Heart disease is the leading cause of death in most rich countries. Several risk factors for heart disease are well known, including high blood pressure, high cholesterol, and diabetes. Further, there are pharmacological and behavioral treatments for each. Thus, many acute heart disease events are preventable. Yet trends in heart disease differ greatly by education. In the United States, since 2000, heart disease mortality has increased for people without a BA but has declined for people with a BA. These differential trends are a major contributor to differential changes in life expectancy by education. Understanding why these trends differ is thus a major research issue.

Methods: This paper will compare heart disease death rates and risk factor control in the US by socioeconomic status. The data will come from the National Health and Nutrition Examination Survey (NHANES). Socioeconomic status will be measured by education: a high school degree or less, some college education, and a BA or higher. The NHANES also measures blood pressure, and draws blood for analysis of cholesterol and diabetes.

The analysis will have two parts. First, I use risk prediction equations for the probability of death as a function of demographics and clinical factors (blood pressure, cholesterol, diabetes) to understand the differential trend in mortality for more and less educated Americans. The analysis considers how much of the differential trend in mortality rates is due to adverse risk factor trends, and which rick factor changes have been more adverse for less-educated Americans. The second part of the analysis seeks to understand why risk factor control has been less effective for less-educated Americans. I will divide trends into four explanations: (1) different levels of underlying risk (e.g., larger increases in obesity rates among less-educated Americans); (2) different rates of awareness of disease; (3) differential treatment trends conditional on awareness; and (4) differential rates of control among those treated. These results will indicate which types of interventions are most important in combatting the differential trend in heart disease mortality by education.

Results: According to preliminary results, the most important explanation appears to be that obesity rates have increase more among people with fewer years of education, and this raises the risk of adverse heart disease events. Treatment rates are roughly similar by education group and over time, so differential trends in control of risk factors are less important than differential trends in the underlying risk factors themselves. If these results hold up in further tests, this pattern would have major implications for how the US should confront differential mortality trends by education.

Conclusion: Given the importance of heart disease in explaining the differential mortality burden across population groups, it is essential to understand the differences in outcomes for groups with better and worse experiences. These data and this setting present an ideal opportunity to examine the growing gap in health by socioeconomic status.

5:15 PM –6:15 PM MONDAY [Special Interest Group Sessions]

Bali International Convention Centre – Jakarta B

Meeting of the Economics of Children's Health and Wellbeing Special Interest Group

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5:15 PM –6:15 PM MONDAY [Special Interest Group Sessions]

Bali International Convention Centre – Karangasem

Meeting of the Economics of Palliative and End-Of-Life Care Special Interest Group

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5:15 PM –6:15 PM MONDAY [Special Interest Group Sessions]

Bali International Convention Centre – Orchid

Meeting of the Economics of Digital Health Technology Special Interest Group

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5:15 PM –6:15 PM MONDAY [Special Interest Group Sessions]

Bali International Convention Centre – Executive Room 2

Meeting of the Teaching Health Economics Special Interest Group

5:15 PM –6:15 PM MONDAY [Special Interest Group Sessions]

Bali International Convention Centre – Hibiscus

Meeting of the Financing for Universal Health Coverage Special Interest Group

5:15 PM –6:15 PM MONDAY [Special Interest Group Sessions]

Bali International Convention Centre – Bandung

Meeting of the Economics of Genomics and Precision Medicine (Econ-Omics) Special Interest Group

5:15 PM –6:15 PM MONDAY [Special Interest Group Sessions]

Bali International Convention Centre – Surabaya

Meeting of the Health Workforce Special Interest Group

5:15 PM –6:15 PM MONDAY [Special Interest Group Sessions]

Bali International Convention Centre – Bali

Meeting of the Health Preference Research Special Interest Group

5:15 PM –6:15 PM MONDAY [Special Interest Group Sessions]

Bali International Convention Centre – Nusa Dua

Meeting of the Economics of Obesity Special Interest Group

5:15 PM –6:15 PM MONDAY [Special Interest Group Sessions]

Bali International Convention Centre – Bougainville

Meeting of the Mental Health Economics Special Interest Group

5:15 PM –6:15 PM MONDAY [Special Interest Group Sessions]

Bali International Convention Centre – Frangipani

Meeting of the Economics of Risky Health Behaviors Special Interest Group

Tuesday

8:30 AM –10:00 AM TUESDAY [Health Care Financing & Expenditures]

Bali International Convention Centre – Jasmine

Strategic Purchasing for UHC

MODERATOR: **Agnes Gatome**,

Ind-931 Is Malawi's Health System Positioned to Achieve Universal Health Coverage Goals? An Assessment of Strategic Health Purchasing at Primary Health Care

PRESENTER: **Norah Mwase**
AUTHORS: Timange Banda, Madalitso Tolani, Tisha King, Moses Zuze, Shadrack Gikonyo, Boniface Mbuthia, Joyce Murerwa, Lizah Nyawira

Strategic Health Purchasing has potential to address health system inefficiencies and advance towards Universal Health Coverage. However, limited evidence exists on the progress made in strategic health purchasing in Malawi and how it can be enhanced. This study aims to assess the progress, gaps and opportunities in strategic health purchasing among major purchasers of health in Malawi to inform strategic purchasing reforms.

We utilized the Strategic Health Purchasing Progress Tracking Framework to collect data on key domains of purchasing such as benefit specification, provider contracting, payment and performance monitoring arrangements, governance and financial management through analyses of relevant documents and key informant interviews.

The findings revealed progress in: 1) Enabling policy frameworks that prioritize implementation of strategic purchasing reforms 2) Cost-effective benefit package accessible to all Malawians at no cost 3) Provider payment mechanisms include input-based payments, fee-for-service and global budgets 4) Selective contracting with some faith-based providers 5) Multiple performance monitoring arrangements like supportive supervision and information management systems exist. However, limitations persist including passive provider payment mechanisms, limited provider autonomy especially for primary health care facilities and rigid public financial management systems.

Addressing these gaps is critical in achieving universal health coverage. Drawing lessons from SLA to strengthen direct facility financing, prioritizing PFM reform to allow recognition of primary health facilities as cost centers and strengthening performance monitoring arrangements to allow integration of health information systems are essential.

Ind-1505 Understanding the Experience and Perceptions of Providers and Purchasers for Payment Methods in Tanzania.

PRESENTER: **John Joseph Maiba**, Ifakara Health Institute
AUTHORS: Peter Binyaruka, Timothy Powell-Jackson, Gemini Mtei, Sally Mtenga, Francis Donard Ngadaya, Josephine Borghi, Iddy Mayumana, Gemini Mtei

ABSTRACT.

Background: Many Low- and Middle-Income Countries (LMICs) are reforming health financing to achieve Universal Health Coverage. Given limited resources in most contexts, there is a recent move toward strategic purchasing of health services, requiring strategic decisions on purchasing services, including efficient provider payment methods (PPMs). PPMs could incentivize either intended or unintended provider behaviors and may affect efficiency, equity and quality of health service delivery. Tanzania plans to implement universal health insurance (UHI), but some design elements including PPMs are not yet decided. We studied the experiences and perceptions of providers and purchasers over existing PPMs in Tanzania, to inform the designing of optimal PPMs for UHI in Tanzania.

Methods: We conducted 35 in-depth interviews with healthcare workers from 21 primary healthcare facilities and four district-level health managers in two regions (Manyara and Singida). We also interviewed 6 purchasers from government and health insurance schemes. The interviews focused on two main payment methods in Tanzania, capitation and fee-for-service (FFS); by discussing the associated characteristics, including revenue contribution, predictability of payment amount, adequacy of payment rates, timeliness, accountability mechanisms, and autonomy in resource allocation. Transcribed interviews were analyzed thematically.

Results: Capitation for the Health Basket Fund (HBF) and FFS for the National Health Insurance Fund (NHIF) were seen as significant revenue contributors. In contrast, capitation for the Improved Community Health Fund (iCHF) and Social Health Insurance Benefits (SHIB) was seen as not contributing enough. FFS for NHIF is seen as more predictable, while capitation funds across various schemes were not, due to unclear adjustors, payment schedules and delays, and enrolment members. Both payment rates for all PPMs were perceived as inadequate to cover service costs, partly because of low rates or deductions. All PPMs reported delay in payment but with less delay for NHIF-FFS compared to capitation for HBF and iCHF. Spending autonomy is adequate, supported by direct facility financing and guidelines, though some face hurdles. Reporting requirements for all PPMs are seen as adequate. Finally, FFS was preferred for motivation, while capitation was valued for its reliability in some cases. Insights from health managers and purchasers are pending analysis.

Conclusion: The experiences of healthcare providers and purchasers highlight key insights for designing a PPM for UHI in Tanzania. For effective PPM, the design and implementation should embrace transparency of payment adjustors, timely disbursements, increasing autonomy in fund allocation, aligning payment rates with service costs, and simplifying administrative processes.

Keywords: Capitation, Fee for service, Primary healthcare, Provider payment methods.

Ind-711 Innovation Procurement in the Strategic Purchasing Function of the Universal Coverage Scheme: A Case Study from the Thai Innovation List

PRESENTER: **Arpaporn Sutipatanasomboon**
AUTHORS: Siriyada Kitbamrung, Teerawat Wiwatpanit, Yi Wang, Yot Teerawattananon

Aim

To conceptualize how innovation procurement integrates into the strategic purchasing function of Thailand's Universal Coverage Scheme (UCS).

Background

Launched in 2002, UCS is Thailand's largest public health insurance scheme, covering over 70% of the population. The scheme is financed by an annual central budget and managed by The National Health Security Office (NHSO); an autonomous public agency overseen by the multi-stakeholder National Health Security Board (NHSB). Healthcare services are provided by contracted providers who independently procure medical products and receive reimbursement based on capitation, Diagnostic Related Group rate, and fee schedule for high-cost interventions. The NHSO also leverages its position by negotiating the price of medical products, procuring and distributing them to providers.

In 2015, the government introduced the Thai Innovation List (IL), an initiative to stimulate domestic research and development (R&D) investment. Organizations or individuals can register their innovative products and services developed or improved in Thailand in exchange for price disclosure. The initiative enables government agencies to purchase IL-listed products even if they are not the most competitive options available and mandates them to allocate at least 30% of their annual procurement budget to IL-listed products. This mandate affects most UCS healthcare providers, as most of them are government health centers and district hospitals.

Methods

This study analyzes the consequence of the IL initiative on UCS's strategic purchasing function, focusing on changes made to accommodate the initiative.

We are reviewing minutes from the Working Group for Health Economics (WGHE), the Subcommittee for the Development of Benefits Package and Service Delivery (BPSD Subcomittee), and the NHSB meetings from 2015 to 2023. The WGHE conducts economic evaluations of new products or services nominated for inclusion into the benefit package, forming the basis for BPSD's recommendations to the NHSB, which makes the final decisions, including the financing of existing and new benefits.

Additionally, we will conduct a landscape analysis of technologies relevant to the IL-registered products using patent documents, intellectual property and medical product registration records, and literature related to developers indicated in the IL registration.

Results and Expected Outcomes

In 2016, the NHSB adopted the initiative as one of the tactics to ensure financial efficiency. The goal was to allocate at least 30% of their centrally procured medical products to IL-listed items, with a proposal to increase the allocation to 50-100% for locally manufactured high-cost interventions. By the end of 2023, a handful of interventions with IL-listed products have received IL-tailored preferential treatments, including colostomy bags and customized 3-Dimensional-Printed titanium cranial implants.

Further analysis will identify key factors influencing decision-making and illustrate the technological positioning of the IL-registered products in Thailand. Overall, our work will provide insights into innovation procurement within UCS's strategic purchasing framework, highlighting challenges and opportunities to optimize the use of strategic purchasing in a public health insurance scheme to stimulate domestic R&D productivity in an upper-middle income setting.

Ind-450 Understanding Health Providers' Decision-making and Behavioural Responses to Case-based Payment Reform in China

PRESENTER: **Xiaoying Zhu**
AUTHORS: Daniel Strachan, Tiara Marthias, Ajay Singh Mahal, Shenglan Tang, Barbara McPake

Abstract

Background: To address rapidly increasing healthcare expenditures of social health insurance, the Chinese government has recently introduced provider payment reform, transitioning from a fee-for-service model to a case-based payment system. The case-based payment method transfers the risks associated with healthcare expenditures from the payer to the provider incentivising them for cost control. While existing studies have provided statistical evidence for some changes in healthcare practices following the payment method reforms, evidence for how providers understand the reforms and respond to them in their decision-making processes remains limited.

Objective: Our study aims to investigate how hospital-based physicians have responded to case-based payment system reform in China and examine how this influences factors considered in clinical decision-making.

Methods: Qualitative in-depth interviews with physicians were conducted in Nanjing, China in 2024. 22 physicians working in hospital inpatient departments were purposively sampled for interview while ensuring representation across different medical specialties and career stages. Thematic analysis was conducted on the verbatim transcriptions of digital recordings of face-to-face, semi-structured interviews with the informed consent of participants.

Results: We find that physicians simultaneously serve as agents for health insurance, hospitals and patients, with their service delivery decisions shaped by awareness of the principals that underpin these priorities. Under the case-based payment methods, participants identified priorities of the health insurance authority as cost control, efficiency, and standardised clinical practice, the hospital's priorities as revenue generation and institutional reputation, and patients' priorities as care accessibility, financial burden reduction, and outcome optimisation. We

identified five tensions across these agency relationships: clinical quality versus cost containment; professional autonomy versus regulatory constraints; policy compliance versus patient preferences; immediate benefits versus future sustainability; and information asymmetry across physicians, health insurers and patients and relatedly, physician's perceived pressure to bridge gaps in policy awareness. These tensions have brought out stress reported by physicians attributed to concerns for vulnerable patients, potential for strained patient relationships, and perceptions of needing to expand their role and skillsets from physician to accountant.

In their clinical decision making, physicians balance the priorities of all three agency roles while considering the cost-benefits trade off when managing the above tensions. They choose the levels of health service based on assessments of patient benefits relative to hospital profit. Insufficient services might be provided if their perceived patient benefits are relatively lower. Notably, when hospitals implement direct insurance payment-related income incentives, physicians show strong awareness of hospital profit considerations, leading to unintended behaviours such as treatment delays for secondary health issues, selective patient admission, unbundled medical procedures and strategic coding practices. However, mediating factors such as physician's own interests, ethical considerations, risk aversion, professional values, and the design of monitoring schemes, influence how these impacts play out.

Conclusions: Our study contributes to understanding of how hospital-based physicians in China respond to case-based payment reform and to broader theoretical application of agency theory. While standard agency theory often simplifies physician's motivation, our findings reveal physicians are bound by professional ethics and multiple agency relationships, suggesting policymakers should look beyond simple economic incentives.

Ind-1905 Improving Access and Financing Efficiency to Maternal and Neonatal Health Services through Strategic Health Purchasing

PRESENTER: **Ririn Ariani Dewi**

AUTHORS: Rizki Tsalatshita Khair Mahardya, Muhammad Akmal Farouqi, Kefas Christiawan, Hasbullah Thabrany, Astara Lubis, Iko Safika, Firdaus Hafidz, Amalia Zulfah Wijaya, Anastasia Susanto

Background: Indonesia continues to face challenges in reducing maternal mortality rate. In 2020, the MMR reached 189 per 100,000 live births. The problem identified is related to the low coverage of complete six times antenatal visits and unnecessary referral from Primary Health Care (PHC) to the hospital. The Strategic Health Purchasing (SHP) concept strengthens Maternal Neonatal Health (MNH) services to incentivize providers to increase access to MNH services and influence providers' performance at the PHC level. USAID Health Financing Activity (HFA) provided supporting technical assistance to the Ministry of Health (MOH) and The National Health Insurance Agency (BPJSK) to implement a pilot of SHP MNH to improve access, quality, and financing efficiency between October 2022 and October 2023 across 12 public and 28 private PHCs in two districts in Indonesia. This study aims to evaluate the impact of SHP MNH on access, quality, and efficiency of MNH services at the PHC level. **Methodology:** This study employed a mixed-method approach to assess providers' behavior in providing ANC services, the number of service claims, and financing efficiency by shifting services from the hospital to the PHC level. Data were obtained from the BPJSK Serang branch, National Health Insurance data, and health facilities survey. Qualitative data were collected through focus group discussions (FGDs) with health facilities and key stakeholders. Data analysis used descriptive statistics, chi-square test, and difference-in-difference to measure access to services, data envelopment analysis (DEA) to measure efficiency, and thematic analysis for qualitative data. **Key Results:** The SHP MNH pilot indicates a positive impact on the behavior of PHCs in the intervention group, leading to a higher number of PHCs submitting claims for ANC services from 13 to 23 out of 40 PHCs in the intervention group, which was statistically significantly different compared to the control groups ($p \leq 0.005$). Intervention PHCs experienced a substantial increase in claims, producing 436 more ANC service claims than the control group ($p \leq 0.01$). The average claim cost for ANC services in the intervention period was Rp156,510 (Indonesian Rupiah)/service, a decrease of 20% from Rp194,827 (Indonesian Rupiah)/service in the baseline period, indicating efficiency. An increased utilization of ANC services at intervention PHCs by 121% was observed. DEA analysis also showed the relatively high efficiency of ANC services after intervention. Lastly, FGDs revealed that the SHP MNH increased motivation among intervention health facilities to submit claims and improved cross-sectoral coordination. **Conclusion:** The MNH SHP intervention resulted in providers' motivation and performance, indicating better access to essential services for mothers and reduced the average claims per service, indicating efficiency. SHP MNH highlighted the financial and non-financial components that influenced the program outcomes. Non-financial aspects of the intervention, like strong coordination between stakeholders, capacity building, and routine monitoring of PHCs, were crucial for improving access and quality of MNH services. **Keywords:** Strategic health purchasing, maternal and neonatal health, primary health facilities **Field:** Health Financing and Expenditures

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8:30 AM –10:00 AM TUESDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Singaraja

Demand for and Utilization of Primary and Secondary Care

MODERATOR: **Dan Maggio**, Rutgers University

Ind-1354 How Health Financing Affects Maternal Delivery Decisions: Case of C-section Rates in SSIP in Punjab, Pakistan

PRESENTER: **Zahid Ali Memon**, The Aga Khan University

AUTHORS: Ahsana Nazish, Ali Razaque, Tooba Khan, Iqbal Azam, Sameen siddiqi, sabin Nasir, Rahema Hasan, asim Muhammad, Dr Shabana Haider, Zafar Ahmed

Background: The Sehat Sahulat Insurance Program (SSIP) was launched in Punjab, Pakistan in 2016 to improve access to healthcare and provide financial protection for low-income families. Globally, C-section rates are rising, projected to reach 30% by 2030, with significant increases in developing regions. In Pakistan, C-section rates rose from 14% in 2012-13 to 22% in 2017-18, with higher rates among educated, urban, and wealthy women. Similar trends have been reported internationally after introducing the national insurance programs. **Study Rationale:** While the global and national trends are well documented, few studies have explored the impact of health financing on C-section rates through the lens of incentive structures and reimbursement rates. This study fills this gap by analyzing C-section rates across different phases of the SSIP implementation and its association with financial incentives, provider types, patient characteristics, and policy shifts. **Research Question:** To what extent have financial incentives within SSIP influenced institutional deliveries and C-section rates across its rollout phases in Punjab, and how do stakeholders perceive their role in delivery decisions? **Methods:** This mixed-method study included desk review, secondary data analysis, and qualitative interviews. Program documents and reports were reviewed to assess the evolution of SSIP policies and financial mechanisms. Secondary data included 993,380 deliveries recorded between October 2016 and August 2024; after excluding records with incomplete information and out-of-province deliveries, 978,004 were analyzed. Additionally, qualitative interviews with women, family members, healthcare providers, and insurance personnel provide insights into factors influencing maternal delivery decisions. Data triangulation provides a comprehensive view of delivery patterns and decision-making processes. **Results:** The desk review revealed the evolution of SSIP from limited district coverage in Phase I (2016-2018) to universal access in Phase III (2022-2024), with maternal services being an integral component. A fee-for-service reimbursement model was used, with higher tariffs for C-sections compared to normal deliveries, particularly in private hospitals. This disparity may have incentivized providers to favor C-sections. Preliminary analysis of secondary data reveals a consistently high C-section rate of 75.73% (95% CI: 75.65%, 75.82%) across Punjab. C-section rates varied significantly across program phases, lowest in Phase I (71.58%,n=12,341) and highest in Phase II (78.14% ,n=47,614). The majority of the women delivered (93.87%) during Phase III. Private hospitals reported a notably higher C-section rate (80.88%) as compared to public hospitals (66.18%). Regional variations were evident, with Rawalpindi division recording the lowest rate (61.51%) and Sahiwal division the highest (85.48%). 90% of deliveries were conducted under the Federal SSIP Phase III project. The findings suggest that financial incentives, reflected in tariff structures, will likely influence delivery mode decisions under SSIP. **Conclusion and Implications:** This study highlights the potential role of financial incentives, including tariff disparities, in shaping delivery mode decisions under SSIP. Ongoing qualitative research will provide deeper insights into contextual and systemic factors. Evidence-based reforms targeting reimbursement models and provider incentives could mitigate unnecessary C-sections, improving maternal outcomes and guiding future health financing strategies.

Ind-1470 The Catch-Up of Fertility After Family Planning Services: Evidence from Malawi

PRESENTER: **Dan Maggio**
AUTHORS: David Canning, Tanya Rajan, Mahesh Karra

Significance/Background Roughly 14 million unintended pregnancies occur in Sub-Saharan Africa each year. Improving access to family planning may promote contraceptive use after childbirth and reduce the likelihood of closely spaced births; however, little is known about fertility dynamics after these programs end. On one hand, if couples are unable to match their realized and idealized preferences for birth parity, we may expect to see persistent reductions in fertility following program cessation. On the other, if couples primarily exhibit a preference for healthy inter-pregnancy intervals, we may expect to observe catch up. **Research Question** We assess the causal impact of improved access to family planning three years after program cessation using experimental evidence from a randomized controlled trial in urban Malawi. We primarily study the impacts of the intervention on medium-term fertility, while also revisiting short term positive findings on contraceptive use, children's health, and household labor force outcomes. **Methods** We present evidence from a field experiment conducted in Lilongwe, Malawi between November 2016 and February 2019. 2,143 women, who were either pregnant or postpartum at baseline, were randomly assigned to receive a comprehensive family planning package that included home-based counseling, transport to a high-quality family planning clinic, and free family planning services. This paper presents results from a five-year follow-up survey conducted between November 2021 and May 2022, roughly 2.5-3 years following the end of the program. We present the effects of the intervention among 1,499 women who were re-interviewed during our follow-up survey on fertility, contraceptive use, and employment outcomes. We also present follow-up evidence on growth patterns and cognition for a subset of children who are re-interviewed. **Key Findings** Although short-term results suggested that women were less likely to have a subsequent pregnancy during the trial, our medium-term follow-up provides evidence of substantial catch-up after the end of the program. We also do not find evidence of higher contraceptive use among treatment women, and there is evidence that women substitute away from implants toward injectable contraceptives – this contrasts with short-term findings where women substituted *toward* implants. As may be expected given the growing literature on fadeout in child health effects, we do not find evidence that the short-term effects observed on children's development were sustained in the medium term. Additionally, as one may expect as fertility among treatment women catches up to their counterparts, we also see fade-out of the employment effects observed in the short-term. **Knowledge Contribution** Although a growing literature has shown that family planning services are effective at improving contraceptive and fertility concordance, there is little evidence that tracks fertility and contraceptive dynamics after programs end. Our results suggest that the effects of one program implemented in Urban Malawi faded away after three years. More broadly, these results suggest two things. First, that couples in Malawi exhibit a preference for control over birth spacing rather than birth parity. Second, perhaps the information treatments included in the intervention did not drive the short-term results.

Ind-2082 Barriers to Access and Utilization of Maternal and Neonatal Health Commodities in Zambia: An Analysis of Supply Chain and Demand Challenges

PRESENTER: **Zeddy Chansa**
AUTHORS: Ibrahim Abdallah, Rabson Zimba, Nelia Banda, Maxwell Kasonde, Kalizya Sinyangwe

BACKGROUND: Maternal and neonatal health outcomes in Zambia remain critically poor, with maternal mortality at 252 deaths per 100,000 live births and neonatal mortality at 27 per 1,000 live births—well above global averages [(ZDHS, 2018; World Bank, 2020; UNICEF, 2021)]. Systemic inefficiencies in supply chains and sociocultural barriers exacerbate these challenges. Stock-out rates for life-saving drugs such as

oxytocin and magnesium sulphate range between 30%-50%, driven by procurement delays averaging 4-6 months and logistical inconsistencies [(WHO Zambia Report, 2022)]. These shortages hinder timely interventions for postpartum haemorrhage and preeclampsia, leading to preventable complications. On the demand side, institutional delivery rates are low at 63%, with 45% of women lacking adequate health literacy and 30% avoiding healthcare due to cultural beliefs and misconceptions about institutional care [(Zambia Gender and Health Study, 2019)]. Traditional preferences for home births and limited awareness of medical interventions further compound mortality risks, underscoring the urgent need to address both systemic supply inefficiencies and sociocultural challenges [(ZDHS, 2018; WHO Zambia Report, 2022)]. **RESEARCH AIM** This study seeks to identify and evaluate supply chain inefficiencies and demand-side barriers to accessing maternal and neonatal health commodities in Zambia, providing actionable solutions to improve health outcomes. **METHODS** A mixed-methods approach was employed over nine months, from January to September in 2024. Quantitative data was collected from the electronic Logistics Management Information System (e-LMIS) and Quantification Analytics Tool (QAT), analysing forecasting accuracy, procurement lead times, stock availability, utilization rates, and reporting compliance. Qualitative interviews explored cultural and institutional barriers, focusing on community-level health literacy and traditional practices **RESULTS** Central-level supply chains exhibited forecasting deviations averaging 15%, driven by insufficient historical data and weak demand signals. Procurement lead times, averaging 3.5 months, resulted in stockouts in 18% of cases, affecting oxytocin and antibiotics availability. Maternal health commodities were available in 78% of facilities, but neonatal supplies were unavailable in 34%, increasing mortality risks from postpartum haemorrhage and neonatal infections. Facility-level utilization rates showed better performance for maternal (85%) compared to neonatal supplies (65%), attributed to underuse of equipment like kangaroo care wraps. Cultural resistance and fragmented data systems further compounded these issues. Entrenched beliefs and low health literacy limited the service uptake, with only an 8% increase in nine months, despite interventions. Poor inventory management and misaligned stock levels also hindered equitable access. **CONCLUSIONS AND IMPLICATIONS ON POLICY** Improving maternal and neonatal health in Zambia requires targeted reforms. Central-level actions should enhance forecasting accuracy, streamline procurement processes, and integrate data systems. Facility-level efforts must focus on real-time reporting, demand-responsive supply chains, and equitable stock distribution. Concurrently, community engagement initiatives should address sociocultural barriers and promote health literacy. Together, these strategies can mitigate preventable deaths and provide a replicable model for similar contexts.

Ind-2100 Determinants of Inpatient Care in Hospitals and Adverse Selection in Service Delivery

PRESENTER: **Dedy Revelino Siregar**
AUTHORS: Khaterina Manurung, Wan Aisyiah Baros, Donni Hendrawan, Mahlil Ruby

Backgrounds: Indonesia established the National Health Insurance (NHI) program, operated by Badan Penyelenggara Jaminan Sosial Kesehatan (BPJS-K), in 2014. Since then, the program has significantly developed in terms of enrollees and public health services. A major issue is the growing number of inactive enrollees—those who fail to pay premiums regularly. This percentage increased from 9% in 2019 to 19% in 2022 and has remained above 19% in 2024, indicating a serious problem with payment compliance. One key issue is the behavior of informal participants, who often become active due to illness or childbirth but then default on their contributions once they recover. Therefore, it is important to explore the behavior of informal participants through data analysis to better understand how many are active, giving birth, in arrears on contributions, and to assess the delivery costs and the duration for which participants remain active in paying their contributions. Methods: A cross-sectional method was used with quantitative data on the delivery rates of participants at hospitals over a period of 29 months (2022–2024), covering a total of 6,612,282 participants. The analysis employed descriptive statistics and logistic regression. Independent variables assessed included age group, type of delivery, membership segment, member status, and discharge status. The dependent variable in this study was participant payment compliance, specifically whether it was active or not active in the National Health Insurance program. Results: Logistic regression analysis was employed to assess the odds ratio of participants with a history of delivery, comparing active versus non-active participants in the National Health Insurance program. The statistical results show significant odds ratios for the following variables: discharge status (OR 17; $p = 0.07$), age group (OR 10; $p = 0.00$), member status (OR 11; $p = 0.09$), membership segment (OR 9.4; $p = 0.00$) and type of delivery (OR 8,7; $p=0.00$). The proportion of participants who had deliveries and paid contributions both before and after the service was 79% of the total participants, while those who did not pay contributions regularly before and after the service comprised 21% of the total participants. In summary, 29% of participant deliveries were from contributory assistance participants from the central government, while 24% came from participants in the formal sector. Conclusions: Non-compliance among participants who do not pay contributions regularly, primarily from the informal sector, accounts for 63% of participants with inactive payment status. This issue of non-compliance is common across countries where such delivery services are provided. Therefore, it is essential to establish regulations and policies regarding waiting periods and minimum payment periods following delivery. Keywords: Delivery Services, Adverse Selection, National Health Insurance.

Ind-2826 Decomposing Rural-urban Differences in Prenatal Care Initiation in Taiwan

PRESENTER: **Ching-Ching Claire Lin**
AUTHOR: Tung-Hsien Wu

Objective: Timely prenatal care, identifying risks and reducing potential pregnancy complications, is a critical intervention to address rising maternal death. WHO suggests women to initiate prenatal care at or before 14th week of pregnancy. Achieving this goal, however, could be challenging for rural residents, as they tend to be with higher likelihood of smoking and alcohol use, and with scarce healthcare resources and lower obstetrician-gynecologist supply. Yet the rural-urban differences in initiation of prenatal care as well as causes of such differences are not well understood. This study aims to understand rural-urban differences in delayed initiation of prenatal care, as well as the extent to which these differences are explained by socio-demographics, behavioral risk, and OB-GYN availability. **Methods:** We analyzed Taiwan National Health Insurance Database linked to birth registries to investigate rural-urban differences in late initiation of prenatal care among all women beneficiaries with single delivery hospitalization in 2019. Residing counties were classified as urban or rural based on urbanization index validated by prior studies, a weighted index of the population density, educational levels, population ratio of elder people (65+) and agriculture workers, and the total number of physicians. Delayed prenatal care was defined as “a woman had not had the first prenatal visit” at the following different timepoints (yes/no): (1) during the first trimester (12th, 14th week) of pregnancy; (2) before or during the second trimester (28th, 30th week). We first compared timing of first prenatal care visit between rural and urban women, controlling for socio-demographic

characteristics (age, family income, immigrant status), behavioral risk (smoking or alcohol use during pregnancy), comorbidities, and availability of obstetrician-gynecologist at county-level. We used Blinder-Oaxaca decomposition to assess the extent to which rural-urban differences in late initiation of prenatal care are explained by socio-demographics, behavioral risk, and county-level obstetrician-gynecologist availability. **Results:** For all 130,730 women with single delivery hospitalization in 2019, women in rural areas are associated with lower likelihood of missing their first prenatal visit at 12th week (Rural vs urban 28.39% vs 30.01%, $p<0.001$) and 14th weeks (Rural vs urban 17.82% vs 19.13%, $p<0.001$), but with higher likelihood of still missing prenatal care at 28th week (Rural vs urban 1.90% vs 1.70%, $p<0.023$) and 30th weeks (Rural vs urban 1.44% vs 1.27%, $p<0.033$). Decomposition analysis showed that, only 43% of the rural-urban differences in missing first prenatal visit during the first trimester was explained by the measured variables, but the entire rural-urban differences in 28- and 30-week outcomes were explained by measured variables. For all four outcomes, proportion explained by socio-demographics and behavior characteristics were greater than proportion explained by availability of OB-GYN. **Conclusions:** A greater proportion of rural women had not had their first prenatal visit during the third trimester, compared to those in urban areas. Furthermore, differences in rural-urban socio-demographics explained more differences in late initiation of prenatal care than availability of OB-GYN did. While addressing maternal workforce issues is critical, more policy efforts should target on different socio-economics disadvantageous groups.

Ind-619 Inequity in Child Mental Healthcare Use

PRESENTER: **Trong-Anh Trinh**
AUTHORS: Nicole Black, David Johnston

Background: Worldwide, many children with mental health issues do not receive adequate treatment. A core objective of most health systems with universal coverage is equitable access to needed medical care, regardless of ability to pay. While access to general practitioners has been found to be largely based on need, there is a concerning tendency for pro-rich inequities in access to more specialised services. Such inequities are especially concerning when they affect children and adolescents with mental health disorders. However, we know little about the extent of inequity in children's mental healthcare. **Objectives:** We aim to investigate the importance of household income in determining whether Australian children with poor mental health receive mental healthcare. **Methods**: We use a longitudinal dataset of Australian children aged 10-17 years, that uniquely measures both mental health need (parent and child reports and GP records) and mental health care use (through linked health care records). Conditioning on mental health need, local area fixed effects and child and parental characteristics, we employ between- and within-child analyses to estimate the income inequity in mental health care use. **Results**: We find no evidence of an income gradient in accessing GP mental health services. However, conditional on receiving a GP mental health treatment plan, children from low-income families are significantly less likely to see a psychologist, particularly a clinical psychologist, and less likely to receive prescription medication for emotional disorders within 3 months compared with children from higher income households. The findings are consistent across different measures of low income and treatment time windows. We show that differences in out-of-pocket fees are a likely explanation. **Discussion**: Psychologist services can have high out-of-pocket costs, even when subsidised by public health insurance. Our findings highlight that specific support to low-income families is needed to reduce inequities in accessing a complete range of mental health services.

Ind-822 An Evaluation of Demand for Child Health Care in Four Selected West African Countries: Nigeria, Ghana, Gambia and Liberia

PRESENTER: **Rifkatu Nghargbu**, National Institute for Legislative and Democratic Studies, National Assembly, Abuja
AUTHORS: Hauwa Victoria Ibrahim, Doreen Anyamesem Odame

1. **Background** West Africa is one of the regions with the highest number of births in Africa with about 95 million under-five children, this constitutes 14% of under-five population globally (UNICEF, 2023). However, child survival in these regions is one of the lowest compared to other parts of Africa with mortality ratio of 91.5 deaths per 1,000 live births (UNICEF, 2024). One of the leading causes of deaths are fever from malaria and other childhood illnesses which accounts for under-five mortality recorded every minute in Africa (WHO, 2022). Other life threatening illnesses in children include diarrhea, measles and Acute Respiratory Infections (ARI). Despite this, health seeking behavior of mothers seems to be relatively poor and varies across countries in West Africa. The Demographic and Health Survey (DHS) reports shows that children for whom advice or treatment was sought with fever were 60% in Nigeria, 64% in Gambia, 66% in Ghana and 81% in Liberia, respectively. This implies that there are varying factors that are accounting for the differentials across the four West African countries. The objective of this study is to evaluate demand for child health care and examine factors that are accounting for the differentials in child health care seeking behavior in the four selected West African countries. Although, prior studies have provided some evidences on child health care seeking behavior globally, in low-income countries, middle-income countries and sub-Saharan Africa (Mbagaya et al, 2005; Benova et al 2008; Amin et al 2010; Bennett et al 2015; Adedokun and Yaya, 2020; Yaya et al, 2021 and Tebeje et al 2024), there is a study gap for West Africa particularly factors accounting for differentials in the four selected countries. This study seeks to fill this gap. **Methods** The study is theoretically founded on demand model and Andersen health care services utilization behavior model. Data was derived from DHS for the four selected countries particularly the 2018, 2019, 2022 and 2023 waves of the DHS. The demand model for child health care was estimated using the logit regression. **Results** Results shows that socioeconomic factors of mother such as wealth, employment status, residence, education, region and distance to health facilities are common factors that accounts for differences in child health care seeking behavior patterns across the countries which affects demand for child health care as well. **Conclusion** The demand for child healthcare can be improved through conscious efforts in improving the socioeconomic status of the mother. **Keywords**: Child, Healthcare, Demand, Seeking behavior, Logit Regression, West Africa

Ind-492 Primary Care as Substitute or Complement: Evaluating its Impact on Hospital Hierarchies in China

PRESENTER: **Jia Tang**
AUTHORS: Rize Jing, Song Yueping, Chenxu Ni

This study investigates the substitution and complementary effects between outpatient and inpatient services across China's tiered healthcare

system. Leveraging an extensive dataset comprising over 1.5 million patients covering 2013–2019, we provide a nuanced understanding of how primary care utilization impacts higher-tier healthcare services. Employing fixed-effects regression models to account for regional and temporal variations, our analysis offers novel insights into the dynamics of healthcare service utilization. Our findings reveal significant substitution effects, demonstrating that increased primary care utilization reduces reliance on secondary and tertiary hospital services. Specifically, each additional primary care visit decreases the likelihood of secondary hospital visits by 12.7% and tertiary visits by 13.4%, illustrating the pivotal role of primary care in alleviating pressure on higher-level healthcare facilities. This substitution effect is more pronounced for outpatient services, indicating that enhanced primary care effectively absorbs demand traditionally managed at higher-tier hospitals. Such findings highlight the strategic importance of strengthening primary care to optimize resource allocation and reduce healthcare costs, aligning with global trends in health system reforms. Additionally, we identify a complementary relationship between outpatient and inpatient services within the same care level, driven by induced hospitalization. Our data show that each outpatient visit at secondary hospitals increases the likelihood of inpatient admissions at the same facility by 8.9%, reflecting financial incentives in China's healthcare system that encourage unnecessary hospitalizations. This dynamic underscores systemic inefficiencies and calls for policy interventions to mitigate induced demand. Addressing these challenges is crucial for ensuring that primary care functions as a gatekeeper, preventing unnecessary hospital admissions while maintaining quality care. The study also highlights the homogeneity of outpatient services across different hospital levels, which facilitates substitution between these services. Patients increasingly perceive primary and secondary outpatient services as viable alternatives to tertiary care, supporting the efficacy of tiered healthcare reforms. However, disparities in service quality and capacity remain barriers to fully realizing the potential of primary care as a substitute, particularly in rural and under-resourced areas. Policymakers must prioritize investments in primary care infrastructure and workforce development to address these gaps. This research contributes significantly to the literature by offering the first large-scale empirical analysis of healthcare service substitution and complementarity in a developing country context. It provides actionable insights for policymakers seeking to enhance healthcare efficiency through targeted reforms. Our findings advocate for the recalibration of financial incentives to discourage induced hospitalization and promote equitable access to primary care, ensuring that patients receive the appropriate level of care. As China continues to implement its hierarchical medical system, this study serves as a critical resource for designing policies that optimize healthcare delivery and improve patient outcomes. **Key words:** Substitution effects; Complementarity; Tiered healthcare system; Induced hospitalization; Outpatient care; Inpatient care; Healthcare policy; China's healthcare

Ind-1702 Social Learning and Hospital Choice

PRESENTER: **Wenhui Xu**, Shanghai Jiao Tong University
AUTHORS: Cheng Huang, Li Li

Patient mobility is common in countries with unequal regional distribution of medical resources, and it plays a crucial role in ensuring equitable access to care. However, this phenomenon remains understudied. Using unique administrative data, this paper studies the behavior of patients traveling to Shanghai for medical services and investigates the characteristics of its healthcare market. We focus on how social learning influences patients' hospital choices and shapes market structure. Access to reliable information is vital when selecting healthcare providers, particularly in the absence of hospital review platforms and when providers are far from patients' residences. In such cases, social learning becomes a key factor in decision-making. Through estimates derived from discrete choice models, we find that patients' hospital choices are significantly affected by social learning, where neighbors' decisions influence individuals' perceived payoffs. The strength of this effect varies with the demographic similarities between individuals, and the size of the social network has a negligible impact in our sample. Additionally, we highlight Shanghai as a destination with a concentrated healthcare market and explore the relationship between social learning and this market concentration. Our findings provide novel evidence of social learning in the context of patient mobility, shedding light on its role in perpetuating high market concentration in China's hospital sector.

abs-os54 Health Service Costs and Productivity Losses of Australian Children and Adolescents with Attention-Deficit/Hyperactivity Disorder Clinical Symptoms

PRESENTER: **Ha N.D Le**, Deakin University
AUTHORS: Ms. Lisa Gold, David Coghill, Harriet Hiscock

Background: Attention-deficit/hyperactivity disorder (ADHD) is the most common neurodevelopmental disorder. While much is known about the functional and academic impacts of ADHD, the economic impact of ADHD is less well-documented.

Aims: To explore, in children aged 4-19 years, associations between clinically significant ADHD symptoms and (1) government healthcare costs and (2) productivity losses; and (3) factors influencing these costs.

Methods: Data were drawn from the Longitudinal Study of Australian Children (LSAC). Clinically significant ADHD symptoms (e.g. score > 8) were measured using the hyperactivity scale from the Strengths and Difficulties Questionnaire, collected at each time point from 4-17 years. Medicare data (medical and pharmaceutical services) were used to estimate two-year government healthcare costs from 4-19 years. Child school absenteeism was used to estimate caregiver's productivity losses. Multivariable linear models and linear mixed models were used to analyse the associations between healthcare/productivity losses and ADHD symptoms from 4-19 years, adjusting for child and family factors.

Results: Compared to those with no ADHD symptoms, children with ADHD symptoms incurred higher government healthcare costs (mean difference $162, 95% confidence interval $17 to $308 over two-year period) but not productivity losses. Older children, children of Torres Strait Islander origin, or living in outer regional/remote areas were associated with lower government healthcare costs while having internalising/externalising symptoms, autism or other medical conditions or from both Aboriginal and Torres Strait Islander origins were associated with higher healthcare costs. Child age, socioeconomic position, internalising and externalising problems were associated with higher productivity losses while children from two-parent families or English as a second language or from both Aboriginal and Torres Strait Islander origins were associated with lower productivity losses.

Conclusion: ADHD clinical symptoms are associated with higher government healthcare costs. Children living in rural/remote areas may be missing out on clinical care. Children from both Aboriginal and Torres Strait Islander origins had higher healthcare costs and lower productivity losses. Children with externalising or internalising problems had higher healthcare and productivity costs. Targeting supports to at-risk groups

such as children living in remote areas or those with co-morbid health problems, or those from Aboriginal and Torres Strait Islander could improve their health and may lead to positive long-term social, educational and economic outcomes.

8:30 AM –10:00 AM TUESDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Bandung

Economic Burden of Chronic Illness

MODERATOR: **Emmanuel Fulgence Drabo**,

Ind-1482 Health-Related Quality of Life and Productivity Losses Across Cancer Stages: A Prospective Cohort Study to Inform Economic Evaluations in Singapore

PRESENTER: **Sara Tasnim**
AUTHORS: Kennedy Ng, Akshar Saxena, Joanne Ngeow

Background: Cancer imposes substantial economic burden through direct medical costs and indirect costs such as productivity losses. While direct medical costs are well documented, data on productivity losses and health-related quality of life (HRQoL) specific to Singapore's context remain limited. Although studies from the United States and Europe have estimated cancer-related productivity losses and HRQoL impacts, these findings may not translate to Singapore due to differences in cultural values, living standards, labor market conditions, work demands, and retirement age. This contextual variation necessitates local investigation of cancer-related productivity losses and HRQoL. The current knowledge gap hinders accurate economic evaluations from a societal perspective, as Singapore-specific utility values and productivity loss estimates are crucial for informing healthcare resource allocation decisions. This study addresses this gap by providing context-specific data essential for comprehensive economic evaluations of cancer care interventions in Singapore.

Aim: To quantify the impact of cancer on HRQoL and productivity losses across different cancer stages among breast and colorectal cancer patients in Singapore.

Methods: We are conducting a prospective longitudinal cohort study at the National Cancer Centre Singapore. Adult patients (≥21 years) with breast or colorectal cancer who understand English are recruited during their clinical appointments. Data collection occurs at baseline, 3, and 6 months using validated instruments: the EQ-5D-5L for HRQoL and the Work Productivity and Activity Impairment questionnaire (WPAI) for productivity losses. Sociodemographic and clinical characteristics are collected via structured questionnaires. The target sample size is 775 participants per cancer type to ensure sufficient representation across all stages (I-IV) and survivors.

Preliminary Results: Current enrollment includes 307 breast and 166 colorectal cancer patients. Among breast cancer patients, mean EQ-5D-5L index scores show a declining trend with advancing stages (Stage I: 0.881; Stage II: 0.790; Stage III: 0.775; Stage IV: 0.739). Patients undergoing treatment report lower HRQoL (0.774) compared to survivors (0.800). Post-diagnosis, 70.92% took time off work, with 32.37% opting for early retirement. Work productivity loss was substantial during treatment, particularly in Stage II (72.1%) and Stage III (77.4%) patients. Employment status changed significantly post-diagnosis, with many patients adapting work arrangements (27.03%) or leaving the workforce entirely.

Conclusions: This ongoing study will provide the first comprehensive assessment of cancer's impact on productivity and HRQoL in Singapore's context. Preliminary findings suggest substantial productivity losses and decreased quality of life, particularly during treatment phases. These results will enable more accurate economic evaluations from a societal perspective and inform evidence-based policies for workplace support programs. The study's longitudinal design will also provide insights into the temporal patterns of these impacts, supporting better resource allocation and intervention timing in cancer care.

Ind-1726 Severity of Visual Impairment and Economic Well-being of Older Adults in India

PRESENTER: **Rajeev Ranjan Singh**

Background: Visual impairment (VI) is a major public health challenge among older adults, often exacerbating economic disparities and reducing quality of life. This study examines the association between the severity of VI and economic well-being among older adults in India, focusing on the role of socio-demographic and health factors in mediating these relationships. Understanding how VI affects household economic status and how socio-economic and health characteristics influence vision outcomes is essential for addressing inequities in ageing populations. **Data and Methods:** The analysis utilises data from the nationally representative survey. Longitudinal Ageing Study in India (LASI): The dataset includes information (biomarkers) on vision health, socio-economic status, and health indicators for adults aged 45 and above. Vision impairment is categorised by severity (distance, near, and overall), and a composite economic well-being index is constructed using monthly per capita expenditure (MPCE), monthly per capita income (MPCI), and the wealth index. Bivariate analyses explore the prevalence of VI by socio-demographic factors, while regression models assess the impact of VI severity on economic well-being, adjusting for key variables such as age, education, gender, living arrangements, and health status. **Results:** Findings reveal that VI is strongly age-dependent, with adults aged 75+ experiencing the highest rates of moderate and severe impairments. Economic well-being emerged as a protective factor, with individuals classified as "living comfortably" or with higher education levels reporting better visual health. Conversely, severe VI is significantly more prevalent among individuals in lower wealth quintiles and those with limited education. Gender disparities were also evident: women reported slightly higher levels of VI across all severity gradients compared to men. Marital status and place of residence played a significant role; married individuals and urban residents generally had better vision health, while widowed individuals and rural residents faced

heightened vulnerability. Visual impairment was found to have a profound negative impact on household income. Severe VI was associated with substantially lower composite economic well-being scores, underscoring the dual burden of health and financial challenges faced by affected individuals. Regression analysis highlighted the protective role of health insurance, positive self-rated health, and urban residence in mitigating the adverse effects of VI. In contrast, factors such as tobacco use, comorbidities, and lower educational attainment exacerbated vulnerability, creating compounded disadvantages for the affected population. **Conclusion:** The study underscores the significant bidirectional relationship between VI severity and economic well-being among older adults in India. Socioeconomic inequalities amplify the impact of VI, disproportionately affecting women, rural residents, and individuals with lower education and economic status. These findings highlight the urgent need for integrated policies addressing vision care, economic support, and social inequities. Promoting education, ensuring equitable access to healthcare, and providing targeted support to vulnerable groups can help alleviate the dual challenges of visual impairment and economic disadvantage. Addressing these disparities is critical to enhancing the well-being and productivity of India's ageing population.

Ind-1985 The Economic Burden of Asthma on Children, Adolescents and Households in sub-Saharan Africa: CHEST-Africa data

PRESENTER: **Nqobile Ndimande**
AUTHORS: Refiloe Masekela, Sandra Kwarteng-Owusu, Tony Kayembe-Kitenge, Kevin Mortimer, Rebecca Nantanda, Josue Mbonigaba, Jibril Mohammed

Background

Asthma remains the most common chronic respiratory disease among children globally, with sub-Saharan Africa having a disproportionately higher prevalence. In addition to the health burden, there is a considerable economic burden. This is evidenced by direct costs for accessing healthcare services for diagnosis and ongoing treatment. There are also indirect costs including school absenteeism consequently missing key foundational lessons, and lost income by caregivers. The UN Sustainable Development Goal (SDG) 3.8 aims for all people to have access to health services without suffering financial hardship. Data in sub-Saharan Africa quantifying the economic burden of asthma is lacking. The aim of this study was therefore to determine the economic burden of asthma in children and adolescents in 4 sub-Saharan African countries.

Methods

Data was collected cross-sectionally using questionnaires adapted from the Global Asthma Network in four sub-Saharan African countries that are part of the Chronic Respiratory Disease Observatory for Africa (CHEST-Africa) study, Democratic Republic of Congo, Ghana, Nigeria, and Uganda. Data was collected from school children in two groups, children (6-7 years) and adolescents (13-14 years). Random sampling was used to select participants and health economic data was collected from the parents/relatives of participants who screened positive for asthma. Data included sources of household income, expenditure on asthma treatment, insurance coverage, and absenteeism. As an indicator of financial hardship, we used catastrophic health expenditure which occurs when household out-of-pocket health spending is more than 10% of household income as defined by the WHO.

Results

4,495 children and adolescents from the 4 countries participated in the main CHEST-Africa study. Of those, 223 (5%) screened positive for asthma and completed the health economic questionnaire. At the WHO 10% threshold, 35% (78/223) of households experienced catastrophic health expenditure. Twenty-five percent of households did not have an employed person in the home and 27% of households relied on support from extended family. A significant proportion (16%) had recently borrowed money to fund asthma treatment costs and 4% did not buy any medication due to unaffordability. Almost a third (30%) had medical insurance but only 17% of those stated that their insurance covered all treatment costs. Over a third (35%) of participants missed at least one day of school within the previous six months due to their asthma.

Conclusion

The costs to access asthma treatment for children and adolescents in sub-Saharan Africa are substantial, and catastrophic for a significant number of households. The indirect cost to people living with asthma are also significant. These findings provide evidence supporting the need for more universal health coverage for non-communicable diseases like asthma which includes all related healthcare costs.

Ind-2585 Provincial Analysis of Years of Life Lost and Economic Impact of Heart Disease Among the Working-Age Population in Indonesia (2018-2023)

PRESENTER: **Mitha Cerinda**
AUTHORS: Yenny Yenny, Susi Ari Kristina, Fentya Yumna Cahyani, Mr. Benjamin Saut Parulian Simanjuntak, Mr. Mahlil Ruby, Rizal Mansur, Mr. Antokalina Sari Verdiana

Background: Heart disease remains the leading cause of premature mortality in Indonesia, significantly impacting the population's health and the country's economy. In 2023, BPJS Kesehatan allocated IDR 17.63 trillion to cover heart disease treatment, making it the most expensive disease among those covered, with 20.04 million cases reported throughout the year. This study aims to quantify the burden of heart disease through the calculation of Years of Life Lost (YLL) and productivity costs. By providing a comprehensive analysis of the health and economic impact, this research highlights the urgent need for effective prevention and management strategies to address the growing burden of heart disease in Indonesia. **Methodology:** This study utilized mortality data from BPJS Kesehatan over the period of 2018 to 2023, involving 218,279 individuals. Heart disease-related deaths were identified using specific diagnostic codes. Years of Life Lost (YLL) were calculated following the Burden of Disease study framework, with WHO life expectancy tables used to estimate the years of life lost for each individual. The analysis was conducted at both national and provincial levels, focusing on the working-age population (15–64 years). Economic losses were assessed by linking YLL data for the working-age population to annual provincial minimum wages. A gender-based analysis was also

performed to identify differences in economic impacts between males and females. **Results:** This study found significant variations in productivity losses due to heart disease across provinces in Indonesia, with Central Java experiencing the highest total productivity loss of IDR 9.39 trillion, followed by East Java with IDR 9.20 trillion. Despite having lower annual provincial minimum wages of IDR 23.5 million and IDR 24.4 million, respectively these two provinces faced the largest economic burdens, highlighting the disproportionate impact of heart disease on regions with lower income levels. In contrast, Jakarta, with the highest annual provincial minimum wages of IDR 58.8 million, reported a smaller total loss of IDR 7.92 trillion, despite a considerable number of YLL. Gender-based analysis revealed that males consistently accounted for a larger proportion of productivity losses across all provinces, contributing 65% of the total loss compared to 35% by females. These findings underscore the significant economic burden of heart disease and its unequal impact across provinces and gender groups, emphasizing the need for targeted prevention and intervention strategies. **Conclusion:** Significant differences in productivity losses due to YLL across provinces and between genders highlight the need for targeted health interventions to reduce YLL from heart disease, particularly within the working-age population. Tailored strategies, including early detection, improved healthcare access, and public health campaigns, are essential to address these disparities and mitigate the economic impacts of premature mortality. These findings provide a foundation for policymakers to design equitable and sustainable public health programs.

8:30 AM –10:00 AM TUESDAY [Health Beyond The Health System]

Bali International Convention Centre – Executive Room 1

Health in the Third Age

MODERATOR: **Cydney M McGuire**,

Ind-177 Social Capital, Cognition, and Mental Health Among Older People in China: A Longitudinal Life Course Study

PRESENTER: **Chengxu Long**, King's College London
AUTHORS: Wei Yang, Karen Glaser

Research suggests that stronger social support systems across life stages facilitate continuous learning and emotional well-being, contributing to better cognition and mental health. However, evidence on the cumulative effect of social support over the life course remains scarce, and even less is known about the impact of broader neighborhood-level social support on individuals' cognition—a crucial dimension in many countries, where neighborhoods serve as key support units for individuals. Using data from 2014, 2015, 2018, and 2020 waves of the China Health and Retirement Longitudinal Study, we employed mediation analysis to explore how individual and neighborhood social support accumulated across life stages are associated with cognition and depression at older ages. Our findings indicate that receiving individual support in youth was associated with a 0.5-point improvement in later-life cognitive scores, although no direct association was observed with depression. In addition, a one-point increase in the neighborhood support score was associated with a 1.2-point improvement in cognitive scores and 0.5 fewer depressive symptoms at older ages. These associations persist among individuals who were socioeconomically disadvantaged in their youth. Furthermore, both individual and neighborhood support in youth exert indirect effects on later-life cognition and depression by helping individuals maintain social support as they age. Our findings contribute theoretical insights into the importance of social support across life stages and highlight the stronger role of neighborhood support in shaping cognition and depression. Strengthening neighborhood social support and fostering lifelong supportive environments may help mitigate disadvantages in earlier life stages and reduce health disparities.

Ind-400 China's Supplementary High-cost Social Health Insurance's Impact on Old Age Poverty: A Nationwide Population-based Study

PRESENTER: **Shiju Dong**, Centre for Health Management and Policy Research, School of Public Health, Cheeloo College of Medicine, Shandong University, Jinan, 250012, China
AUTHORS: Siqian Zhang, Jiajia Li

Summary

Background: In 2012, China initiated supplementary high-cost illness insurance (SHCII) to provide supplementary compensation beyond social health insurance (SHI) coverage for high-cost patients. This study aimed to assess whether the SHCII could mitigate the poverty risk among older adults, a crucial subset of high-cost patients.

Methods: This study developed an old-age-specific poverty measure that combines monetary and non-monetary approaches. Using data from the China Health and Retirement Longitudinal Study (CHARLS: 2011, 2013, 2015, and 2018), we estimated the old age poverty incidence and its dynamic trends. A multinomial logistic regression with a staggered difference-in-difference approach was employed to explore how the SHCII affects older adults, particularly its impact across gender, urban/rural areas, hospitalisation experience, and health status.

Findings: The analysis revealed a gradual decrease in poverty, a slight improvement in the precarious group, and a significant rise in the prosperity group. Compared to the prosperity group, SHCII significantly reduced the likelihood of precariousness (Relative Risk= 0·642, 95% Confidence Interval 0·465-0·887) and poverty (Relative Risk=0·439, 95% Confidence Interval 0·278-0·694), which was more pronounced among women, urban elderly, those who reported good self-rated health, and those who did not undergo hospitalisation.

Interpretation: Despite the great advances towards poverty alleviation among older adults in China, 27·83% faced at least one deprivation in terms of housing, healthcare, pension, and financial security in 2018, but failed to be identified by monetary poverty. Social health insurance reforms must emphasise identifying and managing poverty risk by targeting older adults using a hybrid approach that integrates monetary and non-monetary poverty identification.

Keywords: supplementary high-cost illness insurance, old age poverty, monetary and non-monetary poverty, older adults, China

Ind-939 Intrinsic Capacity in 15 Countries in the Survey of Health, Ageing, and Retirement in Europe: Validation, Variations, and Population Centile Curves

PRESENTER: **Meimei Chen**
AUTHORS: John Beard, Katja Hanewald, Yafei Si, Yuanyuan Gu

Background The world is experiencing a demographic shift with an increasing percentage of older adults in almost every population. In 2015, the World Health Organization released its first world report on ageing and health, which proposed a framework for healthy ageing focused on the development and preservation of older adults' functional ability. An individual's functional ability is defined as the result of the individual's Intrinsic Capacity (IC), their environment, and the interactions between the two. Previous studies have validated the concept of IC and its structure across various settings. However, these are still largely limited to single country scenarios; no study has yet validated the IC construct and predictive validity of this structure using a cross-national dataset.

Objective In this study, we aim to determine and validate the structure of IC using data from the Survey of Health, Ageing, and Retirement in Europe (SHARE), which includes participants from 15 countries. We first examine the structure and validity of the IC construct, and then conduct a cross-national comparison of IC and subdomain scores, stratified by age, gender, country, and socio-economic status. Finally, we derive population centile curves for IC and its subdomains, stratified by gender and country.

Methods We analysed data from 64,872 participants from SHARE Wave 5 (2013) and determined subsequent care dependence in Wave 6 (2015). The methodologies employed included Exploratory Structural Equation Modelling (ESEM), bifactor ESEM, Confirmatory Factor Analysis (CFA), bifactor CFA, and mediation analysis. Construct validity was tested through multiple linear regression, while predictive validity was assessed using mediation analysis. We use Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) as outcome variables to determine declining performances of older adults in the following wave, since it provides a comprehensive measure of severe disability and loss of independence that is of clinical relevance and different from the items selected to construct IC. Population centile curves were established using the GAMLSS method.

Findings Our analyses revealed IC's structure as one general factor and five subdomains: psychological, sensory, cognitive, locomotor, and vitality. Regression linked IC to age, gender, education, multimorbidity, and socio-economic status. Mediation analysis indicated that IC predicts subsequent declining performance in daily activities. We observed significant variations in IC scores between genders and across countries, allowing us to construct centile curves for IC by gender and country. Generally, men scored higher in IC and all subdomains than females, except for cognitive. Lower socio-economic status was correlated with lower scores in both males and females. Population centile curves show a declining trend of IC and subdomain scores across and within countries for both males and females.

Interpretation IC is a valid, reliable measure that effectively captures individual-level aspects of the functional ability of older adults. The centile curves we have developed show that IC has the potential to serve as a benchmark for health status in older populations.

Ind-2326 Financial Symptoms of Dementia Among Singles and Coupled Households

PRESENTER: **Lauren Hersch Nicholas**, University of Colorado

About 14.7 percent of American adults over the age of 70 have Alzheimer's Disease and Related Dementias (ADRD), neurodegenerative conditions characterized by deteriorating cognitive function that impedes daily life through deficits in memory and other cognitive domains. Common ADRD symptoms, including memory problems and decreased attention and judgment, frequently impair one's ability to manage personal finances. Erratic bill payments, risky financial decisions, and fraud susceptibility are widely recognized as early warning signs of ADRD, though families and physicians often do not detect these behaviors until late in the course of the disease. Despite limited research regarding the full extent of dementia-related losses, the lay press has described numerous anecdotes of loved ones first learning of a patient's decline through catastrophic financial events including foreclosure and asset depletion.

In this paper, we use more than two decades of linked Medicare claims and credit report data for over 2 million older Americans to study dementia-linked adverse financial events, building on our earlier work. We estimate flexible, non-parametric linear probability models that regress credit data events on a series of time from dementia indicators, relative to a never-dementia control group. We separately model single person and coupled households, since a spouse may be able to prevent financial problems by observing deteriorating cognition and/or directly receiving communication about missed payments. We find that dementia-linked financial problems begin to emerge more than a decade prior to clinical recognition. Both single and coupled households are impacted, however singles are twice as likely to experience events such as missed bill payments (i.e. 5 percentage points more likely 2.5 years post-diagnosis vs. 3pp) and subprime credit scores (indicating low probability of repaying a loan if one is extended). Coupleness appears protective against some of the most serious financial catastrophes. While single households develop elevated risk of derogatory mortgages, a pathway to home foreclosure, 4 years before other symptoms of dementia, couples never face elevated risks.

Results highlight the need for assistance with money management for single households with dementia and underscore the need for early detection efforts to protect financial well-being.

Ind-1081 The Impact of Retiring on Suicide: Evidence from South Korea

PRESENTER: **Elcin Tuzel**
AUTHORS: Dain Jung, Kam Ki Tang, Do Won Kwak

Abstract Suicide is a global problem, and older adults are particularly vulnerable. Understanding what contributes to and mitigates suicide risk is critical, especially during major life transitions such as retirement. Evidence on the impact of retirement on mental health is mixed. Against this background, we aim to examine the effect of retirement on suicidal ideation and the role that life satisfaction and social networks may play. In addition, we consider whether retirement also affects inter-partner relationships by considering the effect of retirement on intimate partner violence. We use longitudinal data from the Korea Welfare Panel Study. Our sample consists of 22,474 observations for 2,683 individuals aged 50 or older from 2006-2023. To address the issue that retirement may be endogenous to mental health, life satisfaction, and social networks, we use pension eligibility as an instrumental variable (IV). We also use the event study approach for robustness checks. For the modifiers, we consider individuals' satisfaction with social and family relationships before retirement. Our analysis indicates that retirement has no significant effect on suicidal ideation or attempts. However, we find that when husbands retire, their emotional abuse toward their wives falls by 0.8 SD, and wives' emotional abuse toward their husbands declines by 0.7 SD. Moreover, men who exhibited poorer mental health before retiring reduce all forms of intimate partner violence after retirement. Together, these results suggest that mental health and job satisfaction are important mechanisms shaping how major life transitions—like retirement—affect patterns of intimate partner violence.

Mimimising Harms from Alcohol Consumption

MODERATOR: **Jaithri Ananthapavan**, Deakin University

Ind-2300 Economic Evaluation of Later Trading Hour Policies for Bars and Clubs Alongside a Natural Experiment in Aberdeen and Glasgow, Scotland

PRESENTER: **Nurnabi Sheikh**
AUTHORS: Emma McIntosh, Jim Lewsey, Colin Angus, Niamh Fitzgerald

Introduction

On-trade alcohol premises, such as bars, pubs, and restaurants, a significant part of the night-time economy, serving as key places for socialization, entertainment, and cultural events. However, later trading hours for bars and clubs can also be associated with adverse public health outcomes, including higher rates of alcohol consumption, intoxication, assault, and injury. Later trading hours also place increased demands on public services including ambulance, hospital admissions, and police services. The present study aims to conduct an economic evaluation of later trading hours policies for bars and clubs in Scotland.

Methods

An economic evaluation alongside a natural experiment was conducted as part of the ELEPHANT study in Glasgow and Aberdeen. Traditional economic evaluation frameworks were employed, including cost-effectiveness analysis (CEA) and cost-consequence analysis (CCA) for the purposes of transparency of resource and outcome flows. The policy itself was not a typical public health 'intervention' generating expected health improvements as such but rather a policy with unknown impacts. The CEA focused on the primary outcome of alcohol-related ambulance call-outs with 'effectiveness' referring to reductions in alcohol-related ambulance call-outs. The CCA considered both primary and secondary outcomes including all ambulance call-outs and reported crimes. Analysis was conducted from a societal perspective, including impacts to the health sector, criminal justice system, business sector, and third-sector organizations. A range of deterministic sensitivity analyses were performed to test the robustness of the findings. The timeframe for analysis covered the period from 2015 to 2022, with a 1.5% discount rate applied in line with the NICE public health guidelines, and a 3% rate used for sensitivity analyses.

Results

No statistically significant effects of the policy of later trading hours for bars and clubs were observed in Glasgow. For Aberdeen, the base case CEA for the policy of later trading hours was deemed to be less 'effective' due to increased alcohol-related ambulance call-outs and also more costly. The policy change resulted in higher costs than before the policy change. The policy change resulted in an increase of 1,900 alcohol-related ambulance call-outs, alongside an estimated £4.5 million in additional costs during the study period. From a societal perspective, the additional costs attributable to this policy change were estimated to be £6.3 million. The increased costs included £0.94 million to the health sector, £0.78 million to the criminal system, £4.5 million to the business sector, and £94,256 to the third sector. In alternative scenarios, the total societal costs ranged between £7.2 million and £7.6 million.

Conclusions

The later trading hours policy for bars and clubs in Aberdeen was associated with increased alcohol-related ambulance call-outs and overall increased costs to society across multiple sectors, including health, crime justice, and the third sector. These findings were not observed in Glasgow. Although the policy change may offer benefits from a retailer perspective (not estimated in this study due to data limitations), the additional costs being incurred across multiple sectors for some cities should be carefully considered to inform future decisions and legislation on alcohol trading hours locally, nationally, and internationally.

Ind-1629 Economic Evaluation of a Policy to Restrict Density of Licensed Premises

PRESENTER: **Mary Rose Angeles**, Deakin University

AUTHORS: Mishel Shahid, Mr. Lennert Veerman, Amila Suranga Malawige, Leopold Aminde, Mary Wanjau, Moosa Al Subhi, Linda Cobiac, Phuong Nguyen, Ms. Jaithri Ananthapavan

Introduction: Restricting liquor outlet density is an intervention to reduce alcohol availability, potentially influencing alcohol consumption and related harms. The cost-effectiveness has not been examined. This study evaluates the cost-effectiveness of restricting outlet density in two of the most populous metropolitan areas in Australia.

Methods: We conducted an economic evaluation of the implementation of a hypothetical policy to keep the number of liquor licenses approved at 2019 levels, and therefore restricting additional alcohol outlets in Greater Sydney and Metropolitan Melbourne, compared to a status quo (current practice) scenario. This analysis focuses on individuals aged 15 and older in metropolitan areas and adopts a limited societal perspective considering costs and benefits to individuals, governments and the private sector. Productivity impacts were not included. Intervention effectiveness was estimated by comparing the impact of changes in alcohol outlet density on alcohol consumption for the affected population 15-years and older over 20-years. An Australian study reported that each additional liquor license within a 1.6km neighbourhood is associated with an additional 0.15 grams of alcohol consumed per person daily (p=0.002). The current number of liquor licenses together with evidence that 82% of the target population live within 1.6km of any alcohol outlet was used to estimate the potential number of people who would be exposed to a new liquor licenced venue. The projected increase in the number of liquor licences over the 20-year period was informed by regression analysis based on the increase in liquor licences from 2010-2022. The cost of policy development, stakeholder consultation and profit losses to the industry resulting from not issuing additional liquor licenses were calculated based on the best evidence in the literature. All costs and benefits are discounted at 5% and costs are presented in 2020 Australian dollars. The Alcohol Policy (TAP) model, a proportional multistate lifetable Markov model, simulated the policy's impact in health-adjusted life years (HALYs) and healthcare cost savings from reduced alcohol-related diseases and injuries. These outcomes, combined with intervention costs, estimated the policy's cost-effectiveness. Parameter uncertainties were modelled using Monte-Carlo simulation with 2,000 iterations. Scenario analyses were conducted to test the robustness of the results.

Results: Over 20 years, the projected average reduction in population alcohol consumption was 0.21% (95%UI: 0.06, 0.34) for Greater Sydney and 0.13% (95%UI: 0.05, 0.21) for Metropolitan Melbourne. The intervention cost AUD$17.28 million (95%UI: 5.37, 28.72) in Greater Sydney and AUD$9.68 million (95%UI: 3.85, 16.16) in Metropolitan Melbourne. The modelled intervention generated HALYs of 2,040 (95%UI: 665, 3520) in Greater Sydney and 1,010 (95%UI: 364, 1690) in Metropolitan Melbourne. The mean the Incremental Cost-Effectiveness Ratios (ICERs) were below the A$50,000 per HALY threshold: 791 (95%UI: Dominant, 17,300) for Greater Sydney and 1,840 (95%UI: Dominant, 17,800) for Metropolitan Melbourne. In Greater Sydney and Metropolitan Melbourne, 41% of iterations were cost-effective, with 28% being dominant. Across all scenarios tested, there is a 99% probability that the intervention is cost-effective.

Conclusion: Results suggest that a policy restricting liquor outlet density in Australia's two most populous metropolitan areas is a cost-effective strategy. Governments should consider and strengthen policies on licensing approvals.

Ind-2067 Alcohol Use Disorder Treatments for Achieving Abstinence: A Model-Based Cost-Effectiveness Analysis

PRESENTER: **Mr. Anton Avanceña**, The University of Texas at Austin

AUTHORS: Tiffany Kuo, Divya Parameshwar, Madeline Brendle

Alcohol use disorder (AUD) is the most common substance use disorder in the US, affecting 28.9 million (10.2%) individuals aged ≥12 years in 2023. Several pharmacological and non-pharmacological AUD treatments can help individuals with AUD achieve abstinence—one of many goals in recovery—with varying levels of effectiveness and costs. This economic evaluation assessed the costs, health effects, and cost-effectiveness of AUD treatments that promote abstinence. We developed and validated a decision-analytic microsimulation model of individuals with AUD. The model includes six health states: abstinence, four World Health Organization risk drinking levels (low-risk, medium-risk, high-risk, and very high-risk drinking), and death. We parameterized the model using previously published transition probabilities for AUD by sex, age, race, and ethnicity in the US. We compared nine AUD treatments, including four Food and Drug Administration (FDA)-approved pharmacotherapies (oral and injectable naltrexone, disulfiram, and acamprosate), three non-FDA-approved, guideline-recommended pharmacotherapies (gabapentin, baclofen, and topiramate), and two non-pharmacological treatments (psychotherapy and mutual help programs). The effectiveness of each treatment was based on previous meta-analyses or clinical trial data. The model estimated each treatment's costs (2023 US$) from a healthcare payer perspective and health outcomes (in terms of quality-adjusted life years [QALYs]) over a five-year horizon. We assessed cost-effectiveness using incremental cost-effectiveness ratios and net monetary benefits (NMBs) assuming a cost-effectiveness threshold of $150,000 per QALY gained. In the base-case analysis, we assumed that individuals would only be treated once in five years, though we allowed up to five retreatments with the same therapy in scenario analyses. We also conducted deterministic and probabilistic sensitivity analyses to understand the impact of parameter uncertainty on our findings. Our preliminary results found that single treatments of disulfiram, baclofen, and psychotherapy were the cost-effective options when compared to treatments within their respective categories (FDA-approved, non-FDA-approved, and non-pharmacological treatments, respectively). Comparing all treatments, baclofen was associated with the greatest health effects (2.893 QALYs) and the lowest costs ($6,747), thereby dominating all other AUD treatments. Baclofen had the highest NMB even as the number of possible retreatments was increased to five over five years. Probabilistic sensitivity analyses found that disulfiram and baclofen were <50% likely to have the highest NMB at a cost-effectiveness threshold of $150,000 per QALY gained or higher. This economic evaluation suggests that pharmacotherapies, particularly baclofen, are the most cost-effective treatments to promote abstinence among individuals with AUD. Treatment guidelines for AUD can incorporate these findings in their recommendations. Additional research is needed to measure the short- and long-term health-related quality of life associated with different risk drinking levels among people with AUD.

Ind-1723 An Economic Evaluation of Naltrexone and Acamprosate Versus Disulfiram and Psychosocial Therapy Alone in Treating Alcohol use Disorder in Thailand

PRESENTER: **Manit Sittimart**

Background: Alcohol use disorder (AUD) is one of the significant public health concerns in Thailand, contributing to a wide range of social and health issues, including increased rates of liver disease, mental health disorders, accidents, and violence. The National Health Security Office (NHSO) reports that a substantial portion of the population engages in heavy drinking, with a growing need for effective treatment options. Naltrexone and acamprosate, both shown to reduce alcohol craving and prevent relapses, represent promising treatment options that could address the growing burden of AUD and improve patient outcomes. However, there was limited evidence on cost-effectiveness of such treatment in the Thai context. **Objective:** This study aimed to assess the cost-effectiveness of naltrexone and acamprosate, when combined with psychosocial therapy, for the treatment of AUD, in comparison to disulfiram with psychosocial therapy and psychosocial therapy alone. **Method:** A cost-utility analysis was conducted using a Markov model and followed the Thai health technology assessment (HTA) guidelines.* *The target population in the model was patients with moderate to severe alcohol use disorder, as defined by the American Psychiatric Association. The analysis used a societal perspective and a lifetime time horizon with 3% discount rate for both costs and outcomes. Parameters used in the model were derived from published literature and existing databases. Results were presented as an incremental cost-effectiveness ratio (ICER). The Thai willingness-to-pay threshold at 160,000 Thai Baht (THB)/quality-adjusted life year (QALY) was used to determine cost-effectiveness. Sensitivity analyses, including one-way and probabilistic analyses with Monte Carlo simulations (1,000 iterations), were performed to explore influential parameters and uncertainty.* ***Results:*** *The deterministic analysis indicated that acamprosate, with an ICER of 12,348 THB/QALY, was more cost-effective compared to Naltrexone, which had an ICER of 148,203 THB per QALY. Disulfiram was deemed dominated by psychosocial therapy alone. The probabilistic sensitivity analysis indicated that acamprosate had an 87% probability of being cost-effective at Thailand's threshold, while naltrexone had a 5% probability. One-Way sensitivity analysis revealed that the efficacy of acamprosate was among the most influential parameters on the ICER.* ***Conclusion:*** *This study** suggested that acamprosate when combined with psychosocial therapy is the most cost-effective treatment for AUD in Thailand, especially as the willingness-to-pay threshold increases. This study highlighted the potential for acamprosate as a preferred treatment option in the Thai healthcare context.

8:30 AM –10:00 AM TUESDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Denpasar B

Medical Prescriptions and Adherence

MODERATOR: **Joanne Spetz**,

Ind-1153 Diagnostic Uncertainty and Prescription Practices Among Pharmacists

PRESENTER: **Maximilian Guigas**

AUTHORS: Matthias Rieger, Edward Asiedu, Jan Priebe, Christoph Strupat

Antimicrobial resistance (AMR) is a growing global health concern, causing an estimated 1,27 million deaths in 2019 (Murray et al., 2022). Worldwide Sub-Saharan Africa is the region with the highest number of deaths per 100,000 inhabitants associated with AMR worldwide (Naghavi et al., 2024). To combat this AMR Stewardship programs aimed at health care professionals, especially primary care physicians, received broad attention. However, in Ghana, pharmacists often serve as frontline healthcare providers. In addition, widespread “over-the-counter” sales of antibiotics threaten the sustained efficacy of antimicrobial drugs. This study aims to shed light on how AMR-related knowledge and diagnostic uncertainty influence the antibiotic prescription behaviors of formal and informal pharmacists. Furthermore, the role of economic preferences (e.g. risk aversion, reputational concerns) and personality (altruism, social desirability) in their dispensing behavior shall be evaluated. To the best of our knowledge there are not yet any noteworthy impact studies on antimicrobial dispensing behavior of pharmacists. Hence, we conducted a survey of 480 pharmacies and over-the-counter medical vendors (240 each) in 60 randomly selected neighborhoods in the Greater Accra Region, Ghana. The interview with one sales employee of each facility comprised questions on antibiotic knowledge, dispensing practices and personality measures. It further included four standardized vignettes that aimed to vary patients’ symptoms to signal more/less clear underlying medical conditions to measure individuals’ diagnostic uncertainty. To additionally obtain more objective data on the actual dispensing behavior, an audit (mystery shopper/simulated patient) study was conducted after completion of all surveys. Each facility was visited four times by different actors making up a total of 1920 audit visits. Hereby, the displayed cases varied on five dimensions. Firstly, regarding the presented disease (medication was requested for someone else), secondly the duration of the symptoms, thirdly the intensity with which an antibiotic was demanded, fourthly the subjective wealth of the actor and lastly the location, where they intended to buy the medication. Primary outcomes include the binary decision to prescribe antibiotics and the quality of associated advice. Hypotheses concerning risk aversion, altruism, social desirability, reputational concerns, and AMR knowledge are tested using descriptive statistics and multivariate regression, particularly ordinary least squares (OLS). Initial findings demonstrated a significant relationship between higher AMR knowledge and a reduction in unnecessary antibiotic prescriptions, however this could not be supported by the evidence from the audit study. Pharmacists with greater risk aversion were less likely to dispense antibiotics, particularly when faced with diagnostic uncertainty. Furthermore, social desirability and altruism influenced the likelihood of antibiotic dispensing. The insights from this study suggest important policy implications, advocating for enhanced educational initiatives aimed at improving AMR awareness among pharmacists, thus promoting responsible antibiotic use. Policymakers are encouraged to implement support systems that aid pharmacists in navigating diagnostic uncertainties, thereby strengthening the integrity of pharmaceutical care and combating AMR. Murray, Christopher JL, et al. "Global burden of bacterial antimicrobial resistance in 2019: a systematic analysis." *The lancet* 399.10325 (2022): 629-655. Naghavi, Mohsen, et al. "Global burden of bacterial antimicrobial resistance 1990–2021: a systematic analysis with forecasts to 2050." *The Lancet* 404.10459 (2024): 1199-1226.

Ind-2127 Estimating Physicians' Reimbursement Elasticity for Antibiotic Care Tests Using Discrete Choice Experiments

PRESENTER: **Madison Luick**
AUTHORS: Koen Pouwels, John Buckell

Overuse of antibiotics for respiratory tract infections (RTIs) contributes to antimicrobial resistance (AMR). Point-of-care tests (POCTs) for C-reactive protein (CRP) have been shown to reduce unnecessary prescribing in primary care and are widely used in countries that have comparatively low antibiotic prescribing rates. However, CRP POCTs are rarely used in UK general practices, potentially partly explaining why antibiotic use in UK primary care is higher than in several other European countries. While several EU countries reimburse GP practices for the use of CRP tests, the lack of funding and reimbursement for CRP tests have been identified as barriers to uptake. Introducing a reimbursement scheme in the UK could be a beneficial strategy to incentivise the appropriate use of CRP tests. However, more research needs to be done to better understand what reimbursement strategy would encourage appropriate usage. For example, in Denmark there is evidence that the reimbursement strategy – with reimbursement levels being more than double the amount used in the Netherlands - might have led to overuse of CRP tests among patients in which a CRP test is neither indicated nor validated.

This study evaluated reimbursement levels that could lead to the highest appropriate uptake of CRP tests in UK primary care.

A sample of 511 general practitioners (GPs) in the UK completed an online discrete choice experiment (DCE). The DCE tested the effect(s) of reimbursement levels on administering CRP tests. Five attributes were: patient symptoms, patient pressure for antibiotics, requirements for reimbursement, cost of the test being covered, and any additional reimbursement incentive per test (range: £0-5). Following the DCE, participants were asked questions about their knowledge of AMR and whether they were considering AMR when making their decisions in the choice task. A Bayesian, D-efficient design was used, excluding any combinations considered implausible by clinicians on our study team. The choice between using a CRP test or not was assessed using multinomial logit models with reimbursement level as a categorical predictor.

Current analyses suggest that, when the cost of tests is not covered and there is no reimbursement, GPs prefer not to use a CRP test. Covering the cost of the test and increasing the reimbursement incentive value of the test relative to no reimbursement generally increased the preference for using a CRP test. When modelling reimbursement as a categorical variable, results suggest that a £1 incentive does not meaningfully increase preferences relative to a £0 incentive, and that there may be diminishing returns on increasing the incentive amount after £4. Preferences for using a CRP test also varied by requirements for reimbursement, patient symptoms, and patient expectation for antibiotics.

Preliminary results from this stated choice survey indicate that covering the cost of CRP tests and offering a reimbursement incentive for using them may improve the uptake of CRP tests in UK primary care settings.

Ind-2768 A Comprehensive Study on Healthcare Services and Medication Affordability and Availability Amidst Economic Challenges in Mount Lebanon Governorate

PRESENTER: **Mira Al Aridi**

Background Due to the economic crisis, the COVID-19 pandemic, and the port explosion in Beirut, Lebanon has been plagued by a multidimensional crisis that has affected numerous facets of the country's healthcare system. However, limited studies have examined the effects of the crisis on the accessibility and affordability of healthcare services and medications, specifically in the Mount Lebanon governorate, the most populous governorate in Lebanon comprising both urban and rural regions. Therefore, this study aims to highlight the impact of the economic crisis on healthcare services and medication availability and affordability among different socio-demographic groups in Mount Lebanon. **Methods** The study employed a cross-sectional design and was conducted from January 1 to February 19, 2024. An online survey was conducted to collect data on the sociodemographic characteristics, healthcare-related experiences, and medicine-related experiences of 125 residents of Mount Lebanon. The survey employed a set of suggested questions established by the OECD along with other questions which were developed by the researcher. Descriptive statistics and chi-square tests between socio-demographic subgroups were conducted using SPSS version 29. **Results** Among participants who have experienced medical issues in the past 12 months, 26.5% reported not visiting a healthcare provider due to travel difficulties, 42.2% reported the same problem but due to cost considerations and 45.1% reported that they have skipped a medical test, treatment or follow up due to its cost. In fact, the highest percentages of inaccessibility to healthcare were found among females, elderly, individuals with no or low levels of education, individuals of average to low income groups, and people suffering from chronic diseases or poor health status. Moreover, 58.4% of respondents reported experiencing problems getting their prescribed medicine at the pharmacy, such as it not being available or out of stock. However, no significant differences were found between subgroups concerning medication unavailability. Last but not least, 57.5% of patients have voluntarily requested a cheaper replacement for their prescribed medication at the pharmacy due to cost considerations. **Conclusion** The economic crisis has adversely affected healthcare services and medication availability and affordability in Mount Lebanon, leading to adverse health outcomes. This calls for urgent health policy interventions to mitigate the impact of the economic crisis on public health.

Ind-845 Impacts of Family Doctor System on Medication Adherence of Type 2 Diabetes Patients in China

PRESENTER: **Xichen Tong**
AUTHORS: Haiyan Zou, Luying Zhang, Wen Chen

Background: Nonadherence to medication is a prevalent issue among patients with type 2 diabetes mellitus (T2DM). The family doctor system promotes continuous, integrated, and personalized primary care, which has the potential to improve medication adherence. However, more evidence is needed regarding causal association between family doctor system and medication adherence.

Aim: This study is to assess the impact of the family doctor system on medication adherence among T2DM patients.

Methods: This cohort study analyzed data from 2014 to 2019, drawn from three administrative databases in an eastern city of China, a pioneer in the implementation of the family doctor system. Adult patients with T2DM who continuously registered with family doctors from 2015 to 2019 (n=18,841) were assigned to the intervention group, while those who never registered during this period (n=1,429) were classified as the control group. A difference-in-differences design was employed to compare medication adherence between registered and unregistered T2DM patients after the first stage of family doctor system in 2015 and the second stage in 2018. Propensity score matching was applied to ensure the robustness. The mean proportion of days covered (PDC), and proportion of patients with good adherence (PDC≥80%) were the outcomes of interest. All recommended T2DM medications were included to calculate PDC.

Results: Compared to the unregistered group, PDC across all institutions for registered patients increased by 5.02% ($p<0.001$) after the first stage of family doctor system and by 5.88% ($p<0.001$) after the second stage. The proportion of patients with good adherence increased by 9.49% ($p<0.001$) and by 11.79% ($p<0.001$) after two stages, respectively. The improvement in medication adherence was more pronounced among patients managed in community health centers. In community health centers, the PDC increased by 5.53% ($p=0.003$) during the first stage and by 8.07% ($p<0.001$) during the second stage. Similarly, the proportion of patients with good adherence increased by 11.91% ($p<0.001$) and by 19.27% ($p<0.001$), respectively in each stage. Despite these improvements, the overall rate of good adherence among registered patients in 2019 remained relatively low, reaching only 59.77%.

Conclusions: The family doctor system significantly improved medication adherence among T2DM patients by providing patient-centered, continuous, and integrated primary services, especially in community health centers. Nevertheless, further efforts should be made to enhance medication adherence.

abs-os574 U.S. State Regulations and Co-Location of Opioid Treatment Prescribers

PRESENTER: **Joanne Spetz**, University of California San Francisco
AUTHORS: Laurie Hailer, Bethany Phoenix, Susan Chapman, Matt Tierney

Background and Aims: In 2017, new regulations in the United States allowed nurse practitioners (NPs) and physician assistants (PAs) the ability to become authorized to prescribe buprenorphine for opioid use disorder treatment in office-based settings, which was previously limited to physicians. Prior research has found that state regulations limiting the ability of NPs and PAs to prescribe medications without physician oversight slowed the rate at which they pursued authorization to prescribe buprenorphine. This slowing could affect both the extensive margin – the geographic spread of buprenorphine-authorized clinicians – and the intensive margin – the number of authorized clinicians located in a specific area. This paper posits that regulations that require physician oversight of NPs and PAs inhibited their applications for approval to prescribe buprenorphine but also created a barrier to them establishing new practice sites (i.e., reduced geographic spread). We examine the locations of newly-authorized NPs and PAs to learn the degree to which their ability to obtain authorization affected both the extensive and intensive availability of buprenorphine-authorized clinicians.

Methods: Our primary data source is the roster of clinicians who had authorization to prescribe buprenorphine as reported by the U.S. Drug Enforcement Agency (DEA) from 2019 through 2022. These data were merged with indicators for the regulatory environment faced by NPs and PAs, including whether they must have physician oversight and whether physicians must co-sign prescriptions. We also added control variables to measure health care infrastructure, opioid-related policy investments, demographics, and economic characteristics at the county level. We are estimating regression equations for whether a newly-authorized clinician being in a new location is associated with state regulations and other locational characteristics. We will test whether variables indicating that physician oversight is required for prescribing have a statistically significant effect on the likelihood of co-location. We also will interact indicators for physician oversight requirements with rural location to learn whether these regulations have a greater impact on co-location in rural communities.

Key Results: Preliminary analyses have found that NPs are less likely to have waivers when they are required to have physician oversight, but that PA regulations do not have a significant effect on the (low) share of PAs with waivers. Analyses also have found that these effects are greater in rural communities, suggesting that physician oversight requirements may affect the geographic spread of buprenorphine treatment.

Conclusions and Implications for Policy and Practice: The expansion of the clinician workforce providing buprenorphine treatment is important to addressing ongoing treatment needs of people with opioid use disorder. Restrictions on NPs and PAs could have particularly important effects in rural communities, because prior research finds that not only are NPs and PAs more likely to practice in rural areas of states that allow them to practice independently but they also are often the only health care clinicians in underserved communities.

8:30 AM –10:00 AM TUESDAY [Health Beyond The Health System]

Bali International Convention Centre – Surabaya

Food and Nutrition

MODERATOR: **Bernard Moscoso**,

Ind-2135 Developing a Preliminary Health Economics Model Structure for Household Food Insecurity and Child Health Outcomes within a UK Context

PRESENTER: **Sarah Abraham**
AUTHORS: Laura Gray, Anthea Sutton, Penny Breeze, Hannah Lambie-Mumford

Background

Household food insecurity (HFI) is characterised as disruption to usual dietary intake and/or eating habits due to lack of money or other resources, at the household level. HFI can have detrimental impact on child physical and psychosocial development. Latest figures from the Department of Work and Pensions reported that in 2023, 17% of children were living in low and very low food secure households. School-based feeding interventions in the UK may mitigate the harmful impact of HFI on child health. To evaluate these interventions for their impact on child health as public health interventions, a model structure that characterises the relationships between HFI and child health must first be developed.

Aim

The aim of this study was to develop a conceptual model and preliminary model structure for HFI and child health outcomes in preparation for the development of a public health economics microsimulation model.

Methods

Two rapid reviews were conducted to (i) summarise the quantitative evidence supporting relationships and mechanisms between HFI and child health outcomes in high-income, English-speaking countries and (ii) summarise the current evidence on the effectiveness and cost-effectiveness of UK school-based feeding interventions for their impact on HFI-related child health outcomes. A stakeholder engagement workshop was organised to develop a conceptual model for HFI and child health outcomes, with support from the reviews. Stakeholders identified key pathways and outcomes to be included in the preliminary model structure. To test the hypothesised structure, linear regression models were estimated to evaluate the relationships between HFI and child diet quality, while structural equation modelling (SEM) examined the relationships between HFI, child behaviour and parent mental health. Data analyses were conducted on children aged 7-11 years of the Born in Bradford (BiB) and BiB1000 Growing Up studies.

Results

The first review identified that HFI was associated with child health outcomes via two pathways (i) nutritional and (ii) mental health, including a potential mechanism of action via parent mental health. The second review identified key school-based feeding interventions in the UK and found a significant impact of these interventions on child diet quality, and improvement in child weight status. Stakeholders considered the findings from these reviews and concluded that the HFI and child diet pathway, and HFI and, child mental health pathway, incorporating parent mental health, would be key components of the preliminary model structure. A multivariate linear regression model, stratified by ethnicity, found that HFI was not associated with child diet quality. The SEM found that HFI had an indirect relationship with child internalising, externalising and prosocial behaviour via an impact on parent mental health, but did not directly influence child behaviours.

Conclusion

HFI was not associated with child diet quality, nor directly associated with child behaviour. An indirect pathway between HFI and child behaviour via parent mental health, as a mediator, was identified. A health economics model evaluating interventions that aim to target HFI and its health impacts on children, should consider these complex relationships. Further research is required to understand the relationship between HFI and child dietary intake.

Ind-1294 Intergenerational Educational Effect of In-kind Transfer Program on Child Nutrition: Evidence from India

PRESENTER: **Nisha Mishra**
AUTHOR: Sukumar Vellakkal

Abstract

Background: Though India is fifth largest economy in the world, its nutrition status is alarming as the country ranks 105th out of 127 countries as per Global Hunger Index, 2024. Bihar, one of the poor performing states of India share disproportionately huge burden of child malnutrition with 43% of child being stunted and 23% wasted. One of the strongest predictors of child health is mother's education as an educated mother has better knowledge of health care and nutrition. With the stated goals of increasing girl's school enrolment rate and minimising their school dropout by making it easier for them to access school, the state government of Bihar in 2006 introduced the cycle program namely Mukhyamantri Balika Cycle Yojana. The program provides money to all the girls enrolled in class 9 in a government aided school. The existing literature have studied the program's effect on secondary school enrolment of girls and girl's empowerment in addition to spillover effects on non-targeted females. We add to the literature by studying the intergenerational effect of the program channelised through mother's education on nutrition outcomes of their children in long-term. We also investigate the potential mechanisms driving our results.

Data and Methods: Using data from National Family Health Survey, round-4 conducted in year 2015-16, we employ difference-in-differences technique to estimate the causal effect by exploiting the state and age cohort variations. We consider the girls who have passed their senior secondary examination before 2006 (who were not eligible to get program benefit) as control group whereas the younger girls supposed to enter class 9 in 2006 or later, as the treatment group. Since, the program was implemented in 2006 only in the state of Bihar, we use two states: Jharkhand and Uttar Pradesh as the control states as they geographical and cultural proximity to Bihar.

Results: The main finding of the study indicate that the program has positive effects for children of mothers benefitted through the cycle program. Their health outcomes have improved significantly. A child born to the mother exposed to program are less likely to be stunted and underweight. The potential channel underlying these favourable effects are detected to be increase in mother's years of education, attainment of secondary level of education, and their age at marriage, decline in fertility, and exposure to media like newspaper and radio.

Discussion: The objective of the cycle program was to reduce the gender gap in school by increasing school enrolment for girls, but it has provided several unintended effects to the beneficiaries. By analysing its long-term effect in our study, we suggest the policymakers to focus and supplement such policies with other intervention to have better spillover and intergenerational effects in long run. To combat issues like malnutrition, they need to consider the interdependency of health and education with adequate infrastructure investments in both sectors.

JEL classification: H52, I10, I16, I28

Keywords: Cycle program, intergenerational, child health, education, Bihar, India

Ind-1607 Association of Food Environment with Diabetes-Related Health Outcomes: Diet, Weight, and Obesity

PRESENTER: **Rocio Garcia-Diaz**
AUTHORS: Marisa Miraldo, Miguel Talamas, Ernesto Del Castillo, Edson Servan--Mori

Background. The prevalence of diabetes in Mexico has surged from 6.7% in 1994 to 15.8% in 2022, a trend linked to dietary changes and increased consumption of processed foods as economic growth and globalization expanded food options. Current research highlights the influence of neighborhood environments and food availability on obesity and diabetes risks, yet is limited by cross-sectional data, inadequate classification of food outlets, and insufficient insight into household food purchasing decisions. The economic burden of diabetes remains substantial, with management costs rising by 26% from 2016 to 2018, imposing significant pressure on Mexico's fragmented health system and impacting equity in healthcare access. Past policy interventions, including taxes on sugary drinks and junk food, school bans, and labeling initiatives, have had limited success due to weak enforcement and public awareness challenges. Addressing diabetes requires robust data, comprehensive prevention strategies, and targeted policy interventions to support informed food choices and mitigate the health and economic impacts of diabetes in Mexico. **Methods**.We used data from the Mexican National Health and Nutritional Survey (ENSANUT), the National Household Income and Expenditures Survey (ENIGH), the National Directory of Economic Units (DENUE), and the Economic Census to analyze food environments and diabetes-related health outcomes across Mexico. Using variation within neighborhoods and across time in the retail landscape, we examine how proximity and density of food outlets impact healthy food intake and health outcomes related to diabetes, controlling for confounding factors at the household, individual, and locality levels. We instrument the entry of convenience chains and supermarkets with an instrument analogous to Talamas Marcos (2024) that leverages regional economies of scale at the firm level and suitability for these establishments measured as the prevalence of wide streets. This approach aims to substantiate a causal relationship between food environments and diabetes-related health outcomes, advancing beyond mere associations. **Conclusion**. Our study provides a comprehensive approach by using GIS data to define food environments at a household level, offering a thorough assessment of not only associations with obesity but also food habits and other dynamics that contribute to diabetes-related health outcomes within households. It fills a gap in the literature by exploring causal mechanisms rather than merely identifying associations between type 2 diabetes (T2DM) and food environments. These insights can inform public health strategies, interventions, and policy directions aimed at addressing diabetes and improving dietary habits. **Keywords:** Food environment, geographical information systems (GIS), Type 2 diabetes (T2DM) related outcomes, household food habits, hierarchical multilevel analysis, instrumental variable

Ind-2506 Does Food Inflation During Pregnancy Affect Stunting?

PRESENTER: **Hisbi Asyihristani Rijal**
AUTHOR: Pipit Pitriyan

The occurrence of food inflation during mother's pregnancy and early life of infants might affect household consumption pattern, i.e., by shifting to low nutrition that further brings a potential risk for mother's and baby's nutrition adequacy. This study aims to estimate the effect of food inflation on stunting by combining data from Indonesia Family Life Survey (IFLS) Wave 4 (2007) & 5 (2014) and food inflation from the CBS (BPS) of Indonesia. We take under-five aged children's as unit of analysis. Knowing the child's month and year of birth from IFLS allows us to track the period of his/her mother's pregnancy. We then collect two kinds of food inflation data, i.e., during maternal 9-month pregnancy and during the early 5-month life of the infants. Since the CBS inflation data covers only 66 cities, we apply the Euclidean distance to employ a spatial nearest neighbor method that enable us to determine the food inflation rate for other cities in the IFLS out of the 66 cities. By performing logit regression analysis, our study finds that a percentage increase of food inflation during 9-month pregnancy increases the probability of stunting by 3 percentage points ($p < 0.01$), while the food inflation during the early 6-month of infants life has statistically insignificant on the prevalence of stunting. Other variables with significant and positive effect on stunting including low birth weight, maternal age, parental heights, paternal years of education, maternal years of education, per capita expenditure quintile, and residential area status. This study results urge food price stability and adequate nutrition during pregnancy.

Ind-2651 Pregnancy, Food Purchases and Nutritional Quality

PRESENTER: **Gabriella Conti**, Department of Economics and Social Research Institute, University College London
AUTHORS: Paula Spinola, Stephanie von Hinke, Melanie Luhrmann, Britta Augsburg

Background:

Pregnancy is a critical period for health investments that significantly impacts child development and lifelong outcomes. While extensive public health guidance promotes healthy eating during pregnancy, little causal evidence exists on how conception impacts households' nutritional

choices and environments.

Methods:

We analyze household scanner data from the UK (2005-2019) covering detailed food purchases and nutritional content. Using an event study design with the Borusyak et al. (2024) imputation estimator, we examine changes in food purchases from 24 months pre-conception through pregnancy and up to one year post-birth. We measure nutritional quality using the UK Food Standards Agency's nutrient profiling model to distinguish between healthy and less healthy foods.

Results:

We find that households increase calorie purchases by approximately 200 calories per day during the third trimester, aligning with NHS guidelines. However, the nutritional quality of purchases deteriorates substantially, with the share of calories from less healthy foods increasing by 2.5 percentage points during pregnancy. This represents about 50% of the difference in healthy calorie share between normal weight and obese individuals, and occurs despite households halving their alcohol purchases during pregnancy. We observe that households reduce purchases of protein-rich foods while substantially increasing sweets and prepared foods. Sugar consumption increases by 5% during the first two trimesters, resulting in approximately 4kg additional sugar consumption over pregnancy. This increase is particularly pronounced among households with higher pre-conception alcohol purchases. These changes in nutritional quality happen regardless of socioeconomic status, pregnancy risk factors such as maternal age and pre-conception BMI, or food price environments. The shift away from alcohol comes with adverse substitution effects, as households with higher pre-conception alcohol purchases show larger increases in sugar consumption during pregnancy.

Conclusions:

We find that pregnancy triggers substantial dietary changes that are largely detrimental to nutritional quality, occurring universally across socioeconomic groups. This suggests that current public health messaging around pregnancy nutrition may be insufficient. Our findings indicate a need for more targeted interventions to support healthy eating during pregnancy, particularly given the importance of prenatal nutrition for child development. The substitution of reduced alcohol consumption with increased sugar intake suggests a need for specific guidance on healthy alternatives when reducing alcohol during pregnancy. These results are highly policy-relevant, suggesting that pregnancy may be a particularly fragile period for nutrition despite its critical importance for both maternal and child health outcomes.

8:30 AM –10:00 AM TUESDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Magnolia

Equity in Health: Time Preferences, Income, and Health Insurance in Asia

MODERATOR: **Adiatma Y.M Siregar**, "Center for Economics and Development Studies (CEDS), Department of Economics, Faculty of Economics and Business, Universitas Padjadjaran"

Ind-2214 Time Preference in the Health Domain Among Rural Adults in China

PRESENTER: **Qiqi Liu**
AUTHORS: Cong Li, Jingxian Wu, Danlei Chen

Background: Time preference, a critical component of inter-temporal decision-making, is closely associated with health behaviors and medical choices. In the context of China's urbanization, rural adults—often in socioeconomically disadvantaged positions—face significant health challenges. Despite its importance for public health and sustainable development, time preference among rural adults remains underexplored. Moreover, given the primary focus on time preferences in the financial domain and the domain independence, investigating this population's health time preferences is especially relevant. This study aimed to elicit and describe the time preference in health domain among rural Chinese adults, with comparison to it in the financial domain, and identify its associated factors, thus providing insights to inform targeted health interventions and policies.

Methods: Data were collected through a structured household survey conducted in six counties of Shaanxi Province, China, during July and August 2023. Using a multistage stratified random sampling method, the survey included 1,523 rural individuals aged 18 to 65 from 885 households. In the empirical framework, time preferences in the health domain were elicited using iterative choices between immediate mild health losses and delayed severe health losses, with indicators calculated using exponential, hyperbolic discounting, quasi-hyperbolic discounting models, including variable and fixed present bias cost. Then the best-fitting discount model in the health domain was identified using the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC). Financial time preferences are elicited using multiple price lists(MPL) for losses. Nonlinear least squares regression were used to examine the determinants of time preference indicators, respectively.

Results: Rural adults exhibited significantly lower discount rates in the health domain compared to the financial domain, indicating greater patience for health-related outcomes. The quasi-hyperbolic specification with a variable present bias cost (r=0.270) was identified as the best-fitting discount model (AIC=16740.45; BIC=16763.63). Moreover, a future-oriented preference (β=7.833) rather than present bias was observed, with respondents showing a greater willingness to shift future health losses to the present. The determinants analysis shows that higher education levels, higher income, being married, larger household sizes, engagement in agricultural work, lack of medical insurance, and

having chronic diseases encourage individuals to consider longer-term health outcomes, while age, healthcare accessibility, and self-rated health have significant but directionally indeterminate effects on time preferences.

Conclusion: This study reveals that rural populations exhibit distinct time preferences in the health domain, characterized by a future-oriented perspective and lower discount rates compared to the financial domain. Key factors influencing time preferences include age, income level, education level, household size, marital status, work type, self-rated health, medical accessibility, coverage of medical insurance and health level. The findings underscored the importance of eliciting health time preferences using health outcomes rather than financial onescand highlighted the need for tailored interventions that consider individual time preference profiles, such as promoting health education and awareness among those with a lower long-term orientation. Particular attention should be given to vulnerable subgroups, including those with lower education levels, poorer health status, unmarried, and from poor households, by providing targeted resources to encourage proactive health behaviors.

Ind-2688 Decomposition of Income-related Health Inequality by Determinants and Dimensions Using EQ-5D-5L: A Cross-sectional Study in China

PRESENTER: **Jingxian Wu**
AUTHORS: Yaping Deng, Cong Li, Yuqi Yang
Background The EQ-5D-5L is a widely recognized instrument for measuring health status globally. Income-related health inequality, a critical public health challenge, has been extensively studied using EQ-5D-5L. However, most studies focus on the contributions of health determinants, overlooking the unique roles of health dimensions. This study bridges this gap by decomposing income-related health inequality among adults in China, considering both the determinants of health and the five dimensions of EQ-5D-5L. **Methods** A nationally representative sample of 29882 Chinese adults aged 18 and above was drawn from the 2023 Psychology and Behavior Investigation of Chinese Residents (PBICR). The concentration index (CI) was used to assess the socioeconomic-related inequality in EQ-5D-5L with household income level taken as the ranking variable. An integrated decomposition method was employed to identify the contributions of determinants and dimensions to the observed overall inequalities. **Results** The estimated CI for the utility value of EQ-5D-5L was 0.0092 ($p < 0.001$), indicating a pro-rich distribution of health outcomes. Pain/discomfort (PD) and mobility (MO) accounted for over 70% of the overall inequality. Chronic disease (20.99%), household income (20.65%), and sex-age (16.22%) were primary contributors, followed by family health (9.41%) and sleep quality (7.76%). Additional contributors included malnutrition risk (6.85%), health literacy (6.10%), and experience of negative events (5.79%). The contributions of leading determinants to the overall predicted inequality exhibited substantial heterogeneity across the five health dimensions. **Conclusion** This study provides insights on the sources of income-related health inequality by integrating the contributions of health determinants and dimensions. PD and MO are key drivers of overall inequality, with chronic disease, household income, sex-age, as well as determinants from psychosocial circumstances and behavioral risk factors, significantly contributing to disparities. The findings highlight the need for targeted public health policies addressing dimension-specific health disparities and socioeconomic inequalities to improve health equity in China. This dimension-based approach to inequality decomposition offers a framework for future research on multidimensional health inequalities.

**This study is funded by the National Natural Science Foundation of China (No. 72104196).

Ind-2220 Income-Related Inequalities in Chronic Pain Among Middle-Aged and Older Chinese Adults : A Population-Based Cross-Sectional Study

PRESENTER: **Kunlu Tong**
AUTHOR: Jingxian Wu
Background

Chronic pain is one of the leading causes of disability, especially for middle-aged and old adults, and has become an international public health issue. The growing aging population and income disparities worsen the unequal burden of chronic pain, which urged us to understand the role of inequalities on chronic pain to guide actions for pain prevention seeking to reduce its unequal burden. This study aimed to estimate the inequalities of chronic pain among people middle-aged and older in China, to analyze the determinants of pain.

Method

A total of 17,840 respondents over the age of 45 were sourced from the 2020 wave of the China Health and Retirement Longitudinal Study (CHARLS). Chronic pain is graded from mild to severe, based on self-reported pain levels, which include five levels. Income-related inequalities in chronic pain were assessed using the concentration index (CI), with per capita household income as the ranking variable. The recentered influence function (RIF) regression decomposition method was employed to identify the contributions of various determinants to chronic pain inequalities.

Results

The estimated CI for chronic pain is -0.0709 ($p<0.001$) in 2020, indicating pro-poor inequality in chronic pain among middle-aged and older adults. The decomposition analysis revealed that gender (8.0085%, $p<0.001$), education — particularly high school and above (5.3557%, $p<0.001$), and primary school education level (3.4793%, $p<0.001$)— were key factors contributing to increased inequality in chronic pain. In contrast, chronic disease and depressive tendency(-14.1684%, $p<0.001$) significantly reduced pain inequalities. Additionally, individuals with more than one chronic disease (-16.5084%, $p<0.001$) had a greater contribution to pain inequalities than individuals with only one chronic disease (-3.7753%, $p<0.001$). Other factors, such as area of residence (-3.1833%, $p<0.001$) and household per capita income (-1.0276%, $p<0.001$), were more consistently associated with reduced inequalities.

Conclusion This study highlights pronounced pro-poor income inequalities in pain among middle-aged and older adults in China. Socioeconomic factors and physiological factors, such as per capita GDP and chronic diseases, were more consistently associated with reduced inequalities, while education and gender factors were linked to increased inequalities. Public policies must consider low-income populations and gender disparities to reduce chronic pain inequalities. Reducing economic disparities between regions and improving the health literacy of older adults are also important strategies for reducing inequalities. Through this approach, it is expected that the impact of pain on the healthcare system will be reduced, helping to achieve healthy aging and an improved quality of life for all.

This study is funded by the National Natural Science Foundation of China (No. 72104196).

Ind-2652 Redistributing Indonesia National Health Insurance Members: Opportunities to Enhance Public Health Performance and Financial Considerations

PRESENTER: **Ulfathea Mulyadita**

Background: National Health Insurance (JKN) in Indonesia is managed by Social Security Administering Body on Health (BPJS-K). It covers all public and selective contracts with private primary health care (PHC) facilities. At the PHC level, the majority of JKN members are registered to public facilities, known as Puskesmas (78.8%), followed by private clinics (13.7%) and the General Practitioners (4.5%). This means the current doctor-JKN member ratio in Puskesmas is higher than private facilities (1:6,373 vs 1:1,571), despite the ideal mandated ratio by BPJS-K regulation of 1:5,000. To improve equal distribution, the Government of Indonesia (GOI) is exploring alternative for redistributing JKN members from Puskesmas to JKN-contracted private PHC facilities. However, this redistribution policy might adversely affect Puskesmas' health financing since their capitation revenue might be significantly reduced due to shifting of registered JKN members as one of the multiplier factors. Accordingly, this study aims to explore the potential impact of JKN member redistribution on Puskesmas performance and PHC capitation revenue. **Method:** This study utilizes secondary data from 63 Puskesmas in Surabaya in 2021. It consists of the following: Puskesmas profiles, performance-based capitation indicators for personal health performance, and Minimum Service Standard (MSS) data for public health performance. The data analysis was conducted in three steps. First, compared all Puskemas performance scores with target indicators and created a composite score for both personal and public health performance. Second, performed a multiple regression analysis to quantify the impact between public health performance and the doctor-JKN member ratio. Lastly, conducted a simulation to explore JKN member redistribution to private facilities within a 3km radius based on the ratio and public health performance, estimating the potential loss of capitation revenue. **Results:** The results of personal health performance across the 63 Puskesmas indicated that all of them (100%) met the required indicators. However, public health performance results revealed that only one-third (34.9%) of the Puskesmas achieved their targets. Based on multiple regression analyses, a 10.5% reduction in the doctor-JKN member ratio significantly improved public health performance by 1% among all Puskesmas. Further simulation for one Puskesmas in Surabaya demonstrated that redistributing members from a ration 1:9,165 to 1:5,500 to nearby private facilities would be improve public health performance by 0.477%. but also, could potentially lead to a loss of up to 8,330 USD in capitation revenue. **Conclusion:** The study highlights the complex relationship between healthcare performance, doctor ratios, and financial sustainability within Indonesia's JKN system. The findings underlined the potential improvement in public health performance that should be supported by careful consideration of its financial implications, particularly regarding potential revenue loss for Puskesmas. The study suggests that such policies should be accompanied by regulations and incentives to maintain the financial stability of primary healthcare facilities. The role of special allocation funds (DAK) and other incentives to compensate for capitation revenue reductions is considered a potential solution to mitigate financial impacts.

8:30 AM –10:00 AM TUESDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Bali
Relationship Between Labor and Health

MODERATOR: **Hanifa Pilvar**, University of Oxford

Ind-1357 Sickness Absence as a Side Effect of Delayed Retirement: Evidence from France

PRESENTER: **Mohamed Ali BEN HALIMA**
AUTHOR: Ali Skalli

In 2010, a reform of the French pension system took place. It consisted in postponing the pension eligibility age by 2 extra-years within a rather short transition period as only the 1950-1955 generations were concerned. While the stated objective of the reform was the increase of senior workers' labor supply and the reduction of the pension insurance fund deficit, a number of studies have shown that similar reforms usually induce collateral effects as well, including shifts towards alternative insurance schemes such as unemployment or disability.

In order to assess the effect of the 2010 pension system reform on sickness absence, we use a 2005-2015 panel of administrative data that contains a wealth of information about individuals' working lives, on their individual characteristics, on their health as well as on sick leave. Clearly, the 2010 reform induced a shock that could be seen as a natural experiment and could be used to identify the causal effect of retirement age on sick leave. This, we believe, is an important issue as if such an effect turns out to be significant, then that would imply that while the reform aimed at reducing the pension insurance deficit, it actually also widened that of the public health insurance.

The issue at stake is that of determining the trend in sick leave of the treated generations (1952-1954) had they not been subject to the reform. Thus, the non-treated generations (1946-1951) are used to construct the counterfactual and the effect of interest is identified through

comparison of sickness absence records of the generations that are subject to the reform to those of the generations who are not, age and other characteristics held equal. Heterogeneity of the estimated effects is also examined in a two dimensions; namely gender and health status.

Our main result suggests the pension system reform has induced a significant increase in sickness absence for individuals older than 60, the estimated effects being differentiated according to both gender and health conditions. We consider alternative measures of sickness absence (the probability of being on sick leave and the cumulative annual sick leave duration) and show that the reform has indeed resulted in a significant increase in these. The highlighted effects are gender-sensitive and, most importantly, negatively correlated with senior workers' health status.

These results also imply that while the reform aimed at reducing the pension insurance deficit, it actually also widened that of the public health insurance. In France, sick pay has two main sources: a common and universal part provided by public health insurance and a complementary part provided by employers. This means that any increase in sickness absence is reflected in labor costs as well. The policy implications of these results are also worth discussing. To begin with, reforms based on the age parameters of the pension system should perhaps account for health-related heterogeneities. Perhaps, senior workers with poor health should be allowed to leave, especially when they started their career at early ages and/or when they have strenuous occupations.

Ind-1738 Working Hours and Workers Health: Evidence from a National Experiment in Sweden

PRESENTER: **Daniel Kuehnle**
AUTHORS: Nikolaos Prodromidis, Martin Karlsson

The regulation of working hours has long been a cornerstone of employment legislation, aiming to safeguard workers' physical and mental health while preserving labor productivity. However, credible causal evidence on the health impacts of reducing working hours, particularly over the long term, remains limited. This paper examines the causal effects of reduced working hours on mortality using high-quality population register data from Sweden, leveraging a nationwide policy introduced in 1920. The policy reduced working hours from 56 to 48 per week for about one-quarter of salaried workers, without reducing earnings. This reform represents a rare historical example of a substantial and exogenous reduction in working hours on a national scale.

We address two key research questions: (1) What is the causal impact of reduced working hours on worker mortality and longevity? (2) Through which mechanisms do these health benefits manifest? Employing a difference-in-differences framework, we compare mortality trends among workers eligible and ineligible for the reform. This approach exploits variation across occupations while accounting for time-invariant factors and secular mortality trends. Data sources include the 1910 Swedish Census, linked to the universe of death certificates, and additional administrative data digitized from historical records. We examine both immediate and long-term impacts on mortality and causes of death.

Our findings reveal that the policy led to a substantial reduction in mortality among treated workers, decreasing death rates by approximately 20% (0.2 percentage points annually) over the first six years of implementation. This translates to approximately 12,000 lives saved during this period. The mortality reduction was most pronounced among older workers, with notable declines in deaths due to heart disease and workplace accidents. Further analysis of longevity outcomes shows that the reform increased affected workers' life expectancy by approximately 0.6 years.

Mechanism analyses suggest that reductions in cardiovascular strain and workplace accidents drove these results. Digitized cause-of-death data indicates that heart disease mortality declined by 13% and workplace accident deaths by 20%. We find no significant effects on unrelated causes of death, such as cancer or tuberculosis, underscoring the specificity of the policy's health benefits. Importantly, earnings remained unchanged, isolating the health effects of reduced working hours from potential income effects. Robustness checks, including placebo analyses and various specification checks, confirm the validity of our findings.

These results highlight the potential health benefits of reducing long working hours, particularly in physically demanding occupations. In light of contemporary trends, where one-third of workers globally exceed 48 hours per week, these findings have significant implications for public health and labor policy. Policymakers should consider targeted reductions in working hours for labor-intensive occupations as a strategy to improve health outcomes and longevity, especially given the documented economic feasibility of such reforms.

Our study makes a novel contribution to the literature by providing the first causal evidence on the mortality impacts of reduced working hours in the short- and long-run using population-level data. While our findings are specific to early 20th-century Sweden, the results hold relevance for modern economies debating work-life balance and occupational health regulations.

Ind-2447 The Effect of Long-term Care Insurance on the Labor Market Outcomes of Household Members in South Korea

PRESENTER: **Hye Yoon Chung**
AUTHOR: Anna Kim

This study examines the short-term effects of long-term care (LTC) insurance on household labor market outcomes in South Korea, with a focus on gender differences. Using data from the Korea Welfare Panel Study, we apply a difference-in-differences event study design combined with propensity score matching to estimate the program's spillover effects at both the extensive and intensive margins. We find that LTC insurance increases labor force participation and part-time employment, while having a modest, statistically insignificant negative effect on full-time employment. At the intensive margin, a statistically significant positive effect is observed on part-time workers' earnings, with no significant effects on part-time work hours or full-time workers' earnings and hours. Gender-disaggregated analyses yield statistically insignificant effects, except for part-time employment on men. These findings underscore the importance of flexible employment arrangements in mitigating the labor market impacts of caregiving responsibilities and suggest that LTC insurance can play a valuable role in sustaining labor force participation, particularly through part-time work. While full-time employment is often prioritized in policy discussions, part-time work plays a

critical role in balancing work and care. Though the effects are modest in the short run, LTC insurance appears to help prevent workforce withdrawal, with meaningful implications for labor and social policy.

Ind-1333 Behavioural Responses to Disability Insurance Generosity Under Extensive Earnings-Cumulability

PRESENTER: **Michele Belloni**
AUTHORS: Vincenzo Carrieri, Francesca Zantomio, Irene Simonetti

In developed countries, Disability Insurance (DI) plays a pivotal role in protecting workers from financial instability following health shocks by providing income replacement. However, the design of DI programs significantly influences workers' responses to health shocks. Most existing studies examine DI systems where benefits diminish substantially once labor earnings cross low thresholds. For example, in the US, benefits are lost if reaching a low "substantial gainful activity" threshold, corresponding to about 36% of median labour earnings, creating disincentives to work. In contrast, this study explores DI systems with extensive earnings cumulability, where labor earnings can coexist with DI benefits up to high thresholds, minimizing these disincentives.

The focus is on Italy, where DI allows personal earnings to reach up to 97% of median earnings before any reduction in benefits occurs, and the reduction is modest (25%). This structure provides a unique context for examining labor market participation (LMP) and DI enrollment as separate phenomena. This paper leverages a 1995 Italian social security reform that altered the formula for calculating social insurance benefits, including DI. The reform reduced DI generosity for individuals entering the labor market after 1995 while keeping other design features constant. This change enables us to study behavioral responses to income effects. The analysis uses a unique administrative dataset (WHIP-Health), which links employment histories from a 7% sample of Italian private-sector workers with hospital discharge records, focusing on those who experienced acute cardiovascular (CVD) shocks, such as heart attacks and strokes, between 2003 and 2011.

While experiencing a CDV health shock, these workers faced variation in their prospective replacement rates based on a policy reform enacted at least eight years before the onset of the health shock under consideration. We exploit the combination of these features in a Regression Discontinuity in time Design framework centred around the timing of workers' labour market entry (implying lower current DI generosity for those entered after 1995).

In this way, we offer three main contributions to the existing DI literature. First, we offer novel empirical evidence on the behavioral responses to DI generosity in an extensive earnings-cumulability setting. We present LMP and DI elasticities estimates, representing distinct phenomena in this context. Second, because the normative framework enables us to capture an income effect, we enrich the currently limited evidence on behavioural responses relatable to an income, rather than a substitution, effect (as in Marie and Vall Castello, 2012 and Deuchert and Eugster, 2019). Third, the possibility of focusing on individuals who experienced a CVD shock helps address unobserved heterogeneity and the inherent challenge of observing the actual disability status of potential claimants, offering evidence on a sample of plausibly eligible individuals and thus limiting the role of adjudicators' discretion.

We observe a substantial response in DI participation to reduced benefit generosity. Conversely, the labour supply adjustment is minor, driven by immigrant workers. Overall, our results suggest that DI benefits are broadly perceived as complementary to labor income in an extensive earnings-cumulability context, with important implications for the design of labor-inclusive DI schemes.

Ind-1839 The Impact of Mental Health on Labour Market Outcomes: New Evidence from Genetic Markers

PRESENTER: **Sonja De New**, Monash University
AUTHORS: Danusha Jayawardana, John De New, Clement Wong, Nicolau Martin Bassols

Background

Mental illness is a global health issue where one in five individuals are affected by a mental health condition at any given time. As an important aspect of human capital, mental health can directly impact a number of labor market outcomes. Employing conventional identification strategies such as panel data techniques and instrumental variables (IV) estimators, previous economic studies show that poor mental health adversely affects labor market in terms of lower employment (Frijters et al 2014), earnings (Biasi et al 2021, Levinson et al 2010), and productivity (Bubonya et al 2017, Stewart et al 2003). However, establishing a causal relationship between mental health and labor market outcomes is empirically challenging due to several well-established endogeneity concerns. First, mental health may affect employment outcomes and employment outcomes may affect mental health, resulting in reverse causality or simultaneity bias. Second, the use of self-reported measures of mental health and employment outcomes may lead to measurement error. Third, unobserved confounders such as childhood circumstances, cognitive ability, genetic endowment that affect both mental health and employment can lead to biased estimates. While conventional methods are valuable, they fall short of fully addressing all of the above concerns of endogeneity, as highlighted by Frijters et al (2014) and Bubonya et al (2014).

Contribution and Method

The strong associations between mental health and labor market outcomes are well documented, but are often entangled in concerns over reverse causality. In this paper, we use polygenic risk score (PRS) information from the Health and Retirement Study (HRS) to examine how the genetic risk of depressive symptoms, preceding the individual's labor market participation, are associated with employment outcomes later in life. As we use the medically-assessed polygenic risk scores on the narrow sample of adults of European descent, specific to each individual in our sample, and we provide sensitivity analysis addressing assortative mating and pleiotropic pathways, this study contributes to the literature on the causal effects of the genetic predisposition of depressive symptoms on labor market outcomes. Identifying causal effects, rather than mere correlations, is crucial for informing targeted interventions. Additionally, we contribute to the literature by investigating whether individuals with poor mental health tend to select into lower-quality jobs using a wide range of job characteristics, thus providing insights for creating more supportive work environments.

Results

Whilst both men and women experience significant and substantial earnings reductions with higher PRS scores, we also find gender differences: women with greater genetic risk of depressive symptoms tend to work fewer years than lower risk women; men with greater risk work similar years to lower risk men, but work in jobs with fewer abstract and higher manual tasks. Moreover, we use detailed O*NET information to show that men at greater risk of depressive symptoms work in jobs facing more hazardous conditions, and with fewer interpersonal interactions. Our findings suggest that with a higher genetic risk of depressive symptoms, women participate less in the labor force whereas men select into less desirable jobs, diminishing lifetime earnings trajectories in either case.

8:30 AM –10:00 AM TUESDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Nusantara 1

Outcomes, Measurement and Performance

MODERATOR: **Julie Ratcliffe**,

Ind-2408 Infant Toddler Quality of Life Questionnaire (ITQOL) Among Cerebral Palsy Children in GAME trial

PRESENTER: **Xin Zhan**

AUTHORS: Catherine Morgan, Iona Novak, Rachael Lisa Morton, Xin Zhan

Background Cerebral palsy (CP) can yield a large and life-long economic burden on families and society. A randomized clinical trial was conducted to assess improvements in motor and cognitive skills. Infant quality of life measured by the Infant Toddler Quality of Life Questionnaire (ITQOL) was an important secondary outcome. **Aim** This study aimed to investigate ITQOL overall and domain scores, for intervention and standard care groups; and examine determinants of change in scores at one and two years following randomization. **Methods** Parent-reported ITQOL scores were collected at year one and two among the intervention group (n=150 infants) and standard care group (n=152 infants). Non-parametric Kruskal Wallis tests were used to analyze the difference in ITQOL overall and domain scores. Generalized linear models with repeated measures and random intercept were constructed to examine the changes in ITQOL scores at two years. **Results** There was no significant impact of the GAME intervention on ITQOL overall scores over time (p=0.09 at year 1 and p=0.25 at year 2). However, there was a significant impact of treatment over standard care over time on some domain scores including, general health perception improvement (Estimate: 5.65, SE:2.30, p=0.01); physical abilities (Estimate: 8.19, SE: 3.01, p=0.01) at year one and (Estimate:12.67, SE: 3.29, p<0.05) at year two; pain and discomfort (Estimate: 10.55, SE: 2.79, p<0.05). Infants with suspected but not diagnosed CP; families with high incomes; families with disability funding; or with few siblings, showed a significant improvement in ITQOL scores over time (Estimate: 2.73 [SE: 0.88], 8.51 [SE: 2.65], 2.35 [SE: 1.00], 1.29 [SE: 0.64], respectively). **Conclusion** Strategies to support families with infants who have a CP diagnosis; are on low incomes; with more than one sibling; or families who do not have disability funding; are needed to improve infant quality of life.

Ind-49 Validity, Reliability, and Framing Effects in Equity-Efficiency Trade-off Studies: A Systematic Review

PRESENTER: **Shehzad Ali**, Western University

AUTHOR: Victoria Chechulina

Objectives Health system resources are limited, and decision makers often need to make trade-offs between equity and efficiency. Such trade-offs are guided by public values that are elicited using choice experiments. There is no standard approach to elicit equity-efficiency trade-offs. Previous studies have found significant variability in public values, raising concerns about the robustness of trade-off experiments. The objective of this systematic review was to determine whether and how equity-efficiency trade-off studies consider validity, reliability and framing effects. ***Methods*** We searched Medline, EMBASE, and Web of Science in January 2024 for health-related equity-efficiency trade-off studies. Two reviewers independently screened titles and abstracts, followed by full-text review, data extraction, and quality assessment. ***Results*** 115 equity-efficiency trade-off studies were identified, of which 29 studies (25.2%) investigated validity, reliability, and/or framing effects. 14 (12.2%) studies assessed validity, 9 (7.8%) studies assessed reliability, and 10 (8.7%) assessed framing or cognitive effects. Validity was most frequently assessed by comparing results to hypothesized expectations, while reliability was commonly assessed by providing a repeated test or questionnaire. Framing and cognitive effects were assessed by varying question order or changing the wording or framing of the scenario. 19 of 23 studies reported high or acceptable validity or reliability, and 5 of 10 studies found no significant framing or cognitive effects. ***Conclusion*** This systematic review highlights the need to consider robustness of elicited values in choice experiments. It will also guide future choice experiments that aim to estimate inequity aversion.

Ind-991 Developing an Australian Value Set for the Recovering Quality of Life (ReQoL) Instrument using Discrete Choice Experiment with Duration

PRESENTER: **Cathy Mihalopoulos**

AUTHORS: Thao Thai, Lidia Engel, Richard Norman, Brendan Mulhern, Jemimah Ride

Objectives

The Recovering Quality of Life (ReQoL) instrument was designed to measure the quality of life outcomes for people over 16 years of age with mental health problems. Our study aims to elicit societal preferences for the ReQoL-Utility Index (ReQoL-UI) health states within the Australian context to facilitate more informed decision-making in Australia.

Methods

A discrete choice experiment (DCE) with duration was embedded in a self-complete online survey and administered to a representative sample (n=1019) of the Australian adult population, stratified for age, sex and geographic location. A partial subset design DCE was used with 3 fixed attributes and 5 varying attributes containing 240 choice tasks that were blocked into 20 blocks, so that each respondent was assigned a block of 12 choice tasks. The value set was modelled using the conditional logit model with utility decrements directly anchored on the 0 to 1 dead-full health scale. Preference heterogeneity was tested using the mixed logit model. A range of models were tested to smooth out the disordering of the utility estimates and to investigate potential interaction effects between dimensions.

Results

The final value set reflects the monotonic nature of the ReQoL-UI descriptive systems while showing stability even considering preference heterogeneity. The best health state defined by the descriptive system has a value of 1 and the worst state has a value of −0.585. Across all attribute levels, physical health level 5 had the largest utility decrement, followed by physical health level 4. The third important level was well-being level 5, followed by hope level 5. In contrast, control level 2 and 3 had the smallest utility decrement (0.01), meaning that these differences in levels of the control item have the least impact on utility.

Conclusion

The value set, which reflects the preferences of the Australian population, facilitates the calculation of an index value for use in the estimation of quality-adjusted life years (QALYs) for cost-utility analyses of mental health interventions in Australia.

Ind-1120 Identifying Suitable Methods to Implement the South African Value Framework in HTA (SAVE-UHC)

PRESENTER: **Celeste Claire Holden**
AUTHORS: Simon Walker, Evelyn Thsehla, Peter Murphy, Yirui Qian, Susan Griffin

Introduction In pursuit of universal health coverage (UHC) countries must use their resources in a fair and efficient manner. Health technology assessment (HTA) uses available evidence to assist in priority setting. HTA traditionally focuses on clinical efficacy, and cost per unit change in health outcomes. More recently, HTA institutions are seeking to incorporate additional value elements in cost-effectiveness analyses such as equity, disease severity and non-health outcomes. South Africa (SA) proposes to create an HTA body through the National Health Insurance (NHI) bill. In anticipation, the South African Values and Ethics for Universal Health Coverage (SAVE-UHC) value assessment framework (VAF) has been created. SAVE-UHC consists of 12 value elements which were determined and tested by a multidisciplinary working group. Despite the framework making explicit the aspects that should be valued in priority setting, the methods and approaches available to operationalize the VAF in an HTA setting have yet to be defined. To address this, we ask how these value elements can be measured in HTA in the South African context? **Methods** We first conducted a mapping exercise from an existing VAF, the International Society for Pharmacoeconomics and Outcomes Research Value Flower (ISPOR VF) to SAVE-UHC. The ISPOR VF describes 12 value elements and proposes potential methods which could be applied for each value element. We categorised results of the mapping exercise into ‘good match’, ‘partial match’ or ‘no match’. In cases of good and partial matches, the methods identified for ISPOR VF could potentially be used for SAVE-UHC. To supplement the methods gleaned from the mapping exercise, we consulted experts in health economics and public health through an online survey and stakeholder workshop. **Results** The mapping exercise showed 5 good matches, 7 partial matches and 2 non-matches. Based on these matches, a list of metrics, approaches to valuation and methods from the ISPOR VF are suggested for the SAVE-UHC elements which had good and partial matches. The online survey provided additional methods for each value element of the SAVE-UHC framework which are presented in the results table. The methods gleaned from the mapping exercise and survey were further discussed in the workshop in terms of their appropriateness, practicality and acceptability. **Conclusions** South Africa, like many other countries, does not yet have a formal explicit approach of considering additional value elements in decision making processes like HTA. This research presents a wide range of methods from different sources which may be used to measure value elements in HTA alongside a context-specific VAF. The approach we used to gather these methods could also be used in other countries seeking to implement their own VAF. Further research is required to determine which of the methods presented in this study are practical and useful to implement given the data and resource constraints in the South African context.

Ind-2389 Psychometric Performance of Preference-Based Instruments in Older Adults: a Systematic Review

PRESENTER: **Valeriia Sokolova**
AUTHORS: Lidia Engel, Jan Faller, Yared Belete Belay, Pei Wang

Background: Population aging is a significant global public health concern. Preference-based instruments are effective tools for assessing the impact of ageing on health-related quality of life (HRQOL) and for evaluating the cost-effectiveness of health and social care interventions. With the coexistence of various preference-based instruments, it is crucial to determine which measure is most suitable for use in older adults.

Aim: The aim of the study was to systematically review and summarize the current evidence on the psychometric properties of preference-based measures in older adults across different settings.

Methods: Four major databases (Medline, Embase, PsycINFO and CINAHL) were searched for original studies, complemented by a forward and backward citation search. Peer-reviewed studies assessing measurement properties including reliability, validity, sensitivity, and

responsiveness of preference-based instruments in older adults (i.e., age ≥ 65 years) were included in the review. Two independent reviewers screened titles, abstracts, and full-text and extracted key information of studies. The methodological quality of included studies was checked using the COSMIN risk of bias checklist.

Results: In total, 90 studies met the inclusion criteria, examining the psychometric performance of the following measures: EQ-5D-3L=47, EQ-5D-5L= 30, ICECAP-O=20, ASCOT=10, SF-6D=6, QOL-ACC=6, HUI3=7, HUI2=5, QWB=4, WOOP=3, AQoL-8D=2, 15D=1. The EQ-5D measures (-3L and -5L) were evaluated across all psychometric properties, with most studies indicating strong performance for both versions. However, some studies highlighted limitations, including ceiling effects, inter-rater reliability issues, and conflicting findings regarding responsiveness to change. Strong supportive evidence was observed for the ASCOT and ICECAP-O even though both measures require further evaluation in terms of their responsiveness to change. Limited evidence was available for the SF-6D, HUI2, HUI3, QWB, AQoL-8D and 15D with existing studies showing mixed results overall. While recently developed, emerging evidence supports the psychometric properties of the two older adult-specific preference-based measures, QOL-ACC and WOOP. However, further research is needed to assess their responsiveness to change and reliability.

Conclusions: Preference-based measures are widely used among older adults but evidence regarding their psychometric performance remains limited. To better inform the selection of measures for future economic evaluation studies, further research is needed, particularly head-to-head comparisons using a consistent methodological approach.

Ind-2686 A Heterogeneity Analysis of HRQoL in Early Adults Born Very Preterm or Very Low Birthweight: Evidence from a Meta-analysis

PRESENTER: **Corneliu Bolbocean**

Aim: Preterm birth and low birthweight negatively affect health-related quality of life (HRQoL) into early adulthood. However, it remains unclear which subgroups of individuals are most affected. We aimed to explore heterogeneity in the effects of very preterm birth or very low birthweight birth (VP/VLBW) on HRQoL in early adulthood with respect to sociodemographic factors. **Data:** Individual participant data were obtained from five longitudinal prospective cohorts of adults born very preterm (VP; <32 weeks' gestation) or with very low birthweight (VLBW; <1500 g) and normal birthweight (≥2500 g) or term-born (≥37 weeks' gestation) controls contributing to the 'Research on European Children and Adults Born Preterm' Consortium. The main exposure was VP/VLBW. Outcome measures included multi-attribute utility scores generated by the Health Utilities Index Mark 3 (HUI3), self-reported at mean ages of 18-26 years. **Methods:** We used novel machine learning methods to identify the risk factors associated with differences in HRQoL. Specifically, we applied Causal Forests (CF) and Shrinkage Bayesian Causal Forests to estimate conditional average treatment effects (CATEs). Heterogeneity in CATEs was explored across the following subgroups of VP/VLBW adults: maternal age, education and ethnicity, and interactions between the three subgroups. **Results:** The effect of VP/VLBW birth varied by maternal age and maternal education. VP/VLBW individuals born to the youngest mothers (≤25 years) had a mean decrement in HUI3 utility score of -0.08 (95% CI −0*.13*,* −0*.02), which was a larger decrement compared with births to mothers aged 26-30 years (-0.02; 95% CI -0.05, 0.01) and ≥31 years (-0.03; 95% CI -0.06, 0.00). We found a mean decrement of -0.05 (95% CI -0.09, -0.01) for VP/VLBW born to mothers with the lowest educational level, a decrement of -0.04 (95% CI −0.08*,* 0*.*00) for those born to mothers with a medium level of education, and an increase of 0.01 (95% CI -0.04, 0.06) for those born to mothers with highest educational level. **Conclusion**: The effects of VP/VLBW birth on HRQoL vary across subgroups defined by maternal characteristics. Further studies that estimate the effects of VP/VLBW status on HRQoL outcomes in mid and late adulthood across socioeconomic strata are needed. Targeted health interventions for VP/VLBW individuals born to younger mothers and mothers with lower educational levels are warranted to alleviate the risk of poorer HRQoL outcomes in early adulthood. **Keywords:** Heterogeneity of treatment effects, machine learning, preterm birth, HRQoL, quality of life.

Ind-2775 Mapping Health Outcome Measures and Health Crisis

PRESENTER: **Mona Aghdaee**, Macquarie University

Background: Nonpreference-based patient-reported outcome measures (PROMs) are popular in health outcomes research. These measures, however, cannot be used to estimate health state utilities, limiting their usefulness for Health Technology Assessment (HTA). Mapping PROMs to a multiattribute utility instrument is one solution. Mapping has become even more relevant with the occurrence of the COVID pandemic. The world of HTA has been affected by: exponential growth of infected adults, countries prioritising HTA related to COVID pandemic, and restrictions on normal operations for economic evaluations (HTA trials were indefinitely postponed/delayed or suspended during the pandemic). Moreover, COVID has also changed priorities and methods of working (remote working and social distancing rules), mode of healthcare delivery, and potentially influence individuals/patients' preferences. These factors will impact the HTA process including preference elicitation (PBM/non-PBMs) in post-COVID world. **Objective:** This study aims to inform post-COVID HTAs and assesses how the COVID pandemic has influenced preference elicitations by Australian and, consequently, the mapping algorithms. **Method:** Cross-sectional data were collected using two online surveys of the Australian general population. The first survey was conducted in February 2018, collecting data on (PROMIS10, EQ-5D-5D, AQoL-8D, Charlson comorbidity index) and the second survey was conducted during the first COVID-19 lockdown in June 2020. The secund survey collected data on the same instruments except PROMIS10. Instead, PROMIS29 was collected. Two physical and mental health summary scores were developed from PROMIS10 and were used to develop a mapping algorithm to predict EQ-5D-5L utilities in 2018 data. In the next step, the algorithm was used to predict EQ-5D-5L utilities in 2020 data. **Results:** In the year 2018, 2,015 Australians participated in the survey and 3,013 participated in 2020. Respondents from 2018 were more likely to have a comorbidity and reported lower EQ-5D-5L utilities. Propensity score matching was used to match respondents with using gender, age, and state. The mapping algorithm developed with data collected from the year 2018 could predict the utilities in year 2020 with relatively high accuracy (Mean Absolute Error (MAE) =0.2055). **Conclusion:** Previous research has shown that individuals' valuation of their health status may have been affected by COVID-19 pandemic. It is not clear whether the pandemic will be influencing mapping algorithms and subsequently economic evaluation in Australia. Our results might not reflect the actual impact of COVID-19, as in June 2020, Australians' health was not impacted by the pandemic and mechanisms such as lockdown and borders closure were in place to protect their health. The next step of our study is

collecting data on year 2022 and investigate the general population preference in the post-COVID era.

abs-os431 An Assessment of the Construct Validity of the ICECAP Capability Wellbeing Measure for Adolescents Aged 11 to 15 in the United Kingdom

PRESENTER: **Isabella Floredin**, University of Bristol
AUTHORS: Samantha Husbands, Philip Kinghorn, Katie Breheny, Louise Proud, Tim J. Peters, Joanna Coast, Paul Anand, Sarah Byford, Mr. Paul Mitchell

Introduction: A range of ICECAP capability wellbeing measures for children and young people (ICECAP-CYP) of different ages are currently in development for use in economic evaluation of health and care interventions. The ICECAP-CYP:11-15 instrument is a measure of capability wellbeing for young people aged 11 to 15. The descriptive system of ICECAP-CYP:11-15 was developed in the United Kingdom (UK) using in-depth and semi-structured interviews with young people and their parents/guardians. The measure comprises eight attributes important to capability wellbeing: *Fun and enjoyment; Learning and experiencing; Attachment; Emotional security and support; Achievement; Identity and choice; Physical safety; Aspiration.* To enable the use of the ICECAP-CYP:11-15 in economic evaluation, a survey was designed and piloted to provide values for these attributes and to examine the validity of the measure's descriptive system. Construct validity is an important element to explore for patient reported outcome measures to assess the extent to which the measure captures what it is intended to measure. This paper explores the construct validity of these attributes. **Methods:** A cross-sectional online panel survey was conducted with children and young people (CYP) aged 11 to 15 located across the UK. A representative CYP population (i.e. age and sex) was sampled through the survey company, embedded within the ICECAP-CYP:11-15 valuation study. Construct validity will be assessed by investigating whether the associations between the responses to the attributes of the ICECAP-CYP: 11-15 measure and other factors (i.e. socio-demographic characteristics; school characteristics; family composition; Child Health Utility (CHU-9D) health status measure; the Good Childhood Index (subjective wellbeing)) are in the anticipated directions and of magnitudes in line with expectations. Associations between variables will be investigated using chi-squared tests (for categorical variables) or one-way analysis of variance (for continuous variables), focusing on the direction and magnitude of associations as well as on p-values. **Results:** The survey was completed between October and November 2022. The sample (n=1,611) has an approximately equal number of children by year of age (25% aged 11, 21% aged 12, 18% aged 13, 19% aged 14, 17% aged 15), an approximate 50/50 split of boys (52%) and girls (48%) and the majority of CYP respondents self-reported being in very good or good health. The majority of responses across the capability levels suggest high levels of capability for all ICECAP-CYP:11-15 attributes. *Physical safety* reported top capability level (69%) more than other attributes. *Learning and experiencing* (52%) and *Emotional security* (54%) reported top level the least compared to other attributes. Preliminary results suggest that ICECAP-CYP:11-15 responses reflect anticipated differences across different socio-economic, health and general wellbeing groups. Validation analysis of associations is ongoing. **Discussion:** Full findings from the survey will be presented at the conference. The new measure is intended to provide information for decisions about resource allocation across health and care interventions. This work provides early evidence for the construct validity of the ICECAP-CYP:11-15 and therefore provides some support for its use in funding decision making. Valuation work will need to be undertaken with this measure to enable its use in economic evaluation.

8:30 AM –10:00 AM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Dahlia

Economics of Cancer Treatment

MODERATOR: **Fadima YAYA BOCOUM**,

Ind-1565 Micro-Costing Analysis of Childhood Hodgkin Lymphoma Treatment in the United States (US): Stratification by Risk and Resources Using ARIA Guidelines

PRESENTER: **Sahar Aliabadi**
AUTHORS: Jennifer L. Pauley, Nickhill Bhakta, Yutaka Yasui, Meagan Norton, John T. Lucas, Hannah Sauer, Priyadarshini Kumar, Nancy S. Bolous

Background: Childhood classical Hodgkin Lymphoma (cHL) is a curable cancer accounting for 40-45% of pediatric lymphomas. Multimodal therapy consisting of immunotherapy, cytotoxic chemotherapy and radiation, is critical for optimal survival but remains inaccessible in many global settings. To address these disparities, the Adapted Resource and Implementation Application (ARIA) guidelines were developed to provide resource-adapted, evidence-based recommendations for childhood cancer treatment worldwide. To ensure the successful real-world implementation of these guidelines and support investments towards improving Hodgkin lymphoma therapy, measuring economic costs is crucial to optimize resource allocation, deliver cost-effective care, and reduce barriers to equitable treatment. This study conducts a micro-costing analysis of cHL treatment using the US healthcare payer perspective, stratified by clinical risk groups and ARIA-defined resource-based strata (A-E) to evaluate cost variations based on therapeutic access.

Methods: A micro-costing framework was developed in consultation with a multidisciplinary expert panel. Unit costs in 2024 USD were retrieved from Centers for Medicare and Medicaid Services (outpatient visits, imaging, laboratory, surgery, and radiotherapy); IQVIA (chemotherapy); and St. Jude Children's Research Hospital (pathology). Costs for each phase of cHL treatment (pre-treatment, treatment, and 5-year follow-up) were estimated based on total costs calculated across ARIA-defined risk groups and resource-based strata. Stratum D represented the standard of care; strata C-E assumed access to radiotherapy; stratum B included access to CT imaging but no radiotherapy; and stratum A had no access to CT or radiotherapy. Stratum E mirrored stratum D but substituted vincristine with brentuximab, a novel

immunotherapy. ‘Essential Treatment’ included outpatient services, laboratory tests, imaging, surgery, and chemotherapy, while ‘Essential+Recommended Treatment’ incorporated additional value-additive laboratory tests and imaging.

Results: Total costs of cHL per patient from diagnosis to the end of the 5-year follow-up, varied by 20-fold, from $9,189 for minimum required testing and treatment to $190,009 for the most resource-intensive option. Analyzed by treatment phase: 1)Pre-treatment costs were consistent for ‘Essential Tests’ ($709) but varied for ‘Essential+Recommended Tests’ ($1,266–$1,533); 2)Treatment costs increased with risk level and resource-based stratum, ranging from $4,920–178,894 for ‘Essential Treatment’ and $5,213–179,187 for ‘Essential+Recommended Treatment’. Substituting vincristine with brentuximab in stratum E increased chemotherapy costs dramatically: low-risk, $2,004 (stratum D) to $73,791 (stratum E); intermediate-risk, $4,184–$123,691; and high-risk, $6,281–$173,592. Radiotherapy costs ranged from $3,318–$5,023 for three-dimensional conformal radiation therapy, volumetric-modulated arc therapy, and proton beam therapy; and 3)Follow-up costs totalled $3,691 over five years, regardless of the risk group and stratum.

Conclusion: This micro-costing analysis provides an initial understanding of cost variations across risk groups and therapeutic approaches within a single healthcare system. While prices vary globally, incorporating this heterogeneity is essential for broader applicability. Notably, the overall costs in this study are modest, but incorporating novel FDA-approved immunotherapies, like brentuximab, significantly increased costs. The methodology developed here provides a robust, scalable, and customizable framework for conducting future adaptive health technology assessments across diverse global settings and cancer types. It aims to support universal health coverage and informed health system investment decisions, paving the way for equitable healthcare access and improved policymaking.

Ind-1184 Estimating the Treatment Cost of Colon Cancer in a Tertiary Academic Hospital in the Western Cape, South Africa

PRESENTER: **Kelechi Nnene**
AUTHORS: Bhavesh Nagar, Claire Warden, Jennifer Moodley, Lucy Cunnama, John Ele-Ojo Ataguba, Adam Boutall

Background: Despite the availability of reliable screening methods and effective treatment options, colon cancer continues to impose a significant burden of morbidity, mortality, and economic costs globally. In South Africa, colon cancer has an age-standardized incidence rate of 6.8 per 100,000 and a mortality rate of 6.3 per 100,000, resulting in an estimated mortality-to-incidence ratio exceeding 0.9. This ratio highlights alarmingly poor treatment outcomes relative to colon cancer incidence in the country. To address this, urgent public health measures are needed to improve treatment outcomes. Costing studies can be leveraged to understand the treatment cost burden for colon cancer, providing crucial insights for allocating resources to finance such measures. Despite this, there is a shortage of relevant information on the treatment cost of colon cancer in South Africa.

Aim: This study aimed to assess the treatment options and stage-specific cost of colon cancer treatment from the perspective of healthcare providers at a tertiary academic health facility in South Africa.

Method: The study employed an ingredient-based guideline approach to evaluate colon cancer treatment components and stage-specific costs at the colorectal cancer clinic and combined colorectal oncology unit of Groote Schuur Hospital. The costing process involved two steps: first, treatment options were defined based on the facility’s colon cancer treatment protocol and linked to relevant resource inputs for each cancer stage through expert interviews. Second, a bottom-up costing approach was used to estimate and aggregate total per-patient guideline costs across treatment components for each stage. Resource inputs considered in the cost estimation included the cost of personnel directly involved in patient care, building space used, equipment and procedure specific to each treatment, relevant consumables and pharmaceuticals. All capital items were annuitised using a 3% discount rate. A one-way sensitivity analysis was conducted to address uncertainties, focusing on post-surgical inpatient admissions and staff categories. All costs are presented in 2024 South African Rands (ZAR) and United States Dollars (USD).

Results: Colon cancer treatment components include staging and risk assessment investigations, clinical consultations, surgery and chemotherapy. The estimated guideline-based per-patient costs for treatment are R60,156 ($3,216) for stages I, R67,644($3,617) and II, R75,132 ($4,017) for stage III, and R171,935 ($9,193) for stage IV. Surgical treatment represents a major cost driver, with additional expenses from inpatient admissions following surgery. Sensitivity analysis indicates that reducing postoperative inpatient stay by 50% lowers the treatment cost by approximately 10% across all stages.

Conclusion: Colon cancer treatment costs are significant and increase as the cancer advances. To mitigate these rising costs and reduce the healthcare burden, policymakers and healthcare providers should prioritise early detection through routine screening programs. By identifying and treating colon cancer at its earliest stages, it is possible to reduce the need for more invasive and costly interventions.

Ind-1097 Cost-Effectiveness Analysis of Pembrolizumab for Resected Stage III Melanoma from an Australian Healthcare System Perspective

PRESENTER: **Rashidul Alam Alam Mahumud**, University of Sydney

Aims: This study evaluates the cost-effectiveness of adjuvant pembrolizumab versus standard care after complete resection of high-risk stage III melanoma with lymph node involvement. Building on international evidence, we contextualise this assessment for the Australian healthcare system, aiming to inform decision-makers on the value of pembrolizumab in reducing melanoma recurrence and improving patient outcomes.
Materials and Methods: A Markov cohort model with four health states (recurrence-free, locoregional recurrence, distant metastases, and death) was used to estimate lifetime costs, life-years, and quality-adjusted life-years (QALYs) for patients treated with pembrolizumab compared to standard care. Transition probabilities were informed by the KEYNOTE-054 trial (NCT02362594) and adapted using Australian-specific data to reflect the local population and clinical practice. Health state utilities and adverse event disutilities were sourced from KEYNOTE-054 and a meta-analysis on melanoma patients. Costs were adjusted to the Australian context for drug acquisition, administration,

adverse events, disease management, and terminal care. A lifetime horizon was used, with costs reported in 2024 AUD. Deterministic and probabilistic sensitivity analyses assessed model robustness and the stability of results under varying assumptions and input values. **Results:** Over the lifetime horizon, adjuvant pembrolizumab yielded 8.59 QALYs and 11.28 life-years, compared to 6.37 QALYs and 8.19 life-years for standard care. The incremental cost-effectiveness ratio (ICER) was $36,200/QALY, falling well below Australia's willingness-to-pay (WTP) threshold of $50,000/QALY. Deterministic sensitivity analyses revealed pembrolizumab remained cost-effective across a range of parameter values, with ICERs varying between $12,000 and $46,000/QALY depending on inputs for drug costs, transition probabilities, and utility values. Probabilistic sensitivity analysis confirmed cost-effectiveness in 93% of simulations, providing robust support for pembrolizumab as a valuable intervention in adjuvant melanoma treatment. **Conclusions:** In the Australian healthcare system, pembrolizumab represents a cost-effective adjuvant therapy for high-risk stage III melanoma following complete resection, providing substantial improvements in survival and quality of life over observation alone. With an ICER well within Australia's WTP threshold, this study supports pembrolizumab's inclusion in funded treatment options for melanoma, aligning with national goals of enhancing cancer care access and improving patient outcomes. Future research should explore long-term impacts as real-world data becomes available to further confirm pembrolizumab's value in the Australian setting.
Keywords: Cost-effectiveness, pembrolizumab, melanoma, adjuvant therapy, Australian healthcare, Markov model, quality-adjusted life years

Ind-337 Impact of Immature Efficacy Data on the Economic Evaluation of Innovative Drugs for Rare Cancer: A Case Study of Intrahepatic Cholangiocarcinoma

PRESENTER: **Yi-Wen Tsai**, National Yang Ming Chiao Tung University
AUTHORS: Chen-Han Chueh, Yu-Wen Wen, Nai-Jung Chiang, Ming-Huan Chen, Hao-Min Cheng

Background: Early approvals of innovative treatments for rare cancers can improve patient access to new therapies but also introduce uncertainties in reimbursement decisions due to limited evidence. The U.S. FDA approved pemigatinib (2020) and futibatinib (2023) for advanced intrahepatic cholangiocarcinoma (aICC) with *FGFR2* fusions/rearrangements, based on early results of phase II trials. In 2023, Taiwan's National Health Insurance Administration (NHIA) began reimbursing pemigatinib for this indication.

Objectives: To conduct a head-to-head economic evaluation of futibatinib versus pemigatinib as second-line treatments for aICC with *FGFR2* fusions/rearrangements, comparing early efficacy data with final trial results published in 2024.

Methods: Three-state partitioned survival models were developed for a lifetime simulation, using progression-free and overall survival data from the FOENIX-CCA2 (2023, 2024) and FIGHT-202 (2020, 2024) trials. The hypothesized futibatinib price was derived from the listing pemigatinib price (13.5 mg at NT$12,500), adjusted based on the UK price ratios of the two medicines. Utility, disutility, and aICC-related costs were sourced from the literature. The willingness-to-pay threshold was set at three times the 2023 GDP per capita (NT$3,023,055), with a 3% discount rate applied to quality-adjusted life-years (QALYs) and costs. Scenario analyses examine variations caused by efficacy, treatment duration, costs, and adverse event assumptions. A cost-minimization analysis was conducted, assuming non-inferiority of the two FGFR inhibitors. Deterministic and probabilistic sensitivity analyses explored the uncertainty associated with the parameters.

Results: Economic evaluation results differed between early and final efficacy data from pivotal trials. Early data showed futibatinib incurred an additional cost of NT$116,147 and a gain of 0.17 QALYs, yielding a positive incremental net monetary benefit (INMB) of NT$7,022 and a 54.8% probability of cost-effectiveness. In contrast, the final data indicated an added cost of NT$88,982 with a QALY reduction of -0.45, resulting in a negative INMB of -NT$1,443,189 and a 10.0% probability of cost-effectiveness. According to the final data, cost-effectiveness could only be achieved if the futibatinib price was reduced by over 80%. In a cost-minimization analysis assuming non-inferiority, a 5% price reduction could result in a 59.3% probability of futibatinib being cost-saving.

Conclusions: Contrary to the economic evaluation results based on immature data, updated analysis using mature trial data indicates that futibatinib is not cost-effective as a second-line therapy for aICC with *FGFR2* fusions/rearrangements without a significant price reduction.

Ind-789 Health Economic Evaluation of Drug Therapies Among Individuals With High-risk Clonal Haematopoiesis

PRESENTER: **Nhung Nghiem**
AUTHOR: Mark Polizzotto

Objectives

Clonal haematopoiesis (CH) is among the major causes of age-related diseases, such as blood cancers and cardiovascular diseases (CVD). Fortunately, molecular testing has allowed individuals at high risk of CH to be identified, and epigenetic therapies can be applied to restore normal haematopoietic stem cell function and prevent CH's complications (CVD and all-cause mortality). This study aims to model and compare long-term health outcomes and the cost-effectiveness of various drug therapies targeting CVD and cancers in Australia.

Methods

We employ a Markov cohort model to simulate the Australian population aged 50+ until death or age 110, whichever comes first. We include CVD and all-cause mortality in the model. A health system perspective is used to estimate individual health costs. We use a 3% discount rate in the primary analysis and 0%, 5% and 6% for sensitivity analysis. We evaluate the cost-effectiveness of three classes of interventions, including targeted inhibitors, epigenetic modifiers, and anti-inflammatory agents. In particular, we model five interventions decitabine+tetrahydrouridine (DAC+THU), IDH1 inhibitor (Ivosidenib), colchicine, and canakinumab in the analysis for three diseases: acute myeloid leukemia (AML), myelodysplastic, and CVD. Of note is that the intervention effect sizes for the DAC+THU are hypothetical, as clinical trial results have not been available. Uncertainties on disease and cost parameters are captured in the model. Multiple time horizons are also conducted to inform

policy decision-making, including 2 years (for within-trial analysis), 5 years, 10 years, 20 years, 30 years and 60 years (the end of modelled population cohort).

Results

The most cost-effective CH intervention is expected to be canakinumab, with the highest quality-adjusted life year (QALYs) and lowest incremental cost-effectiveness ratio (ICER). The largest QALYs gain was due to the significant effect size in CVD prevention (30%). We will evaluate cost-effectiveness by sub-group, in particular age, sex, and disease risk. We will present the QALYs gain and costs in the years after the intervention (such as 96 weeks, 10 years and 60 years). We will also present the sensitivity analysis results with and without long-term health outcomes for CVD and all-cause mortality. Whether the sensitivity analyses change the conclusion of this study (for instance, if it is still cost-effective or the same by sub-group) will also be provided.

Discussion and Conclusions

We estimate that all the CH therapies are potentially cost-effective when long-term health outcomes are included in the model. As most of the health gain was due to preventing CVD, this has a huge public health implication in a high-income country setting with a large burden on non-communicable diseases. This is a world-first health economic evaluation for CH with long-term health outcomes – a randomised clinical trial is on the way, coordinated by our team. We will update the modelling with intervention effect sizes informed by clinical trials in CH interventions. Our results will help guide public health policies to prevent CVD and cancers among individuals with high-risk clonal haematopoiesis. 2

8:30 AM –10:00 AM TUESDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Executive Room 2

Health Insurance and Access to Care

MODERATOR: **Olukorede Abiona**,

Ind-2218 Advancing Universal Health Coverage in Nigeria: Assessing the Effectiveness of the Implementation of Basic Health Care Provision Funds

PRESENTER: **Uchenna Ezenwaka**, University of Nigeria
AUTHORS: Simeon Onyemaechi, Obinna Onwujekwe

Background: Nigeria's progress towards UHC is hindered by inadequate health financing (with out-of-pocket expenditure for health at 70%), exacerbating health disparities, and poor access to healthcare leading to poor health indices. In response to the poor health outcomes, the Nigerian government launched a novel health financing mechanism, 'the Basic Health Care Provisions Funds (BHCPF)' to address health disparities and provide equitable, quality, and sustainable healthcare services to all citizens. Implementation of BHCPF commences in 2021 in all the Nigerian states. However, there is a gap in knowledge on whether BHCPF has improved utilization and access to essential health services (EHS). The study aims to assess the effectiveness of BHCPF implementation in Nigeria and its implications for UHC. **Methods:** A mixed-methods approach combining quantitative (BHCPF utilization data) and qualitative data (key informant interviews, n=30 and FGDs, n=24) was conducted in Anambra State, Nigeria. The interviews were conducted with state and local government health authorities, and stakeholders at the implementation facilities levels were randomly selected across the state. Univariate and linear regression analysis was performed for quantitative data, while qualitative data were analyzed using a thematic content approach. **Results:** The study reveals a significant increase in BHCPF beneficiaries, with a compound annual growth rate (CAGR) of 46% over 2021 to 2023, and a highly significant positive coefficient ($R^2 = 0.998$; $p < .001$) between the time and beneficiary growth. The program increased utilization and access to EHS, reduced out-of-pocket expenses, and enhanced healthcare infrastructure by implementing primary health centres. The utilization of EHS services exceeded 100% annually indicating substantial demand. Access and quality EHS improved tremendously due to the availability of essential medicines and laboratory services, prompt referrals, and extended facility opening hours. The effectiveness of BHCPF implementation was largely driven by the National government's financial commitment, existence and compliance with the operational guidelines and availability of essential medicines. Conversely, several political, institutional and economic challenges limit effective BHCPF implementation. These include exclusion of LGA stakeholders in funds allocation, information asymmetry about BHCFP, inadequate number and skill mix of health workers at the implementing facilities, non-use of injection for treatment policy, lack of incentives and funds community sensitization and monitoring and non-payment of counterpart funds by the Sub-national governments. **Conclusion/Discussion:** BHCPF demonstrates potential in advancing UHC in Nigeria. Effective implementation, addressing identified challenges, and scaling up the program can significantly improve health outcomes and reduce financial hardship. The study contributes to the understanding of innovative health financing mechanisms in low- and middle-income countries, providing valuable lessons for policymakers and stakeholders.

Ind-2512 Ten Years of Indonesia's National Health Insurance and the Urgency of Measuring Effective Coverage: Evidence from NCD Care Cascade Analysis

PRESENTER: **Farizal Rizky Muharram**

Background: Over the past decade, Indonesia's National Health Insurance (NHI) program has aimed to improve healthcare access and utilization. While evidence indicates increased use of healthcare services, the extent to which this has translated into measurable health benefits —referred to as "effective coverage"—remains unclear. This study aims to evaluate the impact of NHI on effective coverage, using non-communicable diseases (NCDs) as a proxy for performance quality. The analysis focuses on the hypertension care cascade—diagnosis, treatment, and control—as a critical indicator of the health system's ability to address the rising NCD burden.

Methods: We analyzed data from three waves of the Indonesian National Health Research (RISKESDAS and SKI) conducted in 2013, 2018, and 2023. Data from 2013 serve as the baseline prior to NHI implementation, while 2018 and 2023 data evaluate its impact. The hypertension care cascade was assessed by measuring the proportion of the hypertensive population who were (1) aware of their condition (diagnosed), (2) receiving treatment (treated), and (3) achieving controlled blood pressure based on standard thresholds (controlled). Both descriptive statistics were used to analyze trends across the three survey years, and multivariate logistic regression was performed to explore associations between care cascade outcomes and sociodemographic factors, including insurance coverage, wealth quintile, and urban-rural residence.

Results and Discussion: Along the care cascade (**Figure 1**), Thanks to the implementation of NHI in 2014, Hypertension treatment rates more than doubled, increasing from **11.1% in 2013** to **21% in 2018** and **22.8% in 2023,** representing an additional 10 million individuals receiving care within a decade. However, control rates showed minimal improvement, only rising from 2.5% in 2013 to 4.4% in 2023, leaving over 95% of hypertensive individuals uncontrolled in 2023. This gap between treatment and control highlights systemic challenges in translating access to care into effective coverage. While NHI reduced wealth-based disparities in treatment **(Figure 2)**, the wealthiest quintile still had 1.75 times higher odds of receiving treatment (AOR: 1.75; 95% CI: 1.68–1.81) and 1.91 times higher odds of achieving control (AOR: 1.91; 95% CI: 1.78–2.05) compared to the poorest quintile in 2023. Urban populations outperformed rural counterparts in all cascade stages, with urban residents having higher odds of being diagnosed (AOR: 1.23; 95% CI: 1.21–1.26), treated (AOR: 1.26; 95% CI: 1.23–1.28), and controlled (AOR: 1.32; 95% CI: 1.26–1.37). Informal workers, and younger age groups had persistently lower odds across all stages.

Conclusion: Despite substantial improvements in treatment rates driven by NHI expansion, control rates that represent quality of care remain critically low. A gap in quality in Wealth is also shown. A focus on quality improvement and pushing quality care to underserved subpopulations is vital to achieving equitable care outcomes.

Keywords: Indonesia, National Health Insurance, Non-communicable Diseases, Hypertension, Care Cascade Analysis

Ind-549 Survival Benefits of Extending Insurance Coverage for Innovative Medicine: An Instrumental Variable Analysis in Metastatic Colorectal Cancer

PRESENTER: **Wei-Ming Huang**
AUTHORS: Yi-Wen Tsai, Chiao-En Wu, Chen-Han Chueh, Chien-Yu Tseng

Background: To manage the budget impact of innovative cancer treatments, Taiwan's National Health Insurance Administration (NHIA) often implemented a Predetermined Treatment Duration Limit (PTDL) policy, capping reimbursement for high-cost medicines. While international guidelines recommend bevacizumab as targeted therapy for metastatic colorectal cancer (mCRC), the PTDL limited its reimbursed duration to 24 weeks since June 1, 2011, later extending this to 36 weeks on April 1, 2017.

Objectives: This study aims to evaluate whether extending the reimbursed duration of bevacizumab treatment under the NHIA's PTDL policy improves survival outcomes for patients with mCRC.

Methods: This population-based cohort study used the Taiwan Health and Welfare Database to identify two patient cohorts with metastatic colorectal cancer (mCRC) based on initial bevacizumab prescription date: a 24-week cohort (April 1, 2013–March 31, 2016; N = 2,051) and a 36-week cohort (April 1, 2017–March 31, 2020; N = 2,484). Patients were followed for up to two years or until death. We estimated the PTDL policy's effect using a doubly robust approach, first applying inverse probability of treatment weighting (IPTW) based on propensity scores from demographic, disease, and treatment covariates. We then used a weighted Cox proportional hazards model to estimate the hazard ratio (HR) for all-cause mortality. Additionally, a two-stage residual inclusion (2SRI) model, using PTDL as an instrumental variable, assessed the impact of extended treatment cycles on mortality, adjusting for cohort effects by calendar year.

Results: After applying IPTW adjustment, no significant differences were observed in covariates between the cohorts. Overall, the extended PTDL policy was linked to a reduced hazard of all-cause mortality (HR: 0.74, 95% CI: 0.68–0.81), even after adjusting for calendar year effects (HR: 0.83, 95% CI: 0.71–0.96). Additionally, the extended PTDL policy significantly increased the duration of bevacizumab treatment, averaging an additional 4.20 cycles (two weeks per cycle). The estimation from 2SRI indicated that this increased treatment duration was significantly associated with improved survival outcomes, with an HR of 0.91 (95% CI: 0.89–0.93).

Conclusion: Our findings indicate that modifying the PTDL for bevacizumab improved overall survival in patients with mCRC, primarily due to extended treatment duration. This study highlights the need for evidence-based PTDL policy design that meets financial management objectives without compromising patient health outcomes.

Ind-2612 The Effect of Health Insurance on Risk Aversion

PRESENTER: **Anastasia Terskaya**, University of Barcelona

Understanding the determinants of risk preferences is essential as they influence significant economic and social decisions. This study examines the impact of Medicare, the U.S. public health insurance program for those aged 65 and above, on individual risk preferences. Employing a regression discontinuity design around the age 65 eligibility threshold and using data from the Health and Retirement Study (HRS), we find that Medicare enrollment significantly reduces risk aversion. The observed effect is consistent with the concept of risk vulnerability, which posits that reduced background financial risks, such as those associated with healthcare costs, lead to greater risk tolerance.

Our analysis highlights that this change in risk preferences has a minimal influence on health-related behaviors but a substantial effect on financial decision-making, notably an increase in stockholding. The results suggest that Medicare reduces perceived economic uncertainty,

indirectly fostering economic growth through increased financial engagement among older adults. The findings underscore the broader implications of public health insurance policies, suggesting that they not only improve health outcomes but also shape economic behavior by altering risk preferences.

By leveraging detailed income gamble data from the HRS, we measure changes in risk aversion and assess the role of Medicare enrollment. The fuzzy regression discontinuity approach reveals that gaining Medicare coverage decreases risk aversion by approximately 0.4 standard deviation points. However, only a small proportion of the increased stockholding behavior is mediated by changes in risk preferences, indicating that other factors also contribute to this financial behavior.

Robustness checks confirm the validity of our findings. These include balance tests across demographic characteristics, placebo tests using pre-eligibility data, and McCrary density tests to ensure the continuity of the sample around the age cutoff. The results suggest that selection bias or pre-existing differences between eligible and non-eligible individuals are unlikely to drive the observed effects.

In conclusion, this study demonstrates that public health insurance significantly impacts economic behavior by reducing risk aversion. These insights expand the understanding of the economic value of health insurance, emphasizing its role in promoting financial risk-taking and supporting economic growth. Future research should explore the long-term implications of these behavioral shifts and their variation across different demographic groups and policy environments.

Ind-1374 Mental Healthcare and the Labour Market: Quantifying the Impact of Accessing Psychologist and Social Worker Care on Absenteeism

PRESENTER: **Casey Chu**
AUTHOR: Claire de Oliveira

Background: Poor mental health is increasingly recognized as a critical contributor to workplace absenteeism, a major component of lost productivity. This recognition emphasizes the need to address mental health challenges among workers. While workplace programs supporting employee mental health show the potential to mitigate absenteeism, the impact of accessing mental health services beyond workplace programs remains uncertain. Studies have also primarily examined physician-delivered services, overlooking the crucial role of non-physician mental health practitioners such as psychologists and social workers. **Question:** How does access to mental healthcare (especially through psychologists and social workers) impact workplace absenteeism among workers in Ontario, Canada, with mood and/or anxiety disorders? **Methods:** The analysis used several cycles (from 2007 to 2016) of the Canadian Community Health Survey (CCHS), a cross-sectional national survey. We applied a pseudo-panel framework to examine longitudinal trends in cohorts of workers; this was done by constructing cohorts of workers sharing age and sex. The sample included employed, working-aged individuals (25-64 years old) in Ontario with a self-reported mood and/or anxiety disorder. The outcome variable was being absent from work in the past week. The exposure variables include consulting with a mental health provider (including psychologists, social workers, nurses, family physicians and psychiatrists), a specialist (psychologist or psychiatrist), a physician (family physician and/or psychiatrist), or a non-physician (psychologist or social worker) for mental health reasons in the past year, as well as the number of times any mental health provider was consulted. The exposures were also lagged by one year to examine the impact of accessing care two years prior. Pooled and two-way fixed effects linear probability models were used to estimate the relationship between the exposure and outcome, while controlling for relevant sociodemographic and health-related factors. **Results:**Among cohorts of individuals with mood and/or anxiety disorder, seeing both a family doctor and psychiatrist in the past year had a higher probability of absence. In contrast, seeing a psychologist two years ago was associated with a lower probability of absence, and seeing a non-physician mental health provider two years ago was associated with a lower probability of absence. Lastly, each additional mental health visit two years prior was associated with a reduction in the probability of absence. Other exposures did not show significant associations with absence. **Conclusions:** More frequent visits to mental health providers and access to psychologists or other non-physician mental health professionals may yield substantial long-term reductions in work-related absenteeism among workers with self-reported mood and/or anxiety disorders. However, these benefits appear to emerge only after a delay of two years, highlighting the importance of sustained access to mental health care for improving workplace productivity. Future work will explore presenteeism as an outcome and the generalizability of these findings to other provinces in Canada and samples (e.g., individuals reporting high work stress). **Implications:** Employers and policymakers should consider the potential long-term economic benefits of expanding access to non-physician mental health services, especially in health systems like Ontario, which do not cover such services under public health insurance. More comprehensive coverage for these services could reduce workplace absenteeism. However, the delayed nature of these benefits necessitates sustained investment in mental health support.

Ind-135 Impact of COVID-19 Lockdown on Access to Maternal Health and Nutrition Care Services in Rural India: A Single Interrupted Time-series Analysis

PRESENTER: **Rajesh Kumar Rai**, Society for Health and Demographic Surveillance, India
AUTHORS: Anamitra Barik, Nilanjana Gupta, Sabri Bromage, Sandhya S Kumar, Jan-Walter De Neve, Philip Waggoner, Gopal Krishna Dhali, Abhijit Chowdhury, Utz Johann Pape, Pascal Geldsetzer

The global disruptions in essential healthcare service utilization caused by the Coronavirus Disease 2019 (COVID-19) pandemic lockdowns are well-acknowledged. However, the specific impact of these disruptions on maternal health and nutrition care services within rural India requires further empirical investigation. Utilizing data from 57,371 pregnancies recorded between January 2012 and December 2023, this study employed a quasi-experimental single interrupted time series (SITS) analysis to evaluate the impact of the COVID-19 lockdown (March 25-May 31, 2020) on three key maternal health and nutrition care utilizations: receipt of ≥4 antenatal care visits (ANC), consumption of ≥100 iron-and-folic acid (IFA) tablets/ equivalent syrup, and institutional delivery. The robustness of the findings was further examined by addressing potential threats to internal validity and conducting falsification tests. Of 57,371 pregnancies, 34.5% (95% CI: 34.1, 34.9%) accessed ≥4 ANC visits, 38.7% (38.3, 39.1%) consumed ≥100 IFA tablets/ equivalent syrup, and 87.3% (95% CI: 87.0, 87.5%) had institutional delivery. Between January 2012 and December 2023, relative to the pre-lockdown trend, a decreasing trend in the coverage of ≥4 ANC visits (β: -0.22, 95% CI:

-0.31, -0.12, p< 0.001) and in the coverage of institutional delivery (β: -0.17, 95% CI: -0.21, -0.13, p< 0.001) was observed. The downward trend in the prevalence of ≥100 IFA / equivalence syrup intake was observed (β: -0.58, 95% CI: -0.89, -0.27, p= 0.001) for a narrower time frame of January 2019 to December 2021. The evaluation of internal validity, along with falsification tests, bolstered the robustness of the study findings. In light of the study findings, Indian public health systems must prioritize the integration of maternal health safeguards into pandemic preparedness frameworks.

Ind-1939 Determinants of Socioeconomic Inequality in Hepatocellular Carcinoma Screening in Taiwan, 2016 2021

PRESENTER: **Tan-Hao Yang**
AUTHORS: Li-Lin Liang, Chun-Ying Wu

Introduction

The Asian Pacific Association for the Study of the Liver (APASL) Hepatocellular Carcinoma (HCC) Guidelines recommend ultrasound screening for high-risk populations every six months. However, in Taiwan, approximately 36% of HCC patients did not receive ultrasound screening within five years prior to diagnosis. This study investigates the role of socioeconomic status (SES) in inequalities in HCC screening and identifies factors contributing to this disparity.

Methods

We used data from Taiwan's National Health Insurance Research Database (NHIRD). A total of 53,203 newly diagnosed HCC patients from January 1, 2016, to December 31, 2021, were categorized into six cohorts by year of diagnosis. HCC screening was defined as a binary variable indicating whether patients received screening within six months prior to diagnosis, with a three-month washout period applied. SES was determined by insured salary prior to diagnosis. Inequality was assessed using the Erreygers Concentration Index (ECI). Decomposition analysis was conducted to identify contributing factors, including insured salary, demographic characteristics, medical needs, and attributes of patients' residential townships.

Results

Approximately 65% of HCC patients did not undergo screening within six months prior to diagnosis. From 2016 to 2021, significant pro-rich inequality in HCC screening was observed, with ECI values ranging from 0.038 to 0.063, though no consistent temporal trend was identified. Decomposition of the ECI in 2019 (ECI = 0.039, p-value < 0.001) revealed that the insured salary was the largest contributor to inequality (120.7%), followed by medical needs (29.3%) and unhealthy behaviors (18.3%). In 2021, a similar pattern was observed (ECI = 0.047, p-value < 0.001), with insured salary (136.3%), medical needs (38.6%), and unhealthy behaviors (22.3%) remaining the largest contributors.

Conclusion

Pro-rich inequality in HCC screening persists in Taiwan, with insured salary as the dominant contributing factor. Within medical needs, age was the primary driver of inequality, while smoking and drinking were key contributors among unhealthy behaviors. Comparatively, Taiwan's National Health Insurance system demonstrates better performance in reducing inequality compared to studies of other cancer screenings in countries like England, Korea, and Spain, where ECI values range from 0.13 to 0.18. However, the persistent pro-rich pattern and the fact that 65% of HCC patients did not undergo timely screening highlight areas for improvement. Policymakers should implement targeted screening initiatives for elderly populations and enhance health literacy and behavior change programs among low-income groups. These efforts could reduce the socioeconomic disparities in HCC screening and improve early detection rates.

Ind-2282 The Long-Run Impact of Primary Education on Women's Late-Life Cognitive Function in India

PRESENTER: **Nathalie Monnet**
AUTHORS: Mauricio Avendano, Clémence Kieny

The global population is aging rapidly, leading to a sharp increase in the number of older adults affected by cognitive impairment and dementia (Ahmadi-Abhari et al., 2017). As pharmacological interventions for dementia remain limited, preventive measures targeting social determinants of health, and education in particular, have gained prominence.

Natural experiments, particularly those examining compulsory schooling reforms, provide robust evidence of the positive causal impact of education on cognitive health (Banks & Mazzonna, 2012; Glymour et al., 2008). Education may enhance cognitive reserve, delaying the onset of cognitive decline and functional impairment. Additionally, it may influence cognition indirectly by enabling access to better jobs, higher earnings, and healthier lifestyles, all of which contribute to reduced risk of cognitive impairment and dementia. While most of the literature focuses mainly on upper secondary education in high-income countries, the cognitive benefits of primary education remain underexplored, especially in low- and middle-income countries, where the majority of older adults will be living in future decades.

Moreover, in developing countries, gender disparities in education remain pronounced. Despite recent progress, girls continue to lag behind boys in educational outcomes, with UNESCO reporting that 132 million girls worldwide still lack access to education (UNESCO, 2021). In India, the female literacy rate remains significantly lower than that of males (70.3% vs. 84.7%, National Survey of India, 2022), which has been shown to have a negative association with cognitive outcomes (Brucki, 2010).

These disparities have far-reaching implications for cognitive health. Prior research in India has documented a considerable gender gap in cognitive function, driven largely by educational attainment, health status, and social participation (Lee et al., 2014). Understanding how gender

inequality in education impacts cognitive health in older age is crucial, particularly for low-income women, who are disproportionately affected by these disparities.

This study investigates the causal impact of primary education on cognitive function in old age. We focus on women from a poor socioeconomic background because they are more likely to have benefited from compulsory schooling laws than girls from a higher socioeconomic background, or boys. Compulsory schooling laws are believed to have played a crucial role in improving education access for girls, mandating that all children, regardless of gender, attend school up to a certain age. We leverage data from the first wave of the Longitudinal Ageing Study in India (LASI) (2017-2021) and employ an instrumental variable approach to analyze the effects of historical compulsory schooling reforms. Our findings suggest that compulsory school laws increased schooling duration, which in turn significantly enhanced long-term cognitive function among women growing up poor. These results underscore the critical role of primary education in preventing cognitive decline, and the urgent need to address gender disparities in access.

8:30 AM –10:00 AM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Denpasar A

Economic Evaluation of Communicable Disease Interventions

MODERATOR: **Naomi van der Linden**,

Ind-33 Cost-Effectiveness of a Health Insurance Scheme for Women and Girls in Transactional Sex and HIV Transmission in Cameroon: A Mathematical Model

PRESENTER: **Kasim Allel**, Centre for Global Health Economics, UCL
AUTHORS: Tamoufe Ubald, Serge Billong, Henry Cust, Emilemichel Nitcheu, Iliassou Mfochive-njindam, Julienne Noo, Eric Defo Tamgno, Sandie Szawlowski, Aurelia Lepine

Introduction: HIV prevalence disproportionately affects high-risk populations, particularly sex workers. However, interventions primarily target commercial sex workers, often overlooking women and girls engaging in transactional sex (WGTS) who also face significant risks due to unsafe practices and societal vulnerabilities but lack formal healthcare protection.

Methods: Using existing literature and the POWER randomised controlled trial, we developed a deterministic compartmental model to assess HIV dynamics among WGTS, their sugar daddies, and low-risk female and male populations (age 15-64 years). We evaluated the cost-effectiveness of a national health insurance scheme for WGTS in Cameroon across various coverage levels (0%, 25%, 50%, 75%, and 100%). We calculated the incremental cost-effectiveness ratio (ICER) per disability-adjusted life year (DALY) and HIV-infections averted. We employed univariable (across most relevant parameters) and global sensitivity analyses by varying parameters in the range of +-10% of their original values. Global sensitivity analyses were performed using the Latin hypercube sampling method with 1,000 simulations and we computed the Spearman's partial rank correlation coefficient (PRCC) to indicate parameters' influence. Probabilistic sensitivity analyses (PSA) considered all parameters simultaneously comparing simulated ICERs to willingness-to-pay (WTP) thresholds. Bivariable sensitivity analysis examined variations in health insurance coverage and its efficiency for a target portfolio. Scenario analyses included combinations of PrEP and health insurance coverage for dual application at scale. We used 2023£ and a 3% discount rate.

Results: Implementing insurance coverage levels of 25%, 50%, 75%, and 100% yielded ICERs per DALY averted of £2,795 (£2,483—£2,824), £2,541 (£2,370—£2,592), £2,263 (£2,156—£2,316), and £1,952 (£1,891—£1,998), respectively, versus a 0% coverage baseline. Probabilistic sensitivity analysis indicated an ICER of £2,128 per DALY averted at 100% coverage, with 58% of simulations showing ICERs

Interpretation: A comprehensive health insurance scheme for WGTS in Cameroon could significantly reduce HIV infections and DALYs, especially at higher coverage levels. This highlights the need for targeted healthcare policies for marginalised groups. Broad, inclusive healthcare policies could drastically lower HIV rates and improve public health, supporting progress toward Sustainable Development Goal 3.8 and the WHO's 95-95-95 targets for universal health coverage and HIV control in Cameroon.

Ind-438 Cost-Effectiveness of Tenofovir Disoproxil Fumarate Prophylaxis for Perinatal Hepatitis B Virus Prevention in Ethiopia

PRESENTER: **Abdi Gari**
AUTHORS: Negalign Bayou, Firew Bobo, Temesgen Chala

ABSTRACT

Background: Mother-to-child transmission (MTCT) of Hepatitis B Virus (HBV) is a persistent public health concern. The prevalence of HBV among pregnant women in Ethiopia is notably high, putting thousands of children at risk for MTCT. Tenofovir Disoproxil Fumarate (TDF) prophylaxis is recommended for HBV-infected pregnant women in addition to vaccination. However, the cost-effectiveness of adding TDF

prophylaxis remains unknown in Ethiopia. We aim to identify a cost-effective strategy for adding TDF prophylaxis to prevent perinatal transmission of HBV in Ethiopia.

Methods: A Decision Tree combined with a Markov model was used to determine the cost-effectiveness of different strategies for preventing perinatal transmission of HBV in Hepatitis B surface Antigen (HBsAg) positive pregnant women. We compared the existing Hepatitis B vaccination strategy (*Strategy 1*), with three alternative strategies that added TDF to the existing strategy. *Strategy 2* (TDF prophylaxis for high viral load pregnant women following HBV viral load test), *Strategy 3* (TDF prophylaxis for Hepatitis B envelope Antigen (HBeAg) positive pregnant women following HBeAg test), and *Strategy 4* (TDF prophylaxis for all HBsAg-positive). Costs were measured from provider perspective and adjusted to 2024 USD. Effects were measured as HBV infections and DALYs averted. Model input parameters were from the literature review and local data. Cost-effectiveness was determined by Incremental Cost-Effectiveness Ratio (ICER), using a threshold of multiplies (0.34, 1, and 3) of GDP per capita of Ethiopia. Sensitivity analysis was conducted to test the robustness of the result.

Results: Among the alternatives, *Strategy 4* is the most cost-effective strategy with an ICER of 220.3 USD per DALYs averted. *Strategy 4* would prevent 267 perinatal HBV infections and averts 1048 DALYs per 10,000 HBsAg-positive pregnant mothers. This result were robust to a range of input parameters and has 97% probability of being cost-effective at one times GDP per capita of Ethiopia. The next optimal strategy is *Strategy 2*, with an ICER of 1175.52 USD per DALYs averted. *Strategy 3* was dominated by the available strategies.

Conclusion: Providing TDF prophylaxis for all HBsAg-positive pregnant women starting from 28 weeks of pregnancy has a potential to be a cost-effective strategy in Ethiopia. Introduction of TDF prophylaxis is highly recommended, along with efforts to increase vaccination coverage.

Keywords: Cost-Effectiveness, Mother-to-child transmission, Hepatitis B virus, Tenofovir, Ethiopia

Ind-476 Cost-Effectiveness of Intermittent Preventive Treatment with Dihydroartemisinin-Piperaquine (IPTp-DP) for Malaria in Pregnancy in Papua, Indonesia

PRESENTER: **Firdaus Hafidz**
AUTHORS: Ida Laksanawati, Freis Candrawati, Eve Worrall, Jeanne Rini Poespoprodjo, Reynold Ubra, Temitayo Labor, Jenny Hill, Enny Kenangalem

Background: Malaria in pregnancy is a major risk factor for maternal and neonatal mortality. The prevalence of malaria in pregnancy in Mimika, Papua (17%) represents a substantial health burden. Indonesia's national policy of single screening and treatment with dihydroartemisinin-piperaquine (SST-DP) at the first antenatal care (ANC) visit clears any malaria infections, but leaves women vulnerable to subsequent reinfection. A clinical trial found that IPTp-DP was more cost-effective than SST-DP in Papua however its cost-effectiveness in real-world settings is unknown. Moreover, the Indonesian health system heavily relies on a vertical malaria control programme, and preventive services are not covered by the national health insurance (JKN) benefits package. This study evaluated the societal costs and cost-effectiveness of IPTp-DP in addition to SST-DP in the context of a IPTp-DP pilot through routine ANC by the Ministry of Health in Papua, Indonesia. **Methods**: We employed top-down and bottom-up methods to capture provider and beneficiary costs for IPTp-DP and SST-DP at ten health facilities in Mimika District during the pilot, from February 2022 to November 2023. Provider costs were sourced from facility financial records, covering training, procurement, logistics, and capital investments. Beneficiary costs were gathered through interviews with pregnant women. Health outcome data (malaria incidence, maternal anaemia) were extracted from ANC records and modelled using a decision tree to project pregnancy costs and health outcomes and to calculate incremental cost-effectiveness ratios (ICERs) per DALY averted. The ICERs were compared against three thresholds: WHO-CHOICE (1× GDP per capita, USD 4 731), Pichon-Riviere (USD 1 028) and Ochalek (USD 958). Deterministic and probabilistic sensitivity analyses were conducted to assess model robustness. **Results**: The total annualised-economic cost of IPTp-DP, spanning pre-implementation and two years of implementation, was USD 72,548, comprising 77.1% provider and 22.9% beneficiary costs. The majority of expenses were incurred during the implementation phase year 2, with primarily DP medication, representing a substantial portion of the total cost. Per facility costs ranged from USD 2,871 at Ayuka to USD 11,684 at Timika Jaya, while the cost per course was USD 18.73, and the total cost per woman was USD 35.52 across 5,108 doses. IPTp-DP+SST administered had an ICER of 340.29 per DALY averted, compared to SST alone. **Conclusion**: IPTp-DP+SST currently appears to be cost-effective against all thresholds. However, efforts are still required to identify efficiencies, improve coverage, and optimise the number of courses. National scale-up would necessitate a robust financing plan, prioritising budget allocations and securing sustainable funding.

Ind-561 Incorporating Environmental Considerations Into the Economic Evaluation of FDG-PET/CT for Investigation of Neutropenic Fever in Haematology Patients

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Healthcare accounts for 5.2% of global greenhouse gas emissions, with some countries, like Australia, emitting more than the global average (7%). As nations aim for low-carbon or net-zero carbon healthcare by 2050, it is important to evaluate how healthcare interventions contribute to these goals. Despite the growing emphasis on integrating environmental considerations into health technology assessments and policy decisions to support effective, cost-effective, and environmentally sustainable care, there is a gap in formal guidance on how to evaluate the environmental impacts of new technologies and how such evidence could influence decision-making.

We use a published economic evaluation of a diagnostic technology (18F-fluoro-2-deoxyglucose positron-emission tomography combined with low-dose computer tomography; FDG-PET/CT) as our case study and incorporate environmental impacts (carbon emissions and carbon costs) to understand their implications and how it may impact decision making. The clinical trial and economic evaluation found that FDG-PET/CT is an effective and cost-effective diagnostic tool to support investigations of persistent and recurrent neutropenic fever in high-risk haematology patients compared to standard CT scan, resulting in a reduction in resources used such as biopsies, pathology tests, duration of hospital stay, thus reducing unnecessary care and, potentially, waste production. However, imaging technologies like PET/CT scans are known to have large

carbon footprints.

The carbon emissions of various resources used in the clinical trial (e.g., antimicrobials, blood cultures, diagnostic tests, and hospitalisation duration) were quantified in kilograms CO2 equivalent (kgCO2e) units using data from literature and expert opinion. A process-based life cycle assessment approach was applied to estimate the carbon footprint. The associated cost of emissions was calculated at AUD$56 per tonne of CO2e, based on Australian government carbon valuation guidelines. To compare carbon emissions and costs between two cohorts, nonparametric bootstrap simulations with 1000 replications were used to assess uncertainty levels.

Preliminary results indicated that while the FDG-PET/CT group had a larger carbon footprint from diagnostic imaging resources compared to the standard CT group (28.4 vs. 11.1 kgCO2e), the overall carbon emissions were lower for FDG-PET/CT (933.0 vs. 954.9 kgCO2e), with a small difference of 21.9 kgCO2e (95% CI, -325.2,281.5). The difference in carbon costs between the two groups was also small ($51.2 vs. $52.5), showing a difference of -$2.3 (95% CI, -19.3,14.7). The lower carbon emissions and costs in FDG-PET/CT were primarily driven by shorter hospital stays rather than reductions in other resources. The small impact of carbon costs relative to the high cost of the intervention suggests that integrating environmental considerations into economic evaluations may not significantly affect cost-effectiveness conclusions. However, on a larger scale, especially with high patient volumes, the environmental impact could become substantial and may be an important factor in decision-making.

The study was limited by the lack of standardized data on carbon emissions and addressing these gaps would facilitate the inclusion of environmental considerations in health technology assessments. Further research is needed to understand whether the public values carbon costs the same as the intervention cost and if the current carbon cost valuation reflects the public's opportunity cost of environmental impact.

Ind-576 Comparison of the Performance and Costs of Screening Algorithms Using Rapid Diagnostic Tests for Detection and Treatment of Syphilis

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Background: Accurate and affordable screening algorithms are crucial for managing syphilis from a public health perspective. Syphilis rapid diagnostic tests (RDTs) can support scale-up of same-day diagnosis and enable prompt treatment and care, particularly in resource-limited settings.

Methods: We compared the performance and economic costs of three syphilis RDT-based algorithms from a health system perspective: i) treponemal-only rapid diagnostic test (T–RDT), ii) dual treponemal/non-treponemal rapid diagnostic test (T/NT–RDT) and iii) sequential testing using T–RDT followed by T/NT–RDT. A decision-analytic model employing microsimulation of 100,000 individuals was used to estimate the number of missed and overtreated syphilis cases, as well as the costs per person tested and per active syphilis infection treated. All costs are reported in 2024 United States dollars (USD).

Findings: The T/NT–RDT algorithm showed the lowest proportion of missed cases (0%–3%) compared with the T–RDT (8%–14%) and sequential algorithms (8%–15%) across all scenarios. The T–RDT algorithm resulted in the highest overtreatment rates. At a syphilis background prevalence of <1%, the T–RDT algorithm and sequential algorithm had comparable proportions of missed cases, but the sequential algorithm exhibited significantly reduced overtreatment. The T–RDT algorithm was the most affordable and cost-efficient, with costs ranging from USD 6.07 to USD 2148.24 per active case treated across syphilis prevalence (0 to 20%), compared to the T/NT–RDT (USD 20.07–7150.84) and sequential algorithms (USD 23.76–8540.42). The cost per person tested was USD 1.07–1.09, USD 3.58–3.60, and USD 4.27–4.28 for the T–RDT, T/NT–RDT and sequential algorithms across syphilis prevalence (0 to 20%), respectively.

Interpretation: Countries need to consider the structure, aims and available resources within their syphilis response to prioritize their testing and treatment approaches appropriately. The T–RDT algorithm is the most affordable and cost-effective option for managing syphilis at the population-level. In populations with high background prevalence of syphilis (>1%), such as among men who have sex with men (MSM), the choice of diagnostic algorithm depends on the primary objective. If the goal is to minimise missed cases, the T/NT–RDT algorithm may be a better value for money. Conversely, if the focus is on reducing overtreatment, the sequential screening algorithm may be preferable.

Ind-606 Economic Evaluation of Non-Pharmaceutical Interventions (NPIs) on Influenza and COVID-19 Control: A Systematic Review.

PRESENTER: **Dr. Hui Yee Yeo, PhD**
AUTHORS: Hung Trinh, Nhung Nghiem, Peter McIntyre, Steffen Albrecht, Nikki Turner

Background: The COVID-19 pandemic, along with influenza epidemics and pandemics, has a profound impact on global health and economies. To mitigate these effects, extensive public health interventions, including non-pharmaceutical interventions (NPIs), were implemented. Before the COVID-19 pandemic, the effectiveness of NPIs, such as school shutdowns, sanitization, and mask mandates, was often debated, and robust evidence on their cost-effectiveness remains limited. Given the similarities in transmission patterns and symptoms between COVID-19 and influenza, this study aims to assess and compare existing evidence on the economic evaluation of NPIs for both. By doing so, it seeks to provide valuable insights to guide policymakers toward cost-effective and evidence-based pandemic and epidemic response strategies involving NPIs. **Methods**: A systematic literature search was conducted across five medical databases (PubMed, Scopus, EMBASE, CINAHL, EconLit), four health technology assessment databases (NHS HTA, NHS EED, CRD DARE, INAHTA), reference lists, and cited references. The exhaustive search strategy combined four concepts: "influenza," "COVID-19", "WHO-recommended NPIs", and "economic evaluation", covering each database's inception to June 2024. Only full economic evaluations were selected. Two independent reviewers screened and selected studies for inclusion, and quality was assessed with the Consolidated Health Economic Evaluation Reporting Standards

(CHEERS 2022) checklist. A qualitative narrative synthesis was used due to substantial heterogeneity in study characteristics, comparative periods, and outcome measures. **Results:** Out of 6,453 identified studies, 32 were ultimately included in this review (Influenza: 13; COVID-19: 19). A significant portion of these studies originated from the United States (n=12) and high- or upper-middle-income countries (n=17). For influenza, school closure was the most common NPI evaluated (n=11), followed by social distancing (n=4). For COVID-19, school closure and isolation/quarantine were most common (n=6 each), followed by social distancing, travel restrictions, and face masks (n=5 each). Economic evaluations predominantly utilized cost-effectiveness analysis and cost-benefit analysis (n=9 each). Dynamic modeling (n=13) and agent-based models (n=10) were the primary analytical frameworks employed. The majority of studies were rated as "very good" quality (n=20), with CHEERS scores ranging from 63 to 85.7. Two studies achieved an "excellent" rating with a score above 85, while the remaining were categorized as "moderate" quality, scoring between 55 to 70. Overall, most NPIs demonstrated cost-effectiveness from a societal perspective. However, findings on the cost-effectiveness of school closures and lockdowns were mixed. Combining NPIs with antivirals or vaccination interventions was generally more cost-effective than implementing vaccines or antivirals alone. Sensitivity analyses indicated that most interventions were particularly influenced by factors such as pandemic severity, susceptibility rate, transmissibility, cost of illness, discount rate, and time horizon. **Conclusion:** Most NPIs are more cost-effective than no intervention in mitigating influenza epidemics and pandemics, as well as COVID-19 pandemics, with the greatest cost benefits achieved when NPIs are combined with antiviral and vaccination strategies. However, quality assessment revealed several methodological limitations across studies, suggesting that results should be interpreted with caution. Greater emphasis on NPIs in epidemic and pandemic mitigation strategies for influenza and COVID-19 is warranted. This review offers valuable insights for policymakers, supporting more informed decisions regarding NPI adoption.

Ind-804 How Robust is the Current Evidence on Cost-Effectiveness of Automated Insulin Delivery Systems for People with Type 1 Diabetes? A Systematic Review

PRESENTER: **An Tran-Duy**, The University of Melbourne
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Abstract

Background

Automated insulin delivery (AID) systems, a relatively modern approach for managing type 1 diabetes (T1D), automatically adjust insulin delivery in response to blood glucose levels. Assessing the strengths and weaknesses of current evidence on the cost-effectiveness of AID systems is crucial due to their rapid development. This study systematically reviewed and critically assessed the quality of the economic evaluations (EEs) of AID systems for both children and adults with T1D.

Methods

We searched Medline (Ovid), EMBASE (Ovid), Web of Science, CINAHL, EconLit and Cochrane Library from inception to the 2nd of July, 2024 for studies reporting EEs of AID systems in individuals with T1D. We considered AID systems with any levels of automation, from sensor-augmented pumps with low glucose suspend to hybrid closed loop devices. Two reviewers independently screened the studies and extracted data. Study quality was assessed using the Consensus on Health Economic Criteria (CHEC) checklist, the Consolidated Health Economic Evaluation Reporting Standards (CHEERS) checklist and the Good Practice Guidelines for Decision-Analytic Modelling in Health Technology Assessment (Philips') checklist. For each study, the quality score was calculated as the percentage of checklist questions that received a positive answer.

Results

We identified 7632 unique studies, and from these, 21 studies reporting 42 EEs were included for data extraction and quality assessment. Out of the 42 EEs, 35 used the CORE Diabetes Model for the analysis, 37 were industry-funded, and 37 reported the AID systems being cost-effective compared to multiple daily injections (MDIs) or insulin pumps, with or without glucose monitoring. For EEs reporting the AID systems being more costly but more effective (n = 36), the incremental costs (US$ 2023) per QALY gained ranged from 6,977 to 1,172,355.

Among the 37 EEs reporting the AID systems being cost-effective, five focused exclusively on children, 34 were industry-funded, and 21 used cost-effectiveness thresholds recommended by the guidelines, while 16 used thresholds defined by the authors. The incremental costs ($US 2023) per QALY gained ranged from negative values (i.e., the AID systems were dominant) to US$58,215.

Quality scores from the CHEC checklist varied from 84% to 100% and those from the CHEERS checklist ranged from 71% to 100%, both with a median of 89%. For 20 modelling studies (41 EEs) assessed using the Philips' checklist, overall quality scores ranged from 53% to 70%, with a median of 60%. Notably, 13 studies (21 EEs) scored lower than 50% within the data quality category, which includes 33 questions.

Conclusions

Most of the EEs reported that the AID systems were cost-effective. However, many studies have significant limitations, such as the use of insufficient data for parameter estimation and the lack of model adaptation to the jurisdictional settings. Additionally, most of the EEs depended solely on one model without a structural uncertainty analysis. The fact that most studies were funded by companies producing the AID systems also raises concerns about potential bias. Our findings suggest that decision makers should scrutinize the existing EEs and their limitations to ensure accurate interpretation and application of the results.

Ind-883 The Economic Trends of Inpatient Diabetic Foot Care in a Multi-Ethnic Asian Population: Cost Drivers and Impact of High-Cost Users

PRESENTER: **Chloe Chan**
AUTHORS: Pamela Lim, Diarmuid Murphy, Shikha Kumari, Yaser Hasan Muhammed, Ying-Qiu Dong

Background/Aim: Diabetes mellitus (DM) and diabetes-related complications are a growing health problem with significant global disease burden. In the United States, the estimated direct medical costs associated with diabetes were $176 million in 2012 (2.3 times higher than nondiabetic patients), of which 33% were linked to the treatment of foot ulcers, and majority related to inpatient hospital admissions. Despite diabetic foot complications having disproportionally high healthcare expenditure with inpatient costs accounting for the major cost burden, there is limited data within the Asian context. The aim of this study was to evaluate the costs of inpatient treatment of diabetic foot complications with a focus on associated cost drivers and the impact of high cost users to the overall economics in a multi-ethnic Asian population.

Methodology: All patients with diabetic foot ulcer from 1 January 2021 to 31 December 2023 were queried through the hospital's electronic medical records system using International Classification of Diseases, 10th Revision (ICD-10) codes. Patient data obtained included demographic data, clinical data, treatment and outcomes. Financial records were obtained from hospital financial records. The cohort was further subdivided into low (0-25th percentile), intermediate (25-75%), high (75-90%) and extremely high (90-100%) cost groups. Comparative analyses between groups were performed using independent T tests. Multivariable analyses were used to identify associated cost drivers between groups, with statistical significance set at $P < 0.05$.

Results: A total of 1677 patients were identified – mean age was 65.7 years, 63% males, 49.8% with peripheral vascular disease (PVD), 27.3% with end stage renal failure (ESRF) and 10.2% with ischemic heart disease (IHD). The age adjusted Charlson's Comorbidity Index (CCI) was severe in 71.9% of our cohort. Major and minor amputations were performed in 11.6% and 20.1% of patients respectively, with 18.3% 30-day return to surgery and 2.3% in-hospital mortality. The mean length of stay was 13.2±16.6 days, and hospital cost per admission was around $30,000.

Comparison of the extremely high and the non-extremely high cost groups did not reveal any significant differences in age, gender, ethnicity and 30-day readmission rates. However, there was significantly higher rates of patients with high hospital frailty risk score, severe CCI, PVD, osteomyelitis, ESRF, IHD. Notably, the rates of major amputations (40.8% vs 8.4%), minor amputations (42.5% vs 17.6%), total number of surgeries (mean 2.4 vs 0.5) were significantly higher in the extremely high cost group ($p<0.001$).

The median cost incurred for the extremely high cost group (90-100th percentile; n=179) was 20 times higher than the low cost group. The extremely high cost group alone accounted for 40% of the total costs of all DFU patients. Within the extremely high cost group, length of stay ($p<0.001$), number of surgeries ($p<0.001$), ESRF ($p=0.016$), IHD ($p=0.001$), PVD ($p=0.007$) and major amputations ($p=0.039$) were statistically significant independent associations for cost.

Conclusion: Knowledge of the drivers and associations of high cost in inpatient diabetic foot care provides a basis for rethinking the surgical management of this high risk population and the institution of early multidisciplinary care to prevent complications.

Ind-1008 Cost of Active Case Finding for Tuberculosis in Africa: A Multicountry Analysis

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Introduction

Tuberculosis (TB) remains a significant public health challenge in Africa, compounded by co-morbidities like HIV and diabetes mellitus (DM). Active case finding (ACF) strategies seeks proactive screening of individuals especially in high-risk or underserved populations using different diagnostic tools to identify TB cases early, often before they seek care. It is crucial to improve TB detection rates, particularly in peri-urban areas which have a higher population density and poor living conditions. As part of the XACT III randomised controlled trial, we evaluated the provider-side costs of implementing an integrated ACF strategy using mobile GeneXpert diagnostic units across four African countries. The mobile units simultaneously screened for HIV (via rapid testing), DM (via glucometer), and CD4 count (via PIMA assay).

Methods

XACT III was implemented in Cape Town (South Africa), Maputo (Mozambique), Lusaka (Zambia and Harare (Zimbabwe) in peri-urban areas which have higher incidence of TB. The study collected data on economic costs using a mixed micro-costing (top-down & bottom-up) approach. The cost data was collected from provider's perspective for one calendar year (2021-2022) for capital and recurrent resources each country. The input resources were categorized into human resources, building/infrastructure, transport, equipment, consumables, trainings, and overheads. The list of outputs was prepared based on the activities in which staff was involved namely, community mobilization, screening, diagnostic testing, research and project management. The staff time for each activity was calculated using timesheets, observations and interviews. The capital resources were annualized and a discount rate of 3% was used. The research costs were excluded. All costs were collected in local currency units (LCU) and reported in United States dollars (USD).

Results

Mean annual cost of community mobilization was estimated at $ 811 per 100,000 population ($ 2,000 in South Africa to USD 209 in

Mozambique). The mean cost per person screened was $ 5.74 ($ 17.74 in South Africa to $ 0.53 in Zimbabwe). For GeneXpert test (Point-of-care) Zambia had highest unit cost of $ 41.09 and lowest of $ 27.30 in South Africa with a mean of $ 31.91. The mean cost of $ 3.72 for finger prick test by glucometer test with a range of $ 4.67 in South Africa and $ 2.45 in Mozambique. For HIV rapid testing and PIMA Assay for CD4 the mean cost was $ 4.75 and $ 26.77 respectively.

Across all sites, human resources (HR) constituted the largest share of total costs for activities such as community outreach and screening. Gene Xpert (PoC) and PIMA Assay require specialized equipment and consumables such as cartridges, thus constituting as major cost drivers across all sites. For rapid tests like glucometer and HIV lateral flow, costs were driven by HR and consumables.

Conclusion

Understanding the costs of ACF for TB in resource-constrained settings is essential to assess its budgetary implications and generate evidence on its cost-effectiveness. The identification of cost structures and resource needs will aid in planning for the scale-up of integrated ACF interventions in low- and middle-income countries, contributing to more effective TB screening strategies.

Ind-1101 Evaluating the Impact and Cost-effectiveness of a Reduced-Dose Schedule for Pneumococcal Conjugate Vaccine in Fiji: A Modelling Study

PRESENTER: **Fulgence Niyibitegeka**

AUTHORS: Stephanie Clark, Eleanor Neal, Natalie Carvalho, Petueli Veremalumu, Fiona M Russell, Stefan Flasche, Rachel Devi, Laila Sauduadua, Litiana Volavola

Background Pneumococcal conjugate vaccine (PCV) has reduced the burden of invasive pneumococcal disease (IPD) globally. Yet PCV remains one of the most expensive childhood vaccines. Cost has been a considerable barrier to PCV introduction into national immunisation programs of low- and middle-income countries and as extended valency vaccines are developed, this barrier may worsen. There are also concerns about the long-term financial sustainability of the three-dose PCV schedule with the introduction of more other costly vaccines. Several clinical trials on reduced dose schedules have explored the efficacy associated with two-dose schedules. In 2020**,** the UK switched from a three-dose to two-dose PCV schedule. Fiji introduced PCV in 2012 and is considering switching from a three to two dose schedule. This study was commissioned by Fiji Ministry of Health and Medical Services (MoHMS) following a request for evidence to inform this decision. We aimed to model the effect of switching from 3+0 to 1+1 PCV schedule on IPD and assess the cost-effectiveness and budget impact of this schedule change in Fiji. **Methods** We developed an age-stratified transmission model in R to simulate pneumococcal transmission under different PCV schedules. The model was fitted to carriage prevalence data from cross-sectional pneumococcal carriage surveys, with IPD outcomes estimated by case carrier rates. We modelled the effect of switching from a 3+0 to 1+1 PCV schedule over a ten-years (2024-2034). Epidemiological predictions along with costing parameters were input into an economic model developed in R. The cost of treating pneumococcal diseases (pneumonia and IPD) was estimated from primary data collection in Fijian health facilities. Incremental health systems costs (including provider training, policy change, communication and education) and vaccine dose and delivery costs were sourced from MoHMS and UNICEF data, supplemented with literature estimates. Health outcomes were measured in disability-adjusted life-years (DALYs). Net monetary benefit was calculated as the sum of economic value of health benefits and treatments cost savings less the cost of PCV program. A 3% discount rate was applied to future costs and outcomes. The budget impact was estimated over a five-year time horizon. A probabilistic sensitivity analysis will be conducted. **Results** Preliminary findings are presented. Our model predicts that if Fiji continues with a 3+0 schedule over the next 10 years, vaccine-type (VT) carriage prevalence would be eliminated (0.0% [95% CI 0.0-0.02%]) in children under five years by 2028. Switching to a 1+1 schedule in 2025 is predicted to achieve similarly suppressed VT carriage prevalence in young children by 2030. Despite additional programmatic costs associated with the schedule change, preliminary findings indicate an overall budget saving associated with a 1+1 schedule of US$1,561,472 over ten years. **Conclusion** Switching to a 1+1 PCV schedule in Fiji is predicted to nearly maintain the achieved high impact of the current 3+0 schedule in controlling VT while saving costs. While this evidence can be used to inform a potential schedule change in Fiji, there is a need for continued monitoring and disease surveillance to produce real world evidence that can support model-based predictions.

Ind-1365 Cost-Effectiveness of Combining Community-Based Care with Microfinance to Improve Viral Suppression Among Adults with HIV in Western Kenya

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Background: Findings from the Harambee cluster randomized trial in western Kenya suggest that interventions targeting financial and distance-related barriers to HIV care can help improve viral suppression among adults with HIV in rural, low-resource areas. However, to our knowledge, the cost-effectiveness of these multilevel interventions has not yet been shown.

Objective: We examined the economic costs and cost-effectiveness of combining community-based HIV care with group microfinance to improve viral suppression rates in Kenya.**

Study Design: The cluster randomized trial tested the delivery of care for HIV, hypertension and diabetes within community-based microfinance groups compared to the delivery of standard facility-based HIV care alongside group microfinance and to a matched comparison arm of facility-based HIV care patients alone (standard of care (SOC)). The analytic sample included n=407 members of 29 microfinance groups who received integrated community-based care, n=448 members of 28 microfinance groups receiving facility-based HIV care, and n=300 patients receiving facility care and not engaging in microfinance. All participants were >18 years of age, living with HIV, and an active patient of Kenya's Academic Model Providing Access to Healthcare program. The trial's primary effectiveness outcome was the odds of being virally suppressed (<200 cp/mL or < 400 cp/mL) at 18-months. Economic cost data came from multiple sources and were analyzed from the societal perspective. Generalized estimating equations estimated the incremental cost per patient for the 18-month trial between the intervention and SOC arms. Incremental effectiveness was reported as the number of additional patients achieving viral suppression due to the intervention.

Cost-effectiveness acceptability curves evaluated uncertainty in ICER estimates.

Principal Findings: Compared to patients who receive routine facility-based HIV and do not engage in microfinance activities, delivering HIV care within community-based microfinance groups cost an additional USD$98 per participant (95% CI: $94, $101) and virally suppressed an additional 23 (18, 27) patients over 18-months. This translated to a mean net change of 3.6 percentage points in the proportion of virally suppressed participants between the two arms at 18-months, and an incremental cost-effectiveness ratio of $2,694 ($2,151, $3,273).

Compared to patients who receive routine facility-based HIV and do not engage in microfinance activities, providing routine facility-based HIV care alongside community-based microfinance groups cost an additional USD$8 per participant (95% CI: $3, $12) and virally suppressed an additional 23 (19, 27) patients over 18-months. This translated to a mean net change of 3.4 percentage points in the proportion of virally suppressed participants between the two arms at 18-months, and an incremental cost-effectiveness ratio of $227 ($217, $463).

Implications for policy and practice: The largest cost drivers of community-based care were to the health system, but these costs were partly offset by the health-seeking costs saved by the patient.** If Kenya is willing to pay two times the country's per capita GDP (currently at $2,099) to increase HIV viral suppression, then the societal costs of delivering chronic disease care in the community does not appear to be prohibitive. Further research should evaluate if the multilevel intervention is cost-effective for improving retention in care.

Ind-1916 Assessing the Impact of Utility Models with and without Adjustment for Types of Complications on Outcomes of Economic Evaluations for Type 1 Diabetes

PRESENTER: **An Tran-Duy**, The University of Melbourne

Abstract

Background

Accurately tracking health utility changes over time is crucial for calculating quality-adjusted life years (QALYs), an important outcome measure in economic evaluations (EEs). In diabetes, most of the EEs use models that associate predicted occurrence of diabetes-related complications with health utilities. However, there is currently no consensus on the methods for combining utilities in EEs for diabetes. This study examined how various utility combination methods affect QALYs and incremental cost-effectiveness ratios (ICERs) in type 1 diabetes (T1D).

Methods

A validated T1D patient-level model was used to simulate disease progression and predict complications in a hypothetical cohort with a baseline age of 37 years and with HbA1c of 8.1%. Utility decrements, health state utilities, and complication costs were derived from the literature. Two utility models, additive and multiplicative, were applied to calculate utilities post-complication. In the additive model, utility post-complication equalled utility pre-complication minus the absolute utility decrement associated with that complication. In the multiplicative model, utility post-complication equalled utility pre-complication multiplied with the utility of the health state defined by the complication.

Within each utility model, two methods for combining utilities of complications belonging to one broad condition (coronary heart disease, metabolic disorder or neuropathy) and occurring within the same year were explored: taking the minimum utility or combining them using the same utility model. For acute complications, effects of permanent decline in utilities versus utility recovery one year after the events were also investigated. The EE compared an automatic insulin delivery system reducing HbA1c by 0.87% and annual risk of hypoglycaemia by 95% (the intervention) with an insulin infusion device reducing HbA1c by 0.24% (the control). Life years, QALYs and costs were discounted by 3.5% annually.

Results

An average patient aged 37 years was predicted to live 20.30 years in the control group and 21.04 years in the intervention group. QALYs ranged from 13.538 to 14.934 in the control group, and from 14.602 to 15.901 in the intervention group. In both treatment arms, lowest QALYs resulted from the multiplicative model with no utility adjustment for same-category complications and permanent utility reduction. Highest QALYs resulted from the additive model with minimum utility for same-category complications and utility recovery for acute complications. Differences in QALYs between the additive model and multiplicative model ranged from 0.592 to 1.150 for the control group and from 0.743 to 1.061 for the intervention group. Incremental QALYs associated with the intervention compared to the control ranged from 0.817 to 1.066.

The predicted mean healthcare cost per individual over the remaining lifetime was US$98,849 for the control group and US$186,273 for the intervention group. The incremental costs (US$) per QALY gained ranged from 82,032 to 107,023.

Conclusions

The choice of utility model can considerably affect the estimates of absolute QALYs, incremental QALYs and ICERs in EEs for diabetes. Development of guidelines for combining utilities in diabetes is crucial given that individuals with diabetes experience many complications. EEs for diabetes must transparently describe their specific approaches to integrating health utilities.

abs-os494 Analysis of Policy Options to Reduce the Prevalence of Anaemia in Children Aged 6 to 23 Months in Southern Province of Zambia

PRESENTER: **Clive Banda**

AUTHORS: Chipwaila Chungu, Twambo Nambao, Nonde Sinyangwe, Kutha Banda, Chipo Siafwa, Mambo Nsanzya, Sandra Sakala, Ibrahim Abdallah, Lawrence Mwenge

Background

About 7 out of 10 children aged 6-23 months have anaemia in Southern Province. According to the World Health Organisation (WHO), this is a severe public health concern, and iron supplementation for all children is recommended if the prevalence exceeds 40%. Iron deficiency anaemia can lead to undesirable health and economic outcomes. In Zambia, testing for anaemia and iron supplementation is not routine despite evidence indicating that micronutrient powder (MNP) supplementation produces good results in reducing iron deficiency anaemia-related poor outcomes at a minimal cost.

Methods

Two policy options; supplementing children 6-23 months with Micronutrient Powder (MNP) and mandatory test and treat all children aged 6-23 months for iron deficiency were compared with the status quo. We then conducted a cost-effectiveness analysis using a decision tree. The analysis used the Ministry of Health (MoH) perspective and the intervention timeframe of 3 years. The outcome of the analysis was anaemia cases averted.

Results

Implementing the MNP supplementation policy would avert about 56,908 anaemia cases per year with an Incremental Cost Effectiveness Ratio (ICER) of $9.90. An additional $9.90 is needed to avert one additional case of anaemia. The mandatory test and treat program had an ICER of $240.05, with a need of $240.05 to avert an additional case of anaemia.

Conclusion and next steps

Introducing micronutrient powders to all children aged 6-23 months is an effective option to avert anaemia cases by 50% in the first year of implementation in Southern Province. This strategy was seen to work in Mbala, in Northern Province of Zambia and other countries like Uganda, Kenya, and South Africa. Hence, it can produce similar results in Southern Province if integrated into existing community health programs.

abs-os697 Cost-Effectiveness of PrEP Implementation in Indonesia to Reduce New Cases or DALYs of HIV Infection

PRESENTER: **Mery Nurma Juwita**

AUTHORS: Adiatma Y.M Siregar, Ferry Hadiyanto

Background: The WHO recommends the Pre-Exposure Prophylaxis (PrEP) as an additional prevention of HIV/AIDS. Several countries have implemented PrEP as one of their HIV/AIDS prevention interventions, and Indonesia has started a PrEP pilot project in primary health care and HIV community clinics in several cities in 2022, with PrEP accessed by 2,284 men who have sex with men (MSM) and 340 Female Sex Workers (FSWs), representing 19.14% of MSM and 11.73% of FSW from the target PrEP recipients business-as-usual (BAU scheme). The country has targeted to cover 30% of the HIV-negative population in 2030.

Methods: This study presents a cost effectiveness analysis of PrEP implementation among MSM and FSWs in Indonesia by comparing the BAU PrEP coverage with various scale-up schemes, using the new cases and DALYs averted as the benefits in the Incremental Cost-Effectiveness Ratio (ICER) calculation. The analysis used 25%, 50%, 75%, and 100% scale-up schemes, assuming 25%, 50%, 75%, and 100% coverage of the 2030 target, i.e., 30% of the HIV-negative target populations, respectively. The number of new cases averted was estimated using Spectrum tools, while DALYs averted was estimated using GBD data.

Results: Increased implementation coverage results in increase in costs and aversion of new cases and DALYs, in addition to a better cost-benefit ratio as a result of the averted use of ARVs. The scale-up programs require a total cost ranging from USD32,072,482 to USD128,256,347, while the BAU scheme's total cost for PrEP is USD22,889,674. The cost per new case averted ranges from USD18,478 to USD20,050, and the cost per DALYs averted ranges from USD4,406 to USD4,781. The cost-benefit ratio of PrEP scale up, based on the averted use of ARVs, increases from 1.55 to 1.58.

Conclusion: Using the ICER, all scale-up schemes examined are more cost-effective than the BAU. The 75% scale-up scheme is more cost-effective, indicating that PrEP is more cost effective when provided to specific key population at risk as opposed to the entire eligible population.

8:30 AM –10:00 AM TUESDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Karangasem

Child, Maternal and Elderly Health

MODERATOR: **Laurence Hartmann**,

Ind-488 Construct Validity Test of the Quality of Care Experience- Aged Care Consumers (QCE-ACC) in Residential Aged Care

PRESENTER: **Digisie Jemere**, Flinders University

AUTHORS: Jyoti Khadka, Rachel Milte, Julie Ratcliffe

Abstract

Objective: Providing quality of care for older people remains a consistent global challenge, and the Australian Aged Care system has not been exempted from persistent issues of sub-standard care. The Quality Care Experience – Aged Care Consumer (QCE-ACC) is new instrument designed to measure quality of care from the perspective of older people receiving care themselves. It has two scoring methods – a simple summative score for use in quality monitoring, and a preference-based scoring system amenable for use in economic evaluation. The QCE-ACC has also been adopted as a mandatory quality indicator nationally in Australia in 2023. This study aimed to undertake a detailed evaluation of the construct validity of QCE-ACC among older people living in the residential aged care facilities.

Methods: Older adults over the age of 65 receiving residential aged care services participated in face to face interviewer where they were asked complete a range of questionnaires including the QCE-ACC, QOL-ACC (Quality of Life-Aged Care Consumers), EQ-5D-5L, ASCOT (Adult Social care Outcome Toolkit) and two items measuring self-reported global health and, global quality of life. Feasibility was assessed through examining the missing data and floor/ ceiling effects. Construct validity was explored through two approaches: convergent validity, by testing the correlations between the QCE-ACC and other related instruments against a priori expectations, and known group validity, by evaluating the QCE-ACC's ability to differentiate individuals with levels of self-rated health and quality of life. Internal consistency reliability was measured using Cronbach's alpha (α).

Results: Of the 200 residents (mean age, 85 ±7.7 years), more than half, 113(56.5%) were over the age of 85, 60% were female and majority, 137(68.5%) were Australian born. The QCE-ACC showed adequate feasibility with no missing data and acceptable floor (0.5%) and ceiling effect (24%). The QCE showed moderately statistically significant correlation (ρ = 0.637 &0.619) with the Quality of Life- Aged Care Consumers (QOL-ACC) and Adult Social Care Related Quality of life (ASCOT) measures. The QCE-ACC is capable of differentiating between varying levels of self reported health and quality of life. The QCE-ACC and its dimensions showed good internal reliability consistency (α = 0.77–0.81).

Conclusion: The QCE-ACC demonstrated adequate feasibility, validity and internal consistency to assess the quality of care in residential aged care. This study provides some evidence that supports the use of QCE-ACC in economic evaluation of residential care and supports. It also validated the practicality of its use among older people in long term care settings. Validation of the QCE-ACC on a sample of older people with dementia and cognitive impairment would be useful. The need for developing and testing accessible as well as proxy versions would be a future direction for this work given the significant prevalence of dementia and cognitive impairment in long term care settings.

Keywords: residential care, validity, reliability, older people, quality of care

Ind-1973 The Inter-dependency Between Social and Hospital care: The Effect of Municipality Social Spending on Elderly Hospital-related Outcomes.

PRESENTER: **Irene Torrini**
AUTHORS: Giovanni Fattore, Simone Ghislandi

In recent years, assessments of social systems and interdependencies with the hospital setting have become increasingly relevant. Reduced social services may lead to prolonged hospital stay if patients cannot be discharged due to lack of support in daily living, resulting in increased hospital spending and inefficient allocation of resources. The latter could be freed up while increasing acute sector capacity, accelerating hospital bed turnover, and reducing waiting lists. However, the interdependencies between social and acute services remain unquantified and social care largely underfunded. In this paper, we estimate the effect of municipality social spending (MSS) on elderly hospital-related outcomes by exploiting an administrative panel (2012-2019) of hospital discharge records for the entire Italian over-65 population. To the best of our knowledge, this is the first work addressing the relationship between SS and hospital care in Italy. Available evidence is scarce and provides unclear results. Moreover, many studies use aggregated data and do not account for much of the variability in hospital outcomes, largely determined by patient's and hospital's characteristics. We contribute to the existing literature by estimating standardized measures of municipality length of stay (LOS) and admission costs to examine outcome variability net of the effects of municipality-unrelated factors. We specify a multilevel model in which hospital admissions are nested within municipalityXyear groups and model LOS and costs as a function of patient's demographic and clinical factors, hospital characteristics, and municipalityXyear correlated random effects (CRE), with the latter representing our time-varying standardized (S-) measures. Per-capita hospitalizations and readmissions are also used as outcomes to study not only the substitutability with hospital care, but also the potential of social assistance in preventing the onset of acute cases and managing the post-discharge phase in out-of-hospital settings. The effect of MSS is estimated by specifying a random effects model at the municipality level. We also investigate heterogeneities by municipality population structure, hospital and territorial care supply, and geographic area. Results show that MSS reduces S-LOS, S-costs, and number of admissions and readmissions, indicating substitution between social and inpatient care. The effect is larger for municipalities with a significant percentage of over-65 and high-income individuals, suggesting income-based inequalities and greater effectiveness of social care in improving hospital outcomes for the elderly. Also, while strong effects are found for urban municipalities in the North of the country, the coefficients lose their statistical significance for rural municipalities in the South and Islands. Finally, MSS is found to be more effective in municipalities with a low supply of hospital care and a high supply of out-of-hospital care, with social assistance displacing inpatient care and complementing territorial care. From a policy perspective, this paper emphasizes the importance of investing in social care to improve hospital supply capacity and increase accessibility to inpatient care while reducing costs. In resource allocation decisions, priority should be given to rural and poor municipalities and those located in the south of the country and islands.

Ind-782 Who Benefits Most From Home-visit Nursing Services? Evidence From Long-term Care Beneficiaries in South Korea

PRESENTER: **Sunghun Yun**
AUTHOR: Hongsoo Kim

Background:

As populations age, home-based long-term care (LTC) services, such as home-visit nursing, are increasingly viewed as critical interventions for managing older adults' complex needs to enable ageing in place. While some studies have shown that home-visit nursing interventions can reduce hospitalizations among frail older adults, research exploring whether their effectiveness differs between those with complex needs requiring both nursing care and home visits and those without such needs remains limited. This study addresses this gap by using LTC beneficiaries in South Korea where nationwide public LTC insurance is available, to explore whether visiting nurse interventions for community-dwelling long-term care beneficiaries can delay institutionalization or death and also evaluated their impact on healthcare costs, with a focus on effect heterogeneity due to baseline physical functionality and nursing care needs.

Objective:

To explore the differential impact of home-visit nursing services among LTC beneficiaries in South Korea and identify subpopulations that derive the most benefit, based on nursing and functional needs.

Methods:

We analyzed data from the National Health Insurance Service (NHIS) for whole South Korean individuals newly eligible for LTC services between 2016 and 2018 (n=140,968). Beneficiaries were categorized into four subgroups based on nursing care needs (e.g., wound care, catheter management) and limitations in physical functioning (Activities of Daily Living scores): (1) low nursing/low functional, (2) low nursing/high functional, (3) high nursing/low functional, and (4) high nursing/high functional needs. Baseline characteristics, including comprehensive geriatric assessment variables and pre-treatment healthcare utilization trends, were adjusted using propensity score matching. Health outcomes (e.g., institutionalization, unplanned hospitalizations) and healthcare costs were analyzed using survival models for time-to-event outcomes and regression models for cost outcomes.

Results:

Home-visit nursing significantly reduced healthcare costs among beneficiaries with high nursing and high functional needs (Group 4), with reductions of 39.5% in total healthcare costs, 36.1% in outpatient costs, 74.6% in inpatient costs, and 59.1% in tertiary hospital costs. Beneficiaries with low nursing and high functional limitations (Group 2) also experienced a 53.5% reduction in outpatient costs, although overall cost reductions were smaller and statistically insignificant. In contrast, no significant effects were observed on health outcomes such as institutionalization or unplanned hospitalizations across any subgroup.

Conclusions:

The findings underscore the global relevance of adopting a need-based approach to allocating scarce home-visit nursing resources, particularly as ageing populations and the demand for long-term care services continue to rise worldwide. While these services effectively reduce healthcare costs without compromising health outcomes for high-need populations, their limited impact among low-need populations highlights the necessity of tailoring interventions to individual needs. In Korea, the lack of effective service coordination based on needs suggests a critical area for policy improvement, offering lessons for other countries seeking to optimize the efficiency and equity of their LTC systems. Future research should also examine the broader impact of home-visit nursing on quality of life and caregiver burden, providing insights to inform more holistic and globally applicable LTC policies.

abs-os613 Improving Access to General Medical Care for French Ehpad Residents: Evaluation of a Natural Experiment on the Quality of Drug Prescriptions

PRESENTER: **Laurence Anne Hartmann**, National Conservatory of arts and crafts
AUTHORS: Mathieu Narcy, Elsa Boulet

Since 2017, the Paris Regional Health Agency has implemented an innovative program to address medical care shortages in nursing homes. The initiative provides funding for dedicated prescription time by physicians to care for residents without regular GPs. The program allocates subsidies based on a full-time equivalent (FTE) system, ranging from 0.10 to 0.90 FTE depending on resident numbers. Either general practitioners, specialists, or coordinating physicians can provide this service. Following a series of application calls between 2017-2019, 163 nursing homes (25% of the region's total) joined the program. The funding model uses a capitation system where 0.1 FTE (equivalent to a half-day per week) covers 10-15 patients. The initiative aims to ensure consistent medical monitoring while reducing polypharmacy risks and unnecessary hospitalizations.

The purpose of the research was to determine the extent to which the care consumption of nursing homes residents can be affected by the introduction of a dedicated prescribing time for residents who do not have GP. To assess the causal effect of this time allocation, the methodology used is the "double differences" method. This method can be used because of the quasi-experimental nature of the deployment of the prescription support system, since the financing of this dedicated time did not concern all the nursing homes in the Paris region, but only some of them. The principle of this method is to compare the care consumption of residents in nursing homes benefiting from this dedicated time with that of residents in nursing homes not benefiting from it. In the specific context of our study, this method considers the fact that the introduction of this dedicated time did not take place, for all experimental nursing homes, in the same year, but over three successive years (2018, 2019 or 2020).

The implementation of dedicated medical time significantly impacted prescription patterns and healthcare services delivery. Notable improvements emerged in the detection and treatment of previously underdiagnosed conditions, particularly depressive syndromes. The study observed a reduction in polypharmacy alongside increased screening procedures for biological, radiological, and dental issues.
The analysis revealed distinct approaches between coordinating and non-coordinating physicians:
- Non-coordinating physicians showed preference for single-treatment approaches, including anxiolytics and fluoroquinolone-based antibiotics, with increased reliance on biological testing and hospital referrals.
- Coordinating physicians demonstrated greater focus on long-term treatment management, particularly in adjusting hypnotics and antidepressants prescriptions, while favoring safer antibiotic profiles and preventive care measures.
The findings highlight not only the importance of physician specialization in geriatric care but also the effects of a regular presence in nursing homes for optimal resident care management. Coordinating physicians, with their geriatric expertise and institutional involvement, showed greater tendency toward preventive care and quality-of-life considerations, while non-coordinating physicians adopted more cautious, standard clinical approaches.
These results suggest the value of promoting specialized geriatric training and supporting coordinating physicians in expanding their prescriptive roles within nursing homes. This could inform ongoing legislative discussions regarding the expansion of the French nursing homes coordinating physicians' prescriptive authority.

Ind-1687 Promises Unmet: Changes in Availability and Quality of Antenatal Care in Burkina Faso's Free Maternal Health Program

PRESENTER: **Offosse Marie-Jeanne Ngbesso**
AUTHORS: Aduragbemi Banke-Thomas, Kadari Cisse

Background: Almost 94% of all maternal deaths occur in low and lower-middle income countries including Burkina Faso. To reduce maternal mortality, the government of Burkina Faso have implemented many health financing strategies including free maternal healthcare services in June 2016 under the fee exemption policy, known as the Gratuité scheme. However, recent studies fail to demonstrate a substantial impact of these strategies on service availability. The study objective is to analyze the trend of Comprehensive antenatal care (ANC) provision in health facilities health facilities between 2012 and 2020 with a specific focus on the Gratuité policy implementation period (2016-2020). **Methods:** We conducted a longitudinal trend analysis using repeated cross-sectional surveys. The Service Availability and Readiness Assessment (SARA) conducted in 2012, 2014, 2016 and 2018 and Health Harmonized Facilities Assessment (HHFA) survey conducted in 2020, were used for this analysis. Readiness index was calculated in two ways: simple approach and domain weighted approach. The readiness indicators were defined based on the World Health Organization (WHO) SARA and HHFA guidelines. Gratuité period was coded as a binary variable, with 1 representing the Gratuité period and 0 for the period before Gratuité. Trends were assessed using multivariate linear regression. **Results:** The availability of comprehensive antenatal care (ANC) services in health facilities decreased by 8 points between 2012 and 2020, with a slight recovery in 2020. The decline is more pronounced between 2016 and 2018, coinciding with the introduction of the Gratuité scheme, affecting primary healthcare facilities more than secondary and tertiary facilities. While there was a high decline in urban health facilities (13 points) in the immediate post-Gratuité, Rural facilities saw a decline of only 4 points. The decline is widespread across regions, with some exceptions in Regions with security challenges and humanitarian aid. The study shows a 1.3-point decrease in overall readiness scores for health facilities providing ANC services, with a higher decline following the introduction of Gratuité. Staff and guidelines have a decreased trend, while equipment, diagnosis, medicine, and products have an increased trend. However, the increased trend hides important quality issues such as Hemoglobin and Syphilis testing capacity and IPTP drugs available in less than half of health facilities. **Conclusion:** This study showed decreased ANC services availability and readiness between 2012 and 2020 in Burkina Faso. Universal health care entails both access and quality of care; as such, in addition to removing the financial barrier for all women in Burkina Faso to access ANC services, the government must ensure comprehensive ANC services in all health facilities. There is an urgent need to pay attention to ANC service strengthening, particularly the availability of trained health professionals, guidelines and commodities at all healthcare system levels. Otherwise, women in Burkina Faso might access sub-optimal care due to low service readiness and pay external providers to obtain comprehensive care, exposing households to catastrophic health expenses.

Ind-1599 Can Culturally Tailored Health Strategies Achieve Universal Facility-Based Deliveries and Exclusive Breastfeeding?

PRESENTER: **Nancy Marhadi**
AUTHORS: Zhafirah Yanzli Anisah, Widiantoro Saputro

Indonesia's current maternal mortality rate (MMR) and infant mortality rate (IMR) stand relatively high, at 173 per 100,000 live births and 19.3 per thousand live births, respectively. These indicators are not aligned with the target for the sustainable development goals by 2030. In this respect, it is crucial to improve maternal and newborn health care to improve the MMR and IMR, which are priorities in health concerns in Indonesia and the world. The geographical accessibility to health facilities and the local belief in witch doctor practice remained the significant obstacles in achieving universal facility delivery as well as exclusive breastfeeding in rural Indonesia. To address these issues, the Gunung Timang subdistrict public health centre developed a community-focused, integrated maternal management model designed to empower communities, improve health knowledge, and promote behavioural changes to enhance maternal and newborn health outcomes.

This study adopted a mixed-method approach, using quantitative and qualitative analysis to determine the integrated maternal management model's effectiveness. We analysed maternal and child health service data from 2019 to 2023. We conducted semi-structured interviews with local authorities, public health centre medical staff, local witch doctors, pregnant mothers, teenage mothers, women in delivery, and nursing mothers.

The proposed maternal management model combines eight infant, toddler, and mother health posts (Posyandu), eight youth health classes, six classes for pregnant women, and three nursing mother supportive groups into six major programs. There existed, for example, a partnership

between local witch doctors and public health centre medical staff, as well as a free-of-charge waiting home for maternity to ease resistance in rural communities. Following the integrated model of maternal management, Gunung Timang subdistrict had zero MMR and IMR for five continuous years, starting from 2019 to 2023. Facility-based births increased from 86% to 100%, and the rate of exclusive breastfeeding also rose from 54% to 100%.

Maternal and neonatal mortality can only be prevented if the strategy of providing care for mothers and infants involves management models suitable to the needs and resources available in rural communities. Indonesia should include them in its plan to fulfil the SDG of ensuring the survival of mothers and children.

Keywords: maternal mortality; infant mortality; quality health care; public health; rural population

Ind-2123 Non-Financial Strategies for Modifying Health Worker Effort and Care Delivery in Primary Care Settings: A Systematic Review and Meta-Analysis

PRESENTER: **Vasanthi Subramonia Pillai**, Technical University of Munich
AUTHORS: Caterina Favaretti, Mr. Nikkil Sudharsanan, Julia Gröll

Background: Clinicians often deviate from medical guidelines and significantly under-deliver care in primary care settings. Health worker motivation and effort are critical factors in improving clinical adherence to guidelines and the quality of care delivery. Although financial incentives are an obvious approach to improving care delivery, implementing financial incentives for health workers' behavior change can be challenging because of limited resources and weak regulatory systems in several settings. Moreover, existing evidence shows that the impact of financial incentives is often short-lived. Without long-run effects, temporary financial aid may not provide sufficient impetus to bring about sustained changes in clinician behavior. On the other hand, a growing body of work examining the effect of non-financial incentives has shown promising results in resource-constrained settings. Studies find that strategies such as performance feedback, education and training, and provision of clinical decision support systems are instrumental for clinician behavior change. Some studies also find non-monetary interventions effective in improving care quality among non-medical health workers, who play an important role in healthcare delivery However, currently, there is limited comprehensive evidence on the extent to which each of the strategies works, whether specific strategies outperform others, and under what contexts and circumstances they work the best. Therefore, we conduct a systematic review and meta-analysis to synthesize existing evidence on the causal effects of non-financial strategies on health worker effort and care quality, identifying the most effective approaches to improve primary care delivery.

Methods: The review will include randomized controlled trials and rigorously conducted quasi-random experiments published after 1999, assessing non-financial strategies to improve health worker performance and effort. The primary outcomes are changes in health worker performance (e.g., adherence to care guidelines) and care delivery metrics (e.g., the number of patients screened). Secondary outcomes include health-related metrics such as patient blood pressure levels. Searches will be conducted in EconLit and Web of Science, limited to English-language articles. Data extraction and risk of bias assessment will follow standardized protocols using tools like GRADE and Rayyan.ai. Meta-analyses will estimate pooled effects using standardized mean differences (Cohen's D), and subgroup analyses will explore heterogeneity by intervention type, health worker demographics, and care contexts.

Results: We screened a total of 8502 articles at the abstract stage and included 139 for the full-text screening. Post full-text screening, we identified 73 articles that met the eligibility criteria for the study. Preliminary results will include descriptive summaries of study settings, intervention characteristics, and effect sizes, emphasizing identifying strategies that significantly impact health worker behavior and patient outcomes. We are finalizing the data extraction and plan to begin the meta-analysis shortly. A first draft of the results is expected by February 2025.

Discussion: This review will provide comprehensive evidence on the role of non-financial incentives in modifying health worker effort and care delivery. Findings will have critical implications for policy and practice, guiding the design of cost-effective strategies to enhance primary care services globally. The review will also identify gaps in the existing literature, offering directions for future research.

Ind-1500 Gender Mix and Team Performance: Evidence from Obstetrics

PRESENTER: **Manasvini Singh**
AUTHOR: Ambar La Forgia

Background and Contribution

It is important to understand how the gender mix of teams affects performance in high-stakes professional environments. While existing research on gender dynamics in teams largely focuses on artificial settings like classrooms or online experiments, these findings may not generalize to complex, real-world contexts where teams have to synthesize a range of experiences and expertise to make decisions in collaborative settings. This study addresses this gap by examining the influence of gender mix on expert team performance in a high-pressure environment with life-or-death consequences: childbirth.

Research Question

How does the gender mix of physician teams impact maternal and fetal health outcomes during childbirth, and what are the underlying mechanisms drive differences in outcomes?

Methods

This study uses data spanning the universe of births in Florida over ten years, encompassing over 2 million births. For the main analysis, we focus on a subset of about 580,000 births where patients were quasi-randomly assigned to two-physician teams of varying gender mix (the "team sample"). Controlling for rich patient and physician characteristics, we compare team performance – measured using maternal complication rates and fetal death rates -- across the four team types (Male-Male, Female-Male, Male-Female, and Female-Female). To explore mechanisms, we use births attended by a single physician (the "solo sample") to understand how individual preferences for potentially harmful obstetric practices (e.g., discretionary or discriminatory practices) play out in collaborative team settings.

Key Results

Being in a same-gender team improves performance for female, but not male, physicians. As a result, team performance, ranked from best to worst is: female-only teams, mixed-gender teams, then male-only teams. If female-only teams had performed all deliveries in the dataset, 9.5% of maternal complications and 12.3% of fetal deaths could have been prevented. The findings are not attributable to differences in patient demographics or physician expertise across different team types. Instead, performance differences are driven by two key factors:

1) Gendered preferences for harmful practices: Male-only teams use harmful obstetric practices far more than female-only teams. This occurs because there are gendered differences in individual physician preferences for these practices (i.e., male physicians are more likely to use these practices than female physicians even when practicing individually). 1) Conflict resolution: Mixed-gender teams are more likely to have conflicts in member preferences than same-gender teams, and conflict is particularly harmful for the performance of mixed gender teams led by female physicians. We hypothesize that this may be due to the reversal of traditional gender norms in leadership roles in such teams, which could explain their heightened vulnerability to several frictions to teamwork (such as lack of prior collaboration etc).

Conclusions and Implications

Team gender composition has significant implications for performance in critical healthcare tasks. Policies promoting diverse and collaborative team environments should prioritize addressing gendered preferences for medical practices and improving mechanisms for conflict resolution. These findings have broad relevance for optimizing team performance in other high-stakes contexts.

8:30 AM –10:00 AM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Lotus

Rare and Non-Communicable Conditions

MODERATOR: **David Watkins**,

Ind-417 Generalized Cost-Effectiveness Analysis with Dynamic Prevalence for Improving Health Equity Among Rare Diseases

PRESENTER: **William Padula**, University of Southern California
AUTHOR: Vasco Pontinha

ABSTRACT

Background: According to Lakdawalla & Phelps (2021), there is a documented link related to known relative risk (*r*) preferences in health and willingness-to-pay (*K*) scaled by gross domestic product-per-capita (*M*) using generalized risk-adjusted cost-effectiveness (GRACE) theory for the valuation of health technology. As a result, GRACE addresses limitations of cost-effectiveness analysis pertaining to biases against patients with disabilities, among other health equity concerns. Notwithstanding, the rarity of a disease further exacerbates inequitable patient access to healthcare, as decisionmakers are often persuaded to allocate healthcare resources to larger subgroups, all else being equal under fixed willingness-to-pay, that is, $K = M / [1 – r2]$.

Objective: This paper examines the relationship between relative risk in GRACE theory to relative risk in epidemiologic foundations in order to establish a correlation between WTP and the prevalence of disease*.*

Methods: Using GRACE theory, we mathematically derived the relationship between WTP and relative risk as a function of dynamic prevalence of disease over time, that is, $K(t) = M / [1 – (prevalence t2)2]$. Then by applying foundations of Expected Utility Theory, we establish that willingness-to-pay increases exponentially as diseases become rarer based on the standardized prevalence factor using a Box-Cox transformation of prevalence. We then acquired data from the U.S. Medical Expenditures Panel Survey (MEPS), and linked to disease prevalence data from the U.S. Centers for Disease Control and Prevention (CDC) in order to develop a linear transformation of standardized prevalence factors. We used two data points in our analysis to calibrate willingness-to-pay as a function of disease prevalence: ($0, 100% prevalence); and ($104,000, 33% prevalence), according to Vanness and colleagues (2020) estimation of U.S. willingness-to-pay based on opportunity costs of average care for the Medicare population related to statin use for hypercholesterolemia. Finally, we examined the direct relationship between disease prevalence and willingness-to-pay for two important rare diseases: Sickle Cell Disease and Duchenne Muscular Dystrophy.

Results: WTP thresholds in the U.S. could vary between $104,000/QALY for the most prevalent *observed* conditions and $990,049/QALY for

the rarest observed medical conditions. In particular, we found that for Sickle Cell Disease, with a prevalence of 0.03% and a standardized prevalence factor of 0.825, K = $326,233/QALY. For Duchenne Muscular Dystrophy, with a prevalence of 0.015% and a standardized prevalence factor of 0.912, K = $621,247/QALY.

Conclusion: As a result, this novel approach referred to as "Generalized Dynamic Prevalence" offers a solution to empirical incorporation of the rarity of disease with dynamic prevalence over time in cost-effectiveness analysis in addition to other novel value elements established in GRACE theory, namely health equity, disease severity, insurance value, and value of hope. This approach to generalized cost-effectiveness analysis suggests a method by which dynamic prevalence may help inform priorities for resource allocation across rare disease cohorts.

Ind-1105 Cost-Effectiveness of Myopia Prevention Interventions Among Children and Adolescents in China

PRESENTER: **Bonan Fan**
AUTHOR: Yan Li

ABSTRACT

Introduction: Myopia poses a significant public health challenge in China. While several interventions have been shown to be effective in preventing and controlling myopia among children and adolescents in China, their cost-effectiveness remains unknown.

Methods: We developed a decision-analytic microsimulation model to simulate the progression of myopia in children and adolescents in China. The model assessed the cost-effectiveness of multiple interventions—including 0.01% atropine eye drops, increasing outdoor activities, orthokeratology (ortho-k) and their combinations—in preventing and controlling myopia. We estimated model parameters using data published by the National Health Commission of China and from the literature. The model calculated the quality-adjusted life years (QALYs), healthcare costs, and incremental cost-effectiveness ratios (ICERs) for the interventions versus the status quo. Deterministic and probabilistic sensitivity analyses were conducted to assess the robustness of our findings.

Results: Increasing outdoor activities was cost-saving in preventing myopia in children and adolescents in China. Among the interventions, ortho-k yielded the highest incremental QALYs, at 0.583 years. Single 0.01% atropine eye drops showed the highest ICER at $67,524/QALY. Whether used alone or in combination with increasing outdoor activities, atropine eye drops lack cost-effectiveness. Increasing outdoor activities, whether implemented alone or in combination with ortho-k, has potential to prevent myopia and related diseases in the largest number of children and adolescents, with an estimated impact on over 16.2 million individuals in China. The combined intervention of ortho-k, increasing outdoor activities and atropine eye drops could prevent the greatest number of severe myopia-related conditions, including myopic maculopathy and blindness, affecting over 1 million individuals.

Discussions: This study demonstrates that increasing outdoor activities, ortho-k and the combination of any intervention with ortho-k are effective and cost-effective strategies for preventing and controlling myopia in children and adolescents in China. In particular, increasing outdoor activities is cost-saving. However, 0.01% atropine eye drops, whether used alone or in combination with increasing outdoor activities, are not cost-effective. These findings provide evidence for the integration of these interventions into national school health programs, potentially leading to significant public health and economic benefits.

8:30 AM –10:00 AM TUESDAY [Evaluation Of Policy, Programs And Health System Performance]

os149 Bali International Convention Centre – Orchid

Innovative Health Financing for Marginalized Populations: Impact Evaluation of Synergistic Subsidized Health Insurance and Conditional Cash Transfers

MODERATOR: **Judite Gonçalves**, Imperial College London

CONVENER: **Budi Hidayat**, Center for Health Economics and Policy Studies, Universitas Indonesia

DISCUSSANT: **Thomas Hone**, Public Health Policy Evaluation Unit, Imperial College London

abs-os227 Econometric Analysis of Synergistic Demand-Side Health Financing Programs: Harnessing the Power of Integration

PRESENTER: **Taufik Hidayat**, Universitas Indonesia
AUTHORS: Judite Gonçalves, Thomas Hone, Nur Cahyadi, Christopher Millett, Budi Hidayat

Background: Subsidized health insurance (PBI) and conditional cash transfers (PKH) are key components of demand-side health financing (DSF) programs in Indonesia. Evaluating their combined impacts is challenging due to variations in interventions, which may violate the Stable Unit Treatment Value Assumption (SUTVA). We address this by using a multivalued treatment approach, which accounts for treatment variations and enables robust analysis.

Research Gap and Contribution: This study addresses a gap in the literature by evaluating methods for assessing the impact of individual and combined DSF programs on maternal health and financial protection. Using advanced econometric models, we analyze the synergistic effects of subsidized health insurance and PKH, and propose strategies to enhance the reliability and validity of impact estimates.

Research Questions: (1) What are the most effective econometric methods for quantifying the impacts of individual and combined DSF programs?

Methods: Using data from a three-wave PKH panel survey (baseline, midline, and end-line), we compare four groups: households receiving subsidized health insurance (PBI), PKH, both PBI and PKH, and a control group. Covariates are balanced using generalized propensity scores (GPS) with a multivalued treatment approach, and balance is assessed via standardized mean differences (SMDs), variance ratios (VR), and percentage bias. Treatment effects are estimated using inverse probability treatment weighting (IPTW) and matching (GPSM), with models including generalized estimating equations (GEE), generalized linear models (GLM), and Difference-in-Differences (DiD). Nine models are compared, and the best model is selected based on predefined model selection criteria.

Findings: Diagnostic tests confirmed that GPS IPTW and GPSM effectively balanced the groups. The combined PBI-PKH group showed the most significant improvements in maternal health-seeking behaviors and financial protection. Average treatment effect on the treated (ATT) estimates were consistently higher than average treatment effects (ATE), and DiD models generally provided the lowest impact estimates.

Conclusion: The choice of evaluation method should consider the research context, especially the need to balance covariates and address unobserved factors. Combining DSF programs improves maternal health outcomes and financial protection.

abs-os229 Economic Evaluation of Multiple Demand-side Health Financing Subsidies in Indonesia

PRESENTER: **Susan Griffin**, Centre for Health Economics, University of York
AUTHORS: Simon Walker, Budi Hidayat, Pujiyanto Pujiyanto, Peter Murphy

Background and Motivation: Impact evaluations of policies such as subsidized health insurance (PBI) and conditional cash transfers (PKH) provide information on whether they improve health access and outcomes. However, they are infrequently extended to provide the kind of cost-effectiveness information required to determine whether these schemes should be prioritised over other uses of public money. This study demonstrates how impact evaluation can be extended to assess the value for money of these programs through cost-effectiveness analysis (CEA), multi-sectoral analysis, and equity analysis.

Research Gap: While previous studies have explored the impact of the PBI and PKH programs, both individually and combined, on healthcare utilization, there has been limited evaluation of their cost-effectiveness, especially in terms of equity and broader social outcomes. This study fills this gap by showing how the results of impact evaluation can be used to inform a comprehensive economic evaluation, assessing both health outcomes and their effects on inequality.

Research Questions: The key questions are: 1) Who are the relevant decision makers to inform with economic evaluation of PBI and PKH? 2) What are the equity concerns and associated priority population groups relevant to inform the value assessment? 3) How does a traditional cost-effectiveness analysis of PBI and PKH differ to one that incorporates impact on health inequalities and outcomes beyond health?

Methods: This study uses an extended impact inventory approach to economic evaluation, considering multiple Government sectors, health and education outcomes, and impacts on consumption and productivity. We show how the health outcomes considered in impact evaluations such as prenatal visits and child immunizations can be extended to understand their impact on key outcomes such as Disability-Adjusted Life Years (DALYs) averted, school enrollment, and healthcare utilization. Finally, we review the way in which the policy cost can be estimated and incorporated to determine value for money.

Conclusions and Policy Implications: This study offers valuable evidence on how impact evaluations can be extended to consider the cost-effectiveness and equity of PBI and PKH. Findings will guide policymakers in resource allocation, ensuring equitable healthcare access for vulnerable populations, and supporting Indonesia's progress toward Universal Health Coverage (UHC).

abs-os222 The Synergistic Effects of Multiple Demand-Side Health Financing Programs on Maternal Health and Financial Protection in Indonesia

PRESENTER: **Budi Hidayat**, Universitas Indonesia
AUTHORS: Judite Gonçalves, Taufik Hidayat, Royasia Viki Ramadani, Thomas Hone, Nur Cahyadi

Background: Demand-side health financing (DSF) includes mechanisms that improve access to healthcare by providing incentives directly to consumers rather than to providers. Indonesia has shifted funds from fossil fuel subsidies to DSF initiatives benefiting the poor, addressing previous inequities in which supply-side health financing favored the wealthy, and introduced subsidized health insurance for the poor (PBI) and conditional cash transfers (PKH). This study assesses the impact of Indonesia's DSF programs on maternal health-seeking behaviors and financial protection, examining both the individual and combined effects of the PBI and PKH programs—a novel aspect of this research.

Research Gap: While the individual effects of PBI and PKH on healthcare utilization have been studied, their combined impact on maternal and financial protection remains unexplored. This study addresses this gap by assessing the independent and joint effects of PBI and PKH on maternal health-seeking behavior and financial protection.

Research Question: How do the individual and combined effects of the PBI and PKH programs impact maternal health outcomes and financial protection?

Methods: We used a three-wave PKH panel survey to assess the effects of PBI alone, PKH alone, and the combined PBI-PKH intervention compared to a control group. We calculated generalized propensity scores to estimate the conditional probability of DSF participation based on

demographic characteristics, applying a multivalued treatment framework. We then estimated average treatment effects on the treated (ATT) and average treatment effects (ATE) using the population-averaged Generalized Estimating Equations regression models, with inverse probability weights derived from the initial analysis. Outcomes included maternal health-seeking behaviors and financial protection measures).

Key Results: Individual DSF programs had modest impacts, with PKH alone showing often insignificant effects. However, their synergistic combination significantly improved maternal health seeking behaviors ($p<0.01$). The integrated programs led to a 47% (ATT) and 44% (ATE) increase in outpatient visits, a 49% (ATT) and 48% (ATE) rise in skilled deliveries, and a 41% (ATT) and 43% (ATE) increase in facility-based births. Folic acid supplementation and tetanus toxoid immunization rates also improved by 41-44%. Additionally, integrated programs reduced delivery costs by 34% (ATT) and 37% (ATE), lowered out-of-pocket health expenses as a share of household income by 12% (ATT and ATE), and cut total out-of-pocket health expenses by 2%.

Conclusions: Combined subsidised health insurance and conditional cash transfers significantly improves maternal health and financial protection, demonstrating the value of synergistic interventions.

Implications for Policy and Practice: Indonesia's shift from fossil fuel subsidies to funding DSF programs presents a valuable model for other nations seeking to improve health outcomes and financial protection for vulnerable populations. Policymakers should expand combined DSF programs, to improve access and reduce financial barriers for vulnerable populations.

8:30 AM –10:00 AM TUESDAY [Demand & Utilization Of Health Services]

os205 Bali International Convention Centre – Medan

Understanding Mental Health Prevalence, Service Use and Economic Consequences: Evidence from a Multidisciplinary Project in Indonesia

MODERATOR: **Laura Anselmi**, University of Manchester

CONVENER: **Jon Gibson**, University of Manchester

DISCUSSANT: **Risky RKH**,

abs-os663 Evidence on Mental Health Prevalence and Service Use: Indonesia's 2015 2020 National Health Insurance Data

PRESENTER: **Ms. Laura Anselmi**, The University of Manchester

AUTHORS: Alfariany Fatimah, Hasbullah Thabrany, Herni Susanti, Sri Idaiani, Matt Sutton, Dwidjo Susilo, Jon Gibson, Irmansyah Irmansyah, Asri Maharani

Background: Individuals with mental illnesses in Indonesia face significant barriers to accessing care, including stigma, social isolation, limited availability of healthcare providers, and low mental health awareness. Current evidence on mental health prevalence and healthcare utilisation primarily relies on survey and surveillance data, with limited use of register-based data. This study analyses data from the National Health Insurance (BPJS) sample, representing 1% of insured individuals, to assess mental illness prevalence, patient characteristics, and healthcare utilisation. The findings are compared with data from the Basic Health Research Survey (RISKESDAS) to identify gaps from self-reported and diagnosed mental health conditions. **Methods:** Using BPJS sample data (2015–2020), mental illness prevalence was examined by age, gender, and province, with descriptive statistics on healthcare utilisation. Logistic regression was used to assess associations between mental illness diagnoses and individual characteristics such as sex, age, marital status, insurance segmentation, and province. Prevalence and service use findings were compared with RISKESDAS data to evaluate disparities between self-reported and diagnosed mental illnesses. **Preliminary Results:** From 2015–2020, 44 per 10,000 individuals covered by BPJS were diagnosed with mental illnesses. Males (45 per 10,000) had slightly higher prevalence rates than females (42 per 10,000). Prevalence peaked in the 50–54 age group and was highest among non-salaried workers (76 per 10,000). Regionally, Central Kalimantan had the highest prevalence (79 per 10,000), while West Sumatra reported the lowest (9 per 10,000). Logistic regression analysis confirmed these trends. Males were more likely to be diagnosed than females (OR=0.693), while individuals aged 51–60 had higher odds of diagnosis (OR=1.516) compared to the reference group (0–10 years). Non-salaried workers had increased odds of diagnosis (OR=1.729) compared to non-workers, and being married reduced the likelihood of diagnosis compared to being single (OR=0.731). Regional analysis showed that individuals in 12 provinces were less likely to be diagnosed, those in 3 provinces were more likely, and the remaining 18 provinces showed no significant difference compared to Aceh. A difference was observed when comparing BPJS and RISKESDAS data. Self-reported depression prevalence in RISKESDAS (6.1%) was much higher than the diagnosed rate in BPJS data (0.04%). However, differences narrowed for treated depression cases (0.55% vs 0.05%). **Policy Implications:** These findings highlight the need to address regional and demographic disparities in mental health diagnosis and care in Indonesia. The stark contrast between self-reported and diagnosed depression underscores the importance of expanding access to mental health services and improving diagnostic capacity. Policymakers should prioritise regions and groups with high unmet needs, including non-salaried workers and specific provinces, to ensure equitable mental health care.

abs-os669 Mental Health and Labour Market Outcomes: Absenteeism and Presenteeism by Job Type in Indonesia

PRESENTER: **Jon Gibson**

AUTHORS: Ms. Laura Anselmi, Asri Maharani, Matt Sutton, Alfariany Fatimah

Purpose: This study investigates how mental health and job characteristics influence productivity in Indonesia by examining absenteeism (taking time off work) and presenteeism (attending work while unwell). It explores the interplay between mental health status, job type, and workers' attendance decisions. We investigate how different job types and mental health status influence workers' decisions to either attend work while unwell or take time off. **Methods:** We analysed primary survey data from 19,234 Indonesian workers across diverse employment categories. Mental health status was measured using depression (CESD-10) and anxiety (GAD-7) scores, while job types were classified as government, private sector, self-employed, casual workers, unemployed, and retirees. A bivariate probit model was used to jointly estimate absenteeism and presenteeism behaviours, focusing on the interaction between job type and mental health status to identify patterns and moderating effects. **Results:** Absenteeism rates varied across employment categories, with government and private sector employees showing the highest rates (10.9%), followed by self-employed (8.1%) and casual workers (7.9%). Presenteeism was most prevalent among unemployed individuals (19.0%) and retirees (14.7%) but less common in the formal sector (3.6%). Mental health significantly influenced these behaviours, with depression and anxiety increasing the likelihood of absenteeism and presenteeism, though the effects varied by job type. Formal sector employment moderated the impact of poor mental health, reducing its effect on work attendance decisions compared to other employment categories. **Conclusions:** The relationship between mental health and work attendance in Indonesia is mediated by job characteristics. Workers in formal sectors are better protected from the productivity impacts of poor mental health, potentially due to structured workplace policies and support systems. These findings emphasise the importance of targeted workplace mental health interventions, particularly for informal sector workers and unemployed individuals, to address productivity losses associated with absenteeism and presenteeism.

abs-os589 Mental Healthcare-Seeking, Use and Out-of-Pocket Expenditures in Indonesia: Evidence From a Large Community-Based Survey

PRESENTER: **Asri Maharani**, University of Manchester
AUTHORS: Herni Susanti, Hasbullah Thabrany, Dwidjo Susilo, Jack Wilkinson, Jon Gibson, Ms. Laura Anselmi, Sri Idaiani, Ida Ayu Mas Amelia Kusumaningtyas, Mashita Fajri Maysuro

Background: Mental disorders are a growing health burden in Indonesia, with approximately 12 million people experiencing depression. Despite this, data on mental healthcare utilisation remain limited, hindering effective healthcare planning. This study investigates mental healthcare-seeking, utilisation, and out-of-pocket (OOP) expenditures among adults in Indonesia, with a focus on the impact of probable mental health disorders (MHDs) on service use. **Methods:** We conducted a survey of 19,236 adults aged 18+ between July and October 2023. Participants completed the 10-item Center for Epidemiologic Studies Short Depression Scale (CES-D-10) and the 7-item Generalised Anxiety Disorder (GAD-7) tool to screen for depression and anxiety, respectively. Data on help-seeking for mental health issues, treatments received, healthcare costs, and health insurance status were collected. Healthcare insurance was categorized into social, local government, and other types. Respondents with probable MHDs were identified using CESD-10 scores ≥10 and/or GAD-7 scores ≥4. Outpatient and inpatient service utilisation and OOP expenditures were compared between adults with and without probable MHDs. Logistic regression models assessed associations between demographic, socioeconomic factors, insurance ownership, and mental healthcare utilisation among individuals with probable MHDs. **Results:** Approximately 2,119 (11%) respondents sought mental healthcare, with 615 receiving outpatient care and 39 receiving inpatient care. The average OOP cost was IDR140,359 (SD=288,637) for outpatient services and IDR1,372,000 (SD=2,447,296) for inpatient services. Only 36% of outpatient users and 56% of inpatient users utilized health insurance, with social health insurance being the most common. Probable MHDs were identified in 849 (4.42%) respondents with depression, 2,339 (12.17%) with anxiety, and 602 (3.13%) with both. Help-seeking was more frequent among those with probable MHDs (19%) compared to those without (10%), and OOP costs for outpatient care were significantly higher for respondents with probable MHDs. Logistic regression showed that social health insurance (OR=1.63; 95% CI=1.30–2.06), local government insurance (OR=1.72; 95% CI=1.10–2.69), and other insurance types (OR=2.95; 95% CI=1.86–4.67) increased the odds of help-seeking among individuals with probable MHDs. Older age, female gender, and being in the wealthiest quintile were also associated with higher odds of help-seeking. **Conclusions:** The presence of mental health disorders increases healthcare utilisation and OOP costs, highlighting the financial burden on affected individuals. Inequalities persist, with wealthier individuals and those with insurance more likely to access mental healthcare. Policies to expand health insurance coverage, improve access to affordable care, and address disparities are critical to meeting the growing demand for mental health services. Enhanced investment in prevention, promotion, and treatment interventions is recommended to reduce the burden of mental disorders on the Indonesian healthcare system.

abs-os651 Treatment Pathways for Mental Health Disorders in Indonesia: A National Analysis of Care Settings Using Health Insurance Data, 2019 2020

PRESENTER: **Sri Idaiani**
AUTHORS: Ida Ayu Mas Amelia Kusumaningtyas, Herni Susanti, Penny Bee, Alfariany Fatimah, Irmansyah Irmansyah, Jack Wilkinson, Helen Brooks, Asri Maharani, Dwidjo Susilo

Background: Effective management and recovery for individuals with mental health disorders depend on appropriate mental healthcare. In Indonesia, mental health services are provided through both psychiatric and non-psychiatric care settings. However, limited data exist on how mental health conditions are managed across these pathways. Although the Indonesian Mental Disorder Diagnosis Classification Guidelines III (based on ICD-10) provide standardised diagnostic criteria, the extent to which non-psychiatric settings adhere to these standards and deliver care remains unclear. This study explores the distribution of mental health diagnoses across clinical settings and identifies factors influencing treatment pathways in Indonesia. **Methods:** We analysed 4,335 outpatient visits with ICD-10 F code diagnoses recorded in the National Health Insurance Agency (BPJS-K) database from 2019–2020. These data were linked with information from the 2019 Health Facility Research (Rifaskes) on the availability of psychiatrists, clinical psychologists, and mental hospitals. Using multilevel logistic regression, we examined the association between disorder types, provider availability, and the likelihood of receiving treatment in psychiatric versus non-psychiatric settings. Adjustments were made for demographic factors, marital status, BPJS insurance segmentation, and healthcare provider availability. **Results:** Of the patients studied, 75.5% (n=3,275) received treatment in psychiatric clinics. However, patients with psychological development

disorders were significantly more likely to receive care in non-psychiatric settings (adjusted odds ratio [AOR] 217.0; 95% CI 120.5–390.9). Similar trends were observed for childhood-onset behavioural and emotional disorders (AOR 43.0; 95% CI 24.3–77.7) and organic mental disorders (AOR 7.49; 95% CI 4.63–12.12). The likelihood of receiving treatment in non-psychiatric settings was higher in type A hospitals (AOR 31.97; 95% CI 9.46–106.83), type C hospitals (AOR 1.78; 95% CI 1.01–3.13), and other hospital types (AOR 4.16; 95% CI 1.68–10.28) compared to mental health specialist hospitals, with no significant differences observed for type B or D hospitals. **Conclusion:** Most patients with mental health disorders in Indonesia are treated in psychiatric clinics. However, specific diagnoses, such as psychological development disorders, childhood-onset behavioural disorders, and organic mental disorders, are more frequently managed in non-psychiatric settings. These findings reveal gaps in Indonesia's mental healthcare system, particularly for complex cases requiring specialised care. Strengthening referral systems and improving access to mental health specialists are essential to minimise these gaps.

8:30 AM –10:00 AM TUESDAY [Health Care Financing & Expenditures]

os207 Bali International Convention Centre – Hibiscus

Securing the Future: Demonstrations of Leveraging Fiscal Space Opportunities for a Sustainable HIV Response Post-2030

MODERATOR: **Gesine Meyer-Rath**, Health Economics and Epidemiology Research Office, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg

CONVENER: **Elise Smith**, Genesis Analytics

DISCUSSANT: **Nthabiseng Khoza**, National Department of Health

abs-os543 Integration of HIV services with Primary Healthcare: Economic Perspectives and Lessons for Planners and Practitioners

PRESENTER: **Elise Smith**, Genesis Analytics
AUTHORS: Aisha Abdulkadir Muazu, Ibrah Seninde, Kiprotich Cheruiyot, Carl Shutte

Background: Global evidence indicates that integrating HIV services with other health programs enhances health outcomes, improves health system efficiency, and is generally cost-effective. As countries move closer to epidemic control, and in the face of declining international funding for HIV programs, it is increasingly recognized as an important strategy for building a more sustainable HIV response and supporting progress toward universal health coverage. However, the majority of evidence is based on integration pilot projects and there is little evidence on how these integration processes are implemented, especially for integrating health systems more broadly, and what the financial implications of full integration might be.

Methods: We conducted country case studies on HIV integration efforts that have been piloted or implemented in Kenya, Malawi, South Africa, Uganda and Tanzania, and Zimbabwe. Data was collected through key informant interviews and from published literature to understand how the integration of HIV services with PHC impacted on the cost of service delivery, and how the process of HIV integration unfolded, focusing on the entire health system and enabling environments. Qualitative and quantitative data was analysed to distil key insights and lessons learned from country experiences with integrating HIV services to inform and improve future health service integration initiatives.

Results: Our research shows that the cost implications of HIV integration are highly variable and context-specific, even within a single country. While integration generally results in efficiencies, such as improved utilisation of human and capital resources that lead to unit cost savings, these do not necessarily translate into total cost or budget reductions. In some cases, higher direct costs, particularly for diagnostics, supplies, and drugs, were observed, often reflecting the delivery of higher-quality services, especially in research-driven pilot projects. However, the broader cost implications at the above-facility level and across health systems remain unclear due to limited research, as most available studies are small-scale pilots. Additionally, there is a significant gap in understanding the upfront investments required for integration at both service delivery and systems levels, despite indications that these investments may be substantial. A key outcome of this research is a comprehensive pathway to integration, which highlights critical considerations for country decision-makers and planners throughout the entire integration process. These considerations address alignment with broader health system goals, health system readiness, affordability, and sustainability.

Conclusion: HIV integration presents both opportunities and challenges, with implications for resource use and sustainability. While integration can enhance service quality and efficiency, its cost and budgetary impacts are highly context-specific and often necessitate substantial upfront investments. Addressing key gaps in research, particularly regarding above-facility costs and systems-level resource requirements, is essential to inform scalable integration strategies. Practical insights from this research can guide countries in aligning integration plans with broader health system strengthening goals, offering actionable steps to support the UNAIDS sustainability roadmap and the transition from vertical programs to integrated models.

abs-os573 Macro-Fiscal Trends and HIV Financing: Evidence on Fiscal Space and Domestic Ability to Pay in Four African Countries

PRESENTER: **Steve Cohen**, Genesis Analytics
AUTHORS: Carl Shutte, Elise Smith, Kiprotich Cheruiyot, Sergio Torres Rueda

Background

Low- and middle-income countries (LMICs) in Sub-Sahara Africa face substantial challenges in increasing domestic funding for HIV programs as donor investments in health decline. Contributing factors include sluggish economic growth, high debt burden, competing development priorities and inefficient revenue collection mechanisms. Between 2024 and 2030, debt service costs are projected to consume, on average, over 54% of tax revenues in the sub-Saharan African (SSA) region.

The decline in donor investments has placed additional strain on domestic systems, which often lack the institutional and financial capacity to fill funding gaps. We present evidence to enable countries and their development partners to plan and execute a managed HIV financing transition, based on a realistic assessment of domestic ability to pay for essential services and functions, and a better understanding of realistic opportunities to increase fiscal space for health and HIV.

Methods

We applied a mixed methods approach that included a qualitative synthesis of evidence, thematic analysis from key informant interviews and quantitative analysis of financial and non-financial data including key health financing indicators in 3 countries, namely Malawi, South Africa and Zimbabwe. We modelled future funding values by external and domestic sources for HIV based on assumptions and scenarios developed.

Results

We found that the study countries were all challenged by high debt servicing costs, constrained budgets and reduced fiscal space for health initiatives. Additionally, we found that low GDP growth projected in the majority of the study countries is limiting resource mobilisation; exacerbated by population growth expanding at a higher rate than GDP growth in some of the study countries. We determined that inefficient revenue collection systems, inflation and currency volatility increased the cost of imported medical supplies, reducing purchasing power, and making donor-funded programs more expensive. Our HIV funding projections demonstrated that in Malawi and Zimbabwe, donor investments in HIV will be required in the long term even if the countries increase domestic financing and find efficiency savings under an optimistic scenario.

Conclusions: Donor policy on HIV financing transitions should consider not only epidemiological and programmatic factors, but also a data-driven assessment of a country's ability to pay for essential HIV services and functions over a long-term timeframe. Governments and their development partners must collaborate to align investments to sustain HIV gains whilst setting data-driven commitments for increased domestic responsibility for HIV financing as domestic ability to pay changes over time.

abs-os570 More Health for Money: Finding Efficiencies in National and Sub-National HIV and TB Programmes in Times of Constrained Domestic Funding

PRESENTER: **Ibrah Seninde**
AUTHORS: Sajid Sherif, Nthabiseng Khoza, Steve Cohen

Background

Despite the South African Government historically contributing over 70% of total funding for the HIV response annually, the increase in treatment coverage has strained the public health budget, with a notable increase in the HIV/AIDS budget, from R8,8 billion in 2010/11 to R23,5 billion in 2022/23. Anticipating an additional 2 million people to enrol on life-long ART by 2027, financial demands will increase, whilst resources for health are expected to remain severely constricted due to macro-economic and fiscal realities. This underscores a pressing need for the government to enhance the efficiency of its HIV programme to sustain its gains towards achieving and maintaining the 95-95-95 targets. We present a case study which demonstrates how more health for money can be achieved through optimising HIV programme allocations and protecting baseline HIV budgets during periods of fiscal austerity, using economic evidence and related advocacy approaches.

Method

We developed a structured process to identify and mitigate weaknesses and inefficiencies in provincial HIV budgeting and spending activities. This process included the following steps: needs assessment for grant managers, diagnostic assessment of provincial budgets and spending activities, development of tools and analytical solutions, capacity strengthening of key officials, monitoring of provincial budgeting and spending for HIV and annual adaptive management.

Results

The intervention produced tools and solutions that included an integrated financial and non-financial budget planning tool, performance management dashboards, root-cause analysis method for spending variances and budget execution rates, and capacity building self-assessments.

Conclusion

This case study demonstrates how leveraging integrated financial and non-financial HIV data analytics for adaptive grant management and sub-national performance management combined with targeted PFM improvement strategies can optimise health spending, ensuring "more health for money" in the context of constrained sub-national HIV budget allocations.

os224 Bali International Convention Centre – Jakarta A

AI, Digital Health and Platforms: Evaluation and Learnings for Global Health

MODERATOR: **Divya Srivastava**, London School of Economics & Political Science

DISCUSSANT: **Luigi Siciliani**, Department of Economics and Related Studies, University of York, York

abs-os616 Gender Biases on Digital Health Platforms: Evidence from India

PRESENTER: **Dweepobotee Brahma**, National Institute of Public Finance and Policy
AUTHOR: Nikita Sangwan

Background: The fast adoption of digital health platforms accelerated by the recent Covid-19 pandemic has transformed the way healthcare services are provided particularly in low-and-middle income countries with limited access to healthcare. While online health platforms have immense potential in increasing access to healthcare, they can also perpetuate and exacerbate gender-based inequalities. Digital platforms make it easier for customers to discriminate against women when the gender can be easily identified from names or profile photographs. The algorithms powering these platforms can reinforce bias if the input data itself contains a gender bias. This paper aims to investigate the gender gaps on digital health platforms in India, which already has a strongly prevalent bias against female professionals. We examine the availability of medical practitioners on a digital health platform, the demand for these practitioners and the engagement of the users with medical professionals in terms of their rates of booking appointments with them. **Methods:**This study uses a novel dataset scraped from *Practo* – a popular online platform for booking doctor consultations in India. *Practo* allows patients to book appointments with doctors across various specializations with filters for the locality. It provides detailed information about doctors, including their specialization, years of experience, consultation fees, patient ratings, and availability. Our scraping tool was programmed to extract the details of the doctors (Unique ID, Gender, Specialization, Years of Experience, Consultation Fees, Patient Ratings (average rating, number of reviews), Location (city, clinic) and Availability (days and hours of consultation) by the locality. We follow the physicians on this platform over a month to track their booked consultations. The final dataset comprises information on 25,466 doctors from six major cities in India. We employ fixed effects linear regressions to tease out the differences across male and female physicians over several dimensions including consultation fees, ranking on the platform, booking rates and reviews on the platform while controlling for a host of several other characteristics. **Results:** Overall, preliminary results indicate strong gendered effects across multiple outcomes indicating the presence of systematic bias against female physicians. Female physicians are ranked lower on the platform compared to their male counterparts even after controlling for specializations, qualifications, consultation fees. Female physicians are also rated lower (measured through recommendations and reviews) by patients and have systematically lower appointment booking rates compared to male physicians after controlling for other characteristics. However, we find no significant difference in consultation fees especially within specializations. Future analysis will delve deeper into these results through statistical decomposition methods. **Conclusion:** The contributions of this paper are two-fold. First, it studies the large private practice market in healthcare across major Indian cities for which there is paucity of evidence. Second, it adds to the growing body of literature documenting gender gaps in the highly skilled market for physicians and contribute to our understanding of how market forces and algorithmic forces behind digital platforms interact to perpetuate to gender biases.

abs-os615 Economic Evaluation of AI in the Diagnosis of Breast Cancer: Evidence from a Multi-Centre Study in the UK

PRESENTER: **Divya Srivastava**, London School of Economics & Political Science

Background: Breast cancer is the most common cancer in women globally. Cancer diagnosis is performed through manual, labor-intensive, and subjective histological review of biopsies. In the UK, breast biopsies should be reported within 5 working days; however, this proved to be increasingly challenging, due to a persistent widening gap between demand for testing and pathologist workforce.

The most recent UK survey on the histopathologist workforce reported that only 3% of departments had enough staff to meet clinical demand, with 45% outsourcing services and 50% using locums with additional costs of £27million a year. Artificial Intelligence (AI) could transform the diagnostic landscape by making pathways more efficient, shortening waiting list, reducing subjectivity, and improving health outcomes. However, this technology and its requirements such as set-up costs, maintenance and effectiveness have not been evaluated in England.

Research objectives: This study investigates whether the AI technology to support breast cancer diagnosis is cost effective and its budget impact on the English NHS.

Methods: The AI technology is piloted in five hospitals in England between (July 2024 and August 2025). We use pseudonymised data originating from 7,000 consecutive patients undergoing breast biopsies for the empirical analysis.

We develop a cost-consequence model to evaluate the potential value of the technology. The model processes all the incoming biopsies providing computed-enhanced features, such as heatmaps, region of interest (ROIs), and cancer likelihood scores (i.e. for invasive cancer and ductal carcinoma in situ), to support diagnosis and triage patients. We assume that cancer survivability is linked to the stage of the cancer when detected. General population survivability was based on the Office for National Statistics and life expectancy for each woman is estimated. This is adjusted in the event of the women developing a carcinoma at any stage (i.e. early stage: NPI I, II or III, or advanced). We use the empirical estimates to conduct a budget impact analysis. Published estimates from the literature are used to support the model development including cost estimates, and utility values.

Results: Our preliminary findings reveal a high level of accuracy of the AI technology in ruling in/out cancer, with sensitivity of 100%, specificity of 99.8%, positive predictive value (PPV) of 99.7%, and negative predictive value (NPV) of 100%. The preliminary findings show an increase in volume (50% more patients diagnosed within 5 days) and a 45% reduction in additional immunohistochemistry tests, with consequent reduction of second reviews (pathologist time), lab staff time, and improved patient turnaround time.

Conclusions: With AI a current government priority in health care in England, these findings have important implications for decision-makers and healthcare providers in the NHS. Our findings show that the deployment of AI technology could potentially lead to improvements in health care delivery and improve clinical workflow practices in England in high pressure working environments.

abs-os612 Surfing in Australia: Internet Access and Productivity in Healthcare

PRESENTER: **Ms. Susan Méndez**, University of Melbourne

AUTHORS: Diana Contreras Suárez, Arezou Zaresani

Background: Broadband infrastructure, which provides high-speed internet, facilitates faster data access and processing, enables real-time communication and collaboration, and fosters the adoption of cutting-edge technologies, all of which should improve overall productivity, in particular in information-intensive industries, like healthcare. **Research Question:** This study investigates the impact of high-speed internet access on the productivity of general practitioners (GPs) in Australia, as measured by their volume of consultations and practice styles. **Methods:** We use the time discontinuities in access to high-speed internet created by the slow rollout of the National Broadband Network (NBN) across Australia. We use detailed GP-level data from the Medicine in Australia: Balancing Employment and Life (MABEL) national longitudinal survey of doctors linked to their practice location and administrative records of their service provision from the Medicare Benefit Schedule (MBS) and Pharmaceutical Benefit Scheme (PBS). We estimate a dynamic event study model that addresses the challenges of staggered treatment timing and potential contamination of estimated coefficients in conventional Two-Way Fixed Effects models, providing unbiased estimates of the causal effects of NBN availability on GP productivity. **Results:** This presentation studies the impact of access to high-speed internet on GPs' volume of consultations, prices and practice styles, proxied by prescription rates and discusses the consequences that investments in high-speed internet infrastructure and the promotion of digital technologies in primary care settings could potentially have in healthcare delivery and efficiency.

8:30 AM –10:00 AM TUESDAY [Health Care Financing & Expenditures]

os28 Bali International Convention Centre – Bougainville

Advances in Risk Adjustment and Consumer Choice: Balancing Fairness, Efficiency, and Policy Design in Health Insurance Markets

MODERATOR: **Francesco Paolucci**, University of Bologna

CONVENER: **Lukas Kauer**, University of Lucerne

abs-os382 A Dynamic Model for Private Health Insurance in Australia: Optimal Settings for Costs to Government and Consumer Welfare

PRESENTER: **Michael McLean**, Finity Consulting Pty Australia

Government policy currently seeks to incentivize participation in private health insurance (PHI) in order to alleviate financial pressure on public hospitals. This objective is pursued through three primary policy instruments: the Private Health Insurance Rebate (rebate), the Medicare Levy Surcharge (MLS), and the Lifetime Health Cover (LHC) loading. The rebate provides a percentage subsidy on insurance premiums, with the rate varying according to an individual's income, age, and family type. The MLS imposes a tax surcharge on individuals whose income exceeds a specified threshold and who choose not to maintain hospital cover. The LHC imposes a 2% surcharge on premiums for each year an individual over the age of 30 does not hold hospital cover. The rebate constitutes a significant cost to the federal budget, amounting to approximately $7 billion annually, while the MLS also represents a loss of tax revenue for the government due to individuals with health insurance being exempt from the surcharge. Numerous studies have criticized these incentives, arguing that the benefits of the small increase in PHI participation resulting from these policies is outweighed by the cost. However, a recent report commissioned by the Department of Health and Aged Care, utilizing extensive industry claims data, calculated the net fiscal impact of the rebate and MLS. The report concluded that these incentives generate net savings for the government. Specifically, the healthcare costs the government would incur in the public hospital system for individuals without PHI are outweighed by the costs associated with the rebate and the tax forgone through the MLS. Additionally, the report examined the broader social costs of PHI enrolment, noting that while the policies may reduce government healthcare expenditures, they could impose costs on society. The methodology underlying this analysis relied on several assumptions, including the absence of moral hazard, adverse selection, a static PHI market, and constant participation rates, with the aim of estimating net impacts rather than identifying opportunities for policy improvement. The present study seeks to build upon this recent analysis by incorporating demand elasticity estimates derived from an economic choice experiment to develop a dynamic model of the PHI system. The dynamic model will incorporate realistic assumptions, including adverse selection, moral hazard and elasticities of premiums and regulatory tools. The model will use a set of input policy parameters, such as the rebate and MLS rates, and integrate them with predictive models for healthcare costs. These models will be applied to the Australian population to generate updated estimates of PHI enrolment patterns and net government and social costs. This model will enable a comprehensive assessment of the net costs to government and the broader social costs under a wide range of policy scenarios. Ultimately, this study aims to identify policy scenarios that improve upon the current system, particularly in terms of reducing the net costs to government and minimizing the social costs of PHI enrolment.

abs-os18 Can Risk-rating of Incremental Premiums Improve Consumer Sorting Across Coverage Options in Mandatory Health Insurance Markets?

PRESENTER: **Josefa Henriquez**

AUTHORS: Francesco Paolucci, Richard C van Kleef, Marcello Antonini

Community rating in mandatory health insurance schemes is common for fairness reasons, but its known that it causes inefficient consumer sorting across coverage options, affecting welfare. This study explores if risk rating of incremental premiums can enhance sorting efficiency. Specifically, it evaluates the effects of risk rating on consumer choices between basic and more comprehensive coverage options, using data from Chile's private health insurance market. The research addresses the central question: Can risk rating for more comprehensive coverage improve consumer sorting in mandatory insurance markets?

This study employs the "EFC" graphical framework (Einav, Finkelstein & Cullen, 2010) and simulation-based modeling using Chilean health insurance data. Three scenarios are simulated: (1) a baseline without moral hazard and perfect risk adjustment, (2) includes moral hazard, and (3) adds both moral hazard and imperfect risk adjustment. The sample includes ~2m individuals with data on demographics, health expenditures, and plan types. Particularly, the paper models the curves that characterise market equilibrium in mandatory health insurance: incremental marginal costs, willingness to pay (WTP), and average costs (AC) curves across different premium settings.

Results show that under perfect risk adjustment, risk rating of incremental premiums can improve consumer sorting. With imperfect risk adjustment the welfare effects of risk rating are less clear as incremental premiums will not just reflect the direct effect of more comprehensive coverage on healthcare spending but also the under/overcompensations from the (imperfect) risk adjustment system.

This has important policy implications since state-of-the-art risk adjustment models do not perfectly compensate for unpriced risk heterogeneity regarding basic coverage. While a hybrid approach—community rating for basic coverage and risk rating for incremental premiums—may balance fairness and efficiency, our key finding reveals that the effectiveness of this approach depends on the quality of risk adjustment in basic coverage and the degree of correlation between consumers' preferences for additional coverage and their basic coverage costs.

abs-os45 Improving Risk Adjustment with Limited Availability of Morbidity Data the Case of Switzerland

PRESENTER: **Lukas Kauer**

AUTHORS: Christina Vetsch-Tzogiou, Reto Bürgin, Michael Stucki

Objectives

Risk adjustment (RA) schemes in health plan payment are designed to curb the incentive for risk selection among insurers. The Swiss RA has been refined several times since its introduction in 1996. The latest reform in 2020 introduced a new risk adjustor, pharmaceutical cost groups (PCG), which captures the use of prescribed drugs for chronic diseases. The aim of this study was to assess the performance of the different RA models, their potential impact on the incentives for risk selection, and to discuss the potential policy implications.

Methods

We used two data sets, covering the entire adult population (6.99 m in 2022), and containing information on health insurance, healthcare spending, medication use, and demographic factors. We compared the model performance of five different RA models in use since 2014, examining individual-level spending predictions and over- or undercompensation. We also explored whether the current RA scheme offers possibilities for risk selection by investigating spending variation within similarly compensated individuals.

Results

Performance of the Swiss RA has improved substantially over time. In particular, including information about the use of medication since 2017 increased goodness of fit. Recent refinements, particularly the inclusion of PCG, led to a considerable reduction in under- and overcompensation in many subgroups. However, several of the currently used PCG exhibited significant spending variation which may offer new potentials for risk selection.

Discussion

Reforms of the Swiss RA scheme have continuously reduced the incentives for risk selection and improved the prediction of spending. As new potential for risk selection might arise, the regulators should closely monitor the behaviour of insurers. The next steps in reforming the RA involve finding new indicators that capture morbidity not yet considered in the current RA scheme.

8:30 AM –10:00 AM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

os3 Bali International Convention Centre – Frangipani

The Adaptive Advantage: The Role of Adaptive Health Technology Assessment in Priority Setting

CONVENER: **Alexander Morton**, National University of Singapore School of Public Health

DISCUSSANT: **Yangmu Huang**, Peking University

abs-os2 How Good is Good Enough?: A Simulation Study of Adaptive HTA

PRESENTER: **Jamaica Roanne Briones**
AUTHORS: Peter Baker, Ms. Wanrudee Isaranuwatchai, Alexander Morton

Adaptive Health Technology Assessment (aHTA) offers a context-sensitive and efficient alternative to full HTAs, particularly valuable for small countries and resource-limited settings. This study evaluates the impact of uncertainty on aHTA decision-making and identifies factors contributing to high levels of uncertainty. We conducted simulations to derive an aHTA Incremental Cost-Effectiveness Ratio (ICER) by sampling ICERs from systematic reviews of selected technologies and performing pragmatic ICER adjustments. The uncertainty in aHTA ICERs was assessed using a threshold-based decision rule to evaluate the accuracy of reimbursement decisions. This involved comparing aHTA ICERs with a distribution modelled on SRs against a baseline ICER from studies conducted in Thailand, our reference country. Additionally, we quantified the financial impact of implementing an aHTA strategy.

Results indicate that aHTA performance is situationally dependent. The aHTA ICER is most reliable when it is significantly different from the WTP threshold—either significantly below or above it. Lower variability between studies increases confidence in the aHTA ICER, especially when the studies included in the simulation have a similar evaluation framework. In terms of net monetary impact, it may be prudent to balance the need for evidence when there is a low or moderate risk of uncertainty with the decisions based on uncertain evidence, particularly when technologies have a low budget impact, thereby reducing the risk of decision errors. Furthermore, aHTA ICER adjustment methods, such as price correction, show promise in scenarios where they can reduce variability between studies hence lower the risk of incorrect decisions.

Our findings support previous research suggesting that aHTA methods are appropriate when certain conditions are met, such as certainty in economic evidence and a lower budget impact. This study provides quantitative evidence reinforcing the potential value of aHTA as a complement to a country's toolkit for prioritising technologies for full HTA. Nonetheless, it is essential for countries to build the capacity to conduct comprehensive HTAs, especially for strategically significant technologies.

abs-os12 Adaptive HTA in India: A Pertuzumab Case Study

PRESENTER: **Akshita Vikani**, TBA
AUTHORS: Anuja V R, Sajith Kumar S, Tom Drake, Abha Mehndiratta, Anamika Dhiman, Tabassum Wadasadawala, Seema Gulia, Manju Sengar, C S Pramesh

Background

The National Cancer Grid (NCG) of India has established a team of health economists to conduct and institutionalize adaptive Health Technology Assessments (HTAs). These adaptive HTAs aim to support evidence-informed decision-making in resource-stratified guideline development and national health benefit package (HBP) decisions. This abstract presents a case study assessing the cost-effectiveness of pertuzumab, used as neoadjuvant therapy in combination with trastuzumab and chemotherapy for Human Epidermal Growth factor Receptor- 2 (HER2) positive operable, inflammatory, or locally advanced breast cancer. Although pertuzumab has received regulatory approval from the Central Drugs Standard Control Organisation (CDSCO), European Medicines Agency, and Canada's Drug Agency, cost-effectiveness evidence for its use in India remains lacking. An economic evaluation was deemed essential to inform the potential inclusion of the intervention within the NCG's resource-stratified clinical guidelines and the Health Benefit Packages (HBPs) under the Ayushman Bharat–Pradhan Mantri Jan Arogya Yojana (AB-PMJAY).

Aim

This study aimed to apply an adaptive HTA methodology to assess the cost-effectiveness of pertuzumab as neoadjuvant treatment for HER2 positive operable, inflammatory or locally advanced breast cancer

Methods

Using the methodology outlined in the National Health Authority's adaptive HTA manual, we searched for relevant evidence across HTA agencies, PubMed, and the Tufts cost-effectiveness registry. Cost and clinical effectiveness data were adjusted for inflation, purchasing power parity, and life expectancy differences, and standardized to 2023 Indian Rupees. Adjusted incremental cost-effectiveness ratios (ICERs) were calculated using data from three HTA reports (UK, Canada, Malaysia) and four economic evaluations (Canada, USA, Singapore, Italy).

Results

Pertuzumab's incremental costs outweigh its health benefits in all but two studies (Singapore and Italy). The adjusted ICERs exceeded India's cost-effectiveness threshold of one GDP per capita, suggesting that pertuzumab is not cost-effective for the Indian healthcare system.

Conclusion

Through this study, we have taken initial steps toward institutionalizing adaptive Health Technology Assessments (HTAs) within the National Cancer Grid (NCG). By applying the adaptive HTA approach to evaluate the cost-effectiveness of pertuzumab for HER2-positive breast cancer, we have demonstrated its practical utility in addressing local evidence gaps. This approach not only informs clinical guideline development and health benefit package (HBP) decisions but also lays the groundwork for broader adoption of adaptive HTAs at the national level. Our findings highlight the potential of adaptive HTAs to support evidence-informed policymaking and enhance the efficiency and equity of health care delivery in India.

abs-os14 iDSI Guide to Rapid Review of International HTA Reports: An Adaptive HTA Method

PRESENTER: **Peter Baker**, Center for Global Development
AUTHORS: Andrés Pichon-Riviere, Javier Guzman, Daniel A Ollendorf, Lieke Fleur Heupink, Shankar Prinja, Srobana Ghosh

Background In the past two decades, health technology assessment (HTA) has become integral in determining the services provided by publicly funded health systems, especially in low- and middle-income countries (LMICs). However, LMICs face significant challenges in formalizing the entire HTA process and conducting full HTA appraisals due to the urgency of funding decisions, limited technical capacity, and constrained data. These hurdles necessitate an alternative approach to ensure timely, evidence-based decision-making. This field is known as adaptive HTA (aHTA), but no current global guidance on best practices for aHTA exists. *Aim* This paper aimed to develop guidance for a novel adaptive HTA method to simplify the HTA process in resource-limited settings. *Methods* We reviewed the aHTA literature including case studies from the iDSI network in Romania, India, Indonesia, and Ghana. Workshops were held with experts in the field to further develop and refine the method. *Findings* We developed a method called the *"Rapid review of international HTA reports"*, that focused on international HTA reports and cost-effectiveness analyses (CEAs) from other countries. The key steps in this process include, 1) scoping: aligning the decision problem with relevant international evidence; 2) evidence acquisition: identifying and extracting data from HTA reports and CEA studies; 3) supporting analyses: price benchmarking, treatment cost calculations, and budget impact assessments; and 4) synthesising results and recommendations: translating the findings into locally relevant recommendations. We provide optional modules for contexts where additional evidence or analyses are required, such as systematic reviews or evaluations of the transferability of international economic data to the local setting. *Conclusion* The rapid review aHTA framework offers a structured yet flexible approach that enables LMICs to adapt international HTA evidence to local conditions. By utilising HTAs from other countries, LMICs can benefit from the technical capacity and high-quality evidence already available internationally. This approach significantly reduces the time and resources needed for full HTA while still delivering robust data for decision-making. The *Rapid review of international HTA reports* methodology represents a practical and efficient alternative to traditional HTA in LMICs. While it has limitations, such as the potential for incomplete adaptation to local contexts, it offers a rapid and feasible solution for evidence generation. This approach can play a crucial role in informing national policies on universal health coverage and prioritisation of essential health services. The guide provides a standardised method to empower LMICs to make better-informed decisions in public health resource allocation.

abs-os46 Enhancing Timeliness of HTA for Decision Makers: Experience in Adopting Adaptive Approaches in Indonesia

PRESENTER: **Auliya A. Suwantika**
AUTHORS: Ahmad Irsan A. Moeis, Lusiana Siti Masytoh, Ery Setiawan, Miftah Miftahussaadah, Panji Fortuna Hadisumarto, Putri Listiani, Mardiati Nadjib

Background

Health technology assessment (HTA) is critical in selecting healthcare service benefit packages for Indonesia's national health insurance program (*Jaminan Kesehatan Nasional*/JKN). Established in 2014, the Indonesian Health Technology Assessment Committee (InaHTAC) uses HTA to evaluate health technologies in the potential inclusion of benefit packages.

Aim

This study assessed the development and implementation of adaptive HTA (aHTA) methodologies (i.e., rapid review and CEA) in Indonesia by investigating how these approaches could improve the efficiency, timeliness, and decision-making process for including cost-effective and affordable health technologies under the JKN program.

Methods

A case study was employed to track the aHTA process and application in real-time decision-making, evaluating its role in facilitating the inclusion of high-value technologies in the JKN program. Challenges were identified and analyzed, with lessons learned contributing to refining aHTA methodologies. A comparative analysis was also performed to evaluate the efficiency of aHTA relative to traditional HTA processes.

Results

A pilot for aHTA using rapid review was conducted in 2023 to evaluate pembrolizumab for non-small cell lung cancer, examining the feasibility of using aHTA for inclusion decisions. A method featured a streamlined review process, leveraging secondary data and expert opinions, and resulted in an accelerated timeline. Evidence from international HTA agency databases, chosen considering that these results have undergone rigorous processes, were applied. However, the transferability of these HTA reports became an issue because they came from high-income countries with different contexts from Indonesia. While data on clinical effectiveness might be transferable, differences in health systems and service delivery limited the transferability of available economic evaluation models. In addition, the biggest identified challenge was the methods did not always inspire confidence among stakeholders, which might be caused by limited and uncomprehensive information about this novel method. Nevertheless, several advantages were also identified, such as the relatively uncomplicated aHTA method and the ability to produce results relatively quickly for government decision-making with some transferability consideration, including the optimal cost-effectiveness value using a value-based pricing approach.

Conclusions

Despite the challenge of aHTA implementation in Indonesia, several advantages were identified during the pilot study. Hence, collaborative efforts to strengthen this new method in further discussions with key stakeholders regarding the transferability and generalizability of these

systematic and multidisciplinary evaluations are essential, including for assessing new medical technologies.

8:30 AM –10:00 AM TUESDAY [Health Beyond The Health System]

os48 Bali International Convention Centre – Jakarta B

The Contribution of Health Economics in a Changing Climate: Understanding Impacts and Adaptation

MODERATOR: **Paula Lorgelly**, University of Auckland

CONVENER: **Mark Harrison**, University of British Columbia

abs-os247 Climate-Vulnerable Communities in Fiji: Priorities to Adapt and Thrive Amidst Climate Change

PRESENTER: **Duncan Mortimer**, Monash University
AUTHORS: Rohan Sweeney, Amelia Turagabeci

Background: Each year, over 50,000 people in the Pacific are displaced due to climate impacts and natural disasters. Communities face difficult choices: stay and adapt, relocate, or defer relocation - each with significant implications for health and well-being.

Pacific Island communities are highly vulnerable to extreme weather events and gradual climate changes that damage homes, degrade land, and disrupt livelihoods like fishing and farming. These impacts heighten the risk of injury and illness and further threaten physical and mental health by disrupting traditional ways of life. Relocation may reduce exposure to immediate physical risks but introduces challenges such as displacement, financial insecurity, and loss of cultural identity, which can harm psychosocial health.

In Fiji, 50 villages have been identified for potential relocation within the next 5 to 10 years. Many more communities must adapt as climate change disrupts their living conditions. However, little quantitative research exists on community preferences for where and how to live in the face of such challenges. Understanding these priorities is important for designing adaptation and relocation policies that address community needs and minimize psychosocial impacts.

Methods: We conducted a discrete choice experiment with 630 adults from 25 climate-vulnerable Fijian communities to evaluate preferences for living with climate change. Attributes were informed by literature and 9 focus groups, separated by age and gender, conducted across 4 communities (October 2023).** Respondents completed 9 hypothetical choices between two future living-situations. Living-situations were unlabelled and characterized by the following attributes: (i) location (stay-put, stay-put with significant adaptation, or relocate to a location chosen by the government or the community), (ii) access to fresh and healthy food, (ii) work opportunities, (iii) proximity to services, (iv) affordability and stress, (v) exposure to storm and tide disruptions, (vi) housing type, and (vii) connection to culture, community, and land.

Results: Approximately 60% of respondents reported recent climate-related damage to property or income, with 50% anticipating a possible or likely need to move within the next 10 years. Preliminary analyses revealed that location was the main driver of preferences. Respondents strongly opposed government-selected relocation sites, preferring to stay in their current community with significant adaptation, followed by relocation to a community-chosen site. Housing type also mattered, with respondents even preferring detached, storm-vulnerable dwellings over modern apartments. Reducing exposure to storm and tide disruptions ranked highly, while job type and commuting distance were less important. Of note, health-related attributes, such as proximity to health services and access to healthy food, were lower-order priorities.

Preference heterogeneity emerged: younger adults (under 40 years) were more willing to relocate to community-selected sites and prioritized reducing exposure to storm and tide disruptions, while older adults (over 40 years) valued maintaining community connections more highly.

Conclusion: This research provides insights into the priorities of climate-vulnerable communities in Fiji, emphasizing the importance of community-driven relocation and local adaptation to mitigate climate change impacts. These findings can inform policies aimed at enhancing the resilience and well-being of Pacific Island communities.

abs-os39 Estimating The Economic Impacts of Extreme Weather Events on Healthcare Systems A Scoping Review

PRESENTER: **Nazafarin Esfandiari**
AUTHORS: Glory Apantaku, Sarah Batke, Mr. Mark Harrison

Background: Climate change-induced extreme weather events – such as floods, heatwaves, and wildfires – have been escalating in frequency and intensity globally, posing challenges to various sectors, including healthcare. The healthcare sector is uniquely vulnerable to these events, experiencing direct consequences in the form of increased healthcare demand due to injuries, illnesses, and mental health issues, as well as indirect effects such as disruptions to healthcare infrastructure. While the health implications of extreme weather events are well documented, there is perceived to be a gap in comprehensive methodologies for estimating their economic impacts on healthcare systems. Therefore, there is currently uncertainty about how and whether to incorporate environmental costs and benefits into the evidence presented to decision-makers, and where evidence is presented, there is a wide variation in the factors included in these assessments and the quality of evidence presented.

Objective: This scoping review aims to understand current approaches to conducting economic assessments of the impacts of extreme weather

events on healthcare systems.

Methods: The electronic databases (including MEDLINE, Web of Science, and SCOPUS) were searched for articles published from database inception to May 2024 using search terms developed in consultation with expert librarians. Targeted searches of the grey literature supplemented searches of the published literature. The search strategy comprised a combination of terms capturing extreme weather events (e.g., various types of events) and their economic impacts on healthcare systems (e.g., healthcare utilization costs).

Results: The review of the literature is ongoing, but to date, the titles and abstracts of 9,438 unique studies have been screened, and data has been extracted from 30 studies. All studies have been published since 2011, with 76% published in the last five years, and most studies (60%) focused on regions of Australia and the US. The studies covered extreme heat/heatwave (n=13), flood (n=4), wildfire (n=3), extremes of heat and cold (n=6), extreme cold (n=1), typhoon (n=1), and multiple events (n=2), and they mostly applied a healthcare system perspective. However, there is little consistency in their operationalization. While some studies considered effects as narrow as emergency department visits for specific illnesses, the majority only considered hospital and emergency department visits and only for specific illnesses like respiratory diseases or urinary tract infections, and few considered the cost of impacts beyond healthcare utilization such as lost income, mortality, or wellbeing. The data sources varied markedly between studies, ranging from self-reported survey data to local and national administrative datasets. Critically, none of these studies referenced any framework for reporting the economic costs of climate events to the health system.

Conclusions: As a body of evidence, there is a methodological gap that points to a lack of consistency and comprehensiveness in the impacts assessed and data quality. Developing a comprehensive approach that enables the understanding of the immediate and long-term economic consequences of extreme weather events can enhance the resilience of health systems by informing targeted interventions and policies that mitigate vulnerabilities.

abs-os249 Public Preferences for Environmentally Responsible Healthcare

PRESENTER: **Sandy Tubeuf**, Université Catholique de Louvain
AUTHOR: Charlotte Desterbecq

The relationship between health and the environment is complex and mutually influential. Environmental factors are significant contributors to health challenges, mental health issues, and premature mortality. Paradoxically, the healthcare sector itself is a major source of pollution, generating greenhouse gases, particulate matter, plastic, and pharmaceutical waste that degrade air, water, and soil quality. Addressing these dual challenges requires not only developing sustainable healthcare models but also understanding public willingness to engage with environmentally responsible healthcare practices.

This presentation reports on an original and pioneering on-going study that explores public attitudes toward sustainable healthcare. While research on consumer preferences for sustainability in sectors such as sustainable fish, eco-tourism, organic food, or reduced meat consumption is well-established, the healthcare sector remains underexplored. This research is the first of its kind to systematically investigate public preferences in the healthcare context, setting the stage for further inquiry into this critical area.

This presentation covers three key components of this research project. First, a scoping review was conducted to map empirical studies on population preferences for environmentally responsible choices in healthcare. This review revealed broad public support for integrating environmental considerations into healthcare decision-making. However, clinical effectiveness and disease severity consistently outweighed sustainability concerns, highlighting the complexities of aligning environmental and health priorities.

Second, group interviews with healthcare users provided qualitative insights into their perceptions of climate change, healthcare-related pollution, and their potential roles in reducing such pollution. Participants widely recognized climate change as an urgent environmental and human health threat and reported engaging in pro-environmental behaviors in their personal lives. However, awareness of the healthcare sector's environmental impact was limited. Participants emphasized the need for targeted information campaigns to raise awareness among both healthcare users and providers. Key barriers identified included low public willingness to accept environmental trade-offs in health-related decisions and ethical concerns about shifting the burden of environmental responsibility onto individuals.

Finally, the presentation outlines the design of a discrete choice experiment (DCE) that builds on the findings of the scoping review and group interviews. The DCE is structured to explore the trade-offs individuals are willing to make when choosing between hypothetical healthcare treatments with varying attributes, such as clinical effectiveness, cost, and environmental sustainability. The DCE protocol and structure, including the design of choice sets and data collection strategies, are currently under development. It targets a nationally representative sample of the Belgian population aged 18 to 70, collecting sociodemographic data, health information, and environmental attitudes to provide a rich dataset for analysis. The structure and preliminary results will be presented and discussed during the session.

By integrating findings from the scoping review, group interviews, and DCE design, this original research provides a comprehensive assessment of public attitudes toward sustainable healthcare. It represents a critical first step in addressing a previously neglected area of research. While this study is likely to inspire further investigations, its findings can already inform policies that align clinical excellence with sustainability goals, ensuring a socially acceptable and ethically responsible transition to greener healthcare systems.

10:00 AM –10:30 AM TUESDAY [Social Events]

Bali International Convention Centre – BICC Foyers

Refreshment Break

10:30 AM –12:00 PM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Bali

Economic Evaluations of Non-Communicable Illness

MODERATOR: **Anton Avanceña**,

Ind-1934 Evaluating Cost-Effectiveness of Early Screening and Integrated COPD Interventions in China: An Agent-Based Model

PRESENTER: **Yumei Zhu**
AUTHOR: Yuwei Bai

Background: Chronic obstructive pulmonary disease (COPD) poses a significant burden in China, with current prevention strategies often neglecting individual variability and environmental factors, limiting their cost-effectiveness. Traditional evaluations focus on single interventions, oversimplifying complex dynamics. This study uses an agent-based model to assess the cost-effectiveness of early screening and integrated interventions in China, aiming to develop more targeted and efficient COPD strategies for diverse populations from a healthcare system perspective. Methods: An agent-based model was developed to simulate COPD progression in individuals aged 40–80 years, accounting for individual differences and environmental factors. Early screening strategies, including the COPD Screening Questionnaire and portable spirometry, were evaluated alongside interventions such as influenza and pneumococcal vaccinations, smoking cessation, increased physical activity, and environmental improvements. Four strategies were compared: (1) no screening or intervention, (2) screening only, (3) interventions only, and (4) combined screening and interventions. Key outcomes included quality-adjusted life years (QALYs), costs, COPD-related mortality, and exacerbation rates. Population data were drawn from the national COPD monitoring project, and disease parameters were derived from published studies. Scenario and sensitivity analyses assessed the robustness of key assumptions, while model results were validated against national survey data. Results: The baseline analysis identified annual screening using a combination of the COPD Screening Questionnaire and portable spirometry as the most cost-effective screening strategy. Among single interventions, vaccination demonstrated the greatest effectiveness in reducing COPD prevalence and related complications. At a willingness-to-pay (WTP) threshold of 1–3 times the national per capita GDP, population-wide screening and integrated interventions showed moderate cost-effectiveness compared to no screening or intervention, outperforming screening or interventions alone. Among integrated strategies, combining screening, vaccination, and increased physical activity proved most cost-effective. For high-risk groups, including individuals with comorbidities, smoking habits, or prior disease history, the optimal strategy was annual spirometry screening combined with smoking cessation and vaccination. Conclusions: This agent-based model effectively integrates individual variability and environmental factors, enabling realistic simulations of COPD outcomes. The findings underscore the urgent need to optimize COPD prevention and control strategies in China. Early screening and integrated interventions are pivotal for improving health outcomes. Future efforts should focus on personalized strategies tailored to high-risk subgroups to enhance the precision and cost-effectiveness of prevention measures.

Ind-2027 Economic Evaluation 0f Workplace-Based Hypertension Screening Programme for Public Sectors Employees in Sri Lanka

PRESENTER: **Anuji Gamage**, KDU
AUTHOR: Rohini Seneviratne

Increasing prevalence of non-communicable diseases such as hypertension among employees is a burden to the individual, the family and the country. This reports the cost-effectiveness of implementing annual workplace-based hypertension screening programme among public sector employees **Methods** A linked decision tree model was developed and populated using epidemiological, cost, and health outcome data gathered from various secondary sources which were relevant to the Sri Lankan context to represent pathways, of employees screened and no screening Input model parameters considered an annual hypertension incidence of 2.5%, a screening test sensitivity of 70%, and a current treatment compliance rate of 10%. Costs were estimated for screening (Rs. 1,000 per employee), diagnosis and follow-up for newly diagnosed cases (Rs. 3,500), annual treatment (Rs. 24,000), and CVD-related hospitalizations (Rs. 15,000 per event) alongside productivity losses (Rs. 200,000 per hospitalization for 95 employees). Health outcomes were evaluated using Years of Life Lost (YLL), with CVD-related proportional mortality at 18% and a YLL rate of 17.2% per 100,000 population. The analysis considered a comparator scenario of no screening, where hypertension prevalence would rise to 32%, leading to increased CVD-related complications. **Results** For a workforce of 10,000 employees aged 30–60 years, the annual screening cost was Rs. 32.4 million, inclusive of screening, diagnosis, follow-up, and treatment costs. The no-screening scenario, with an assumed prevalence of 32%, resulted in Rs. 67 million in costs due to untreated hypertension, including hospitalizations and productivity losses. The cost difference of screening compared to treatment and loss of work was Rs. 34.6 million.The incremental cost-effectiveness ratio (ICER) was -Rs. 66,117 per YLL averted. Compared to Sri Lanka's cost-effectiveness threshold of Rs. 3,749,550 per YLL averted (three times GDP per capita), the program is highly cost-effective. **Conclusion** The negative ICER indicates that screening not only improves health outcomes but also generates cost savings by reducing hypertension-related hospitalizations and productivity losses. Additionally, early diagnosis and treatment facilitated by screening improves productivity and would reduce morbidity and mortality among

employees. Timely, cost-effective interventions and periodic screening are important to prevent the upsurge of hypertension among employees. These results strongly support the integration of workplace screening into Sri Lanka's national non-communicable disease (NCD) prevention and control strategies. More evidence on the value of expanded capacity to include other screening in combination may inform new f models to support such investments leading to a more efficient and sustainable publicly funded healthcare system.

Ind-1119 Long-term Cost-effectiveness of Health Behaviour Intervention to Manage Type 2 Diabetes in Nepal: A Markov Modelling

PRESENTER: **Padam Kanta Dahal**, CQUniversity Sydney Campus
AUTHORS: Biraj Karmacharya, Melanie Lloyd, Lal Rawal, Rashidul Alam Alam Mahumud, Zanfina Ademi, Yeji Baek, Corneel Vandelanotte, Grish Paudel, Tomohiko Sugishita

Background: Long-term cost-effectiveness analyses of health behaviour interventions to effectively manage type 2 diabetes mellitus (T2DM) in low-income countries are crucial for minimising economic burden and optimising resource allocation. Therefore, this study aimed to estimate the long-term cost-effectiveness of implementing a health behaviour intervention to manage T2DM in Nepal. **Methods:** A Markov model in combination with a decision tree was developed to compare the costs and outcomes of the health behaviour intervention against usual care among 481 (238-intervention and 243-control) participants from healthcare and societal perspectives. The model integrates empirical trial data, with published data to inform parameters not collected during the trial. The model estimated costs, quality-adjusted life years (QALYs) and cost-effectiveness over 5 years, 10 years, 20 years, 30 years and a lifetime horizon with 3% annual discounting. Sub-group, scenario, both one-way and two-way analyses and probabilistic sensitivity analyses (PSA) were performed to assess the impact of uncertainty in the model under the threshold of 3 times gross domestic product (GDP) per capita (i.e., US $4140) for Nepal. **Results:** Base-case analysis with lifetime horizon showed that the health behaviour intervention compared to usual care improved QALYs by 3.88 and increased costs by US $4293 per patient, with an incremental cost-effectiveness ratio (ICER) of US $1106 per QALY gained from a healthcare perspective. From a societal perspective, QALYs also improved by 3.88 and costs increased by US $4550, with an ICERs of US $1173 per QALY gained. In the PSA, the probability of the health behaviour intervention being cost-effective was over 95%. **Conclusions:** The health behaviour intervention for managing T2DM was cost-effective over a lifetime horizon compared to usual care. To maximise its impact, this intervention should be scaled up nationwide, and future research is warranted to assess the long-term cost-effectiveness across diverse settings in low-income countries. **Keywords:** Type 2 diabetes, long-term cost-effectiveness, Markov modelling, health behaviour intervention

Ind-1600 Revisiting Cost-Effectiveness of Folic Acid Supplementation in Primary Stroke Prevention in China: Considering Vitamin B12 Deficiency Masking Issue

PRESENTER: **Xiyin Chen**
AUTHOR: David Bishai

Backgrounds Vitamin B12 (B12) or folate deficiency can lead to macrocytic anemia. However, treating B12 deficiency with folate alone can resolve anemia while allowing nerve degeneration to progress—a phenomenon known as the "masking" effect of folic acid. This masking delays the diagnosis of B12 deficiency, preventing timely treatment and increasing the risk of irreversible nerve damage. Although studies in China have shown that folic acid supplementation cost-effectively reduces stroke risk in hypertensive adults, the cost-effectiveness of folate supplementation in primary stroke prevention after adjusting for the potential risk of B12 deficiency masking has not been addressed. **Objectives** To evaluate the cost-effectiveness of four policy options for folic acid supplementation in primary stroke prevention for hypertensive patients in China, accounting for the masking effect of vitamin B12 deficiency. Policy A: No action to address folate status. Policy B: Folate supplementation without pre-screening for B12 deficiency. Policy C: Folate supplementation with pre-screening for B12 deficiency and adding B12 supplements for deficient patients. Policy D: Folate supplementation only for folate-deficient patients, with pre-screening for both B12 and folate deficiencies and adding B12 supplements for B12-deficient patients. **Methods** A decision tree with a five-year period of intervention based on the China Stroke Primary Prevention Trial (CSPPT) from the Chinese healthcare system perspective estimated incremental cost-effectiveness ratio (ICER) for Policy B, Policy C, and Policy D versus Policy A. Deterministic and probabilistic sensitivity analyses were performed for Policies C and D versus Policy A. Subgroup analyses for Policy C versus Policy A were conducted across gender, age, genotypes, and homocysteine levels. **Results** At a willingness-to-pay (WTP) threshold of three times the national GDP per capita ($38,198), Policy B was not cost-effective compared to Policy A, with an ICER of $47,968 per QALY, driven by QALYs lost due to delayed B12 deficiency diagnosis, and underestimated neuropathy treatment costs. In contrast, Policy C and Policy D were cost-effective compared to Policy A, with ICERs of $32,615 and $20,287 per QALY, respectively. Deterministic sensitivity analysis showed that Policy C and Policy D would cease to be cost-effective if the hazard ratio (HR) for the first stroke exceeded 0.83 and 0.85, respectively. Probabilistic sensitivity analysis showed a 72.7% and 83.5% likelihood that the additional costs of Policy C and Policy D, respectively, would remain within the WTP threshold. Subgroup analyses indicated that Policy C was more cost-effective for males, individuals aged 55–64, those with the MTHFR CC genotype, and homocysteine levels above 10.5 μmol/L. **Conclusions** Folate supplementation with integrated screening for B12 and folate deficiencies is considered the most cost-effective strategy for primary stroke prevention in hypertensive elderly patients in China. Future research should focus on advancing precision medicine to assess the feasibility and cost-effectiveness of nationwide implementation across diverse sub-populations within the context of integrated screening, ensuring efficient and tailored public nutrition strategy delivery.

Ind-2065 Cost-Effectiveness of Hypertension Management to Reduce the Burden of Dementia

PRESENTER: **Marie Lan**
AUTHORS: Ava John-Baptiste, Shehzad Ali

Background: The number of people living with dementia, and subsequent economic burden, is expected to increase drastically worldwide over the next 20 years. Due to lack of accessible and effective treatment options, primary prevention of dementia is a high priority for policymakers. Approximately 40% of dementia cases worldwide are attributable to 12 modifiable risk factors including hypertension. The World Health Organization guideline for dementia risk reduction recommended the management of hypertension to reduce the risk of cognitive decline and dementia. A recent systematic review found only 4 full economic evaluations assessing the impact of modifying hypertension to

prevent dementia, with no Canadian studies identified. Over 20% of Canadians with hypertension are undiagnosed, and of those, almost 40% have uncontrolled hypertension, making it a feasible target for dementia prevention in Canada. Economic analyses are essential to identifying cost-effective mechanisms to reduce the future burden of dementia. **Objective:** The objective was to evaluate the cost-effectiveness of improving hypertension detection and management to reduce the burden of dementia in Canada. **Methods:** We created a Markov model consisting of 8 states: a starting hypertension state, 3 dynamic hypertension states (Undiagnosed, Diagnosed and Uncontrolled, and Diagnosed and Controlled), three dementia states (Mild, Moderate, Severe), and death. We modelled a cohort of 1000 Canadians beginning at age 45 for a lifetime time horizon, from health payer and societal perspectives. We evaluated the impact of several hypothetical screening scenarios: one-time and annual hypertension screening programs, with varying levels of expected improvement in detection and management. **Results:** Hypertension modification led to an increase in life expectancy (+0.03 to +1.85 years), and delay in the average age of dementia onset (+0.03 to +1.29 years) for all scenarios. Incremental cost effectiveness ratios ranged between $16,190/QALY to $49,613/QALY. Interventions that improved blood pressure control rates, in addition to improved awareness, were consistently more cost-effective than scenarios that improved awareness only, regardless of intervention effectiveness. **Conclusions:** Dementia prevention through improved management of hypertension has the potential to be cost-effective in Canada. This is of particular interest to policymakers seeking to invest in dementia prevention. The study contributes to the small but growing economic evidence for targeting hypertension to prevent dementia. Future research should be directed towards creating and evaluating scalable hypertension interventions that improve both screening and control rates in Canada. The model can also be adjusted to apply to other jurisdictions.

Ind-2842 The Economic and Healthcare Resource Impact of Early Insulin Initiation in Type 2 Diabetes Mellitus Patients

PRESENTER: **Dhia Ticha**
AUTHORS: Gemala Chairunnisa P, Royasia Viki Ramadani, Budi Hidayat, Zahrina Laborahima

Introduction: A significant number of individuals with Type 2 Diabetes Mellitus (T2DM) remain undiagnosed. Indonesia ranks among the countries with the highest prevalence of diabetes, with an estimated 19.5 million cases reported in 2021. The burden of non-communicable diseases (NCDs), including T2DM, is also evident in the Indonesia healthcare expenditure patterns, where a substantial portion of public funds —amounting to 3.16 billion USD—is allocated to NCD management. NCD-related costs are the largest contributors to National Health Insurance (JKN) spending, with T2DM and its comorbidities alone accounting for 10% of total JKN expenditure. Additionally, NCDs consistently rank among the top 10 secondary diagnoses in outpatient and inpatient settings based on the number of visits and claim expenditures. This study is part of a broader initiative to assess the budget impact of insulin initiation at primary care in Indonesia, specifically focusing on its effects on cost outcomes and healthcare resource utilization of early insulin initiation among T2DM patients.** **Methods:** A systematic review was conducted using databases such as Medline (PubMed), EMBASE, Scopus, and Google Scholar. Articles published between 2007 and 2022 were screened using PICO criteria and inclusion/exclusion standards to identify relevant studies. **Results:** Out of 5,087 studies identified, 62 met the inclusion criteria. Basal insulin was the most examined intervention, appearing in 52% of cases. While insulin initiation generally increased costs within the first 6–12 months, long-term analyses demonstrated cost savings. Studies comparing early versus delayed insulin initiation revealed reductions in overall costs, including decreases in outpatient visits, pharmacy expenses for oral antidiabetic drugs (OADs), specialist consultations (from 25 to 16 per patient), and hospitalization rates. When comparing insulin adherence patterns (continuers versus interrupters or discontinuers), outpatient and pharmacy costs were higher for those discontinuing insulin. However, diabetes-related medical care, emergency department visits, and total medical expenses were significantly lower for adherent patients. Hospitalization rates and inpatient costs were also reduced among continuers. These findings highlight the importance of follow-up and consistent insulin management to maximize cost-effectiveness. Primary healthcare centers (PHCs), being community-based facilities, hold significant potential to support sustained insulin adherence. **Conclusion:** While initial insulin initiation may temporarily increase costs, total long-term expenses decrease. This review specifically examines early versus late insulin initiation, revealing that although pharmaceutical and medical device costs may rise, overall diabetes-related expenses are reduced. Early insulin therapy also decreases healthcare visits, although outcomes can vary depending on factors like complications and analysis duration. **Keywords**: Type 2 Diabetes Mellitus, insulin initiation, systematic review.

Ind-1804 The Effectiveness of a Co-Management Intervention for Chronic Conditions: A Pilot Study in Qingdao, China

PRESENTER: **Qian Fu**
AUTHORS: Da Feng, Zhanchun Feng, Jiaxin Lv, Xiao Li, Zhe Jin, Yangfan Sun

Importance The management of patients with multiple chronic conditions presents significant challenges to healthcare systems. **Objective** This study aimed to assess the effectiveness of a co-management model in enhancing health outcomes for patients with diabetes, hypertension, and hyperlipidemia. **Design, Setting, and Participants** This quasi-experimental study used data from "Co-management of Three Highs and Prevention of the Six Diseases" database in Qingdao, China from January 2019 to June 2023. **Interventions** A quasi-experimental design was chosen because it was not feasible or ethical to randomly assign participants to the intervention and control groups. Existing patient groups were used, with the intervention group consisting of patients with three chronic conditions in Chengyang District, and the control group consisting of patients from Licang and Shibei Districts. **Main Outcomes and Measures** The primary outcomes were diastolic blood pressure, systolic blood pressure, fasting blood glucose levels, and lipid profiles by the multilevel logistic regression models. Secondary outcomes were follow-up visits Health service utilization and healthcare costs by a two-period difference-in-differences model multilevel logistic regression, zero-inflated Poisson regression generalized linear mixed model. **Results**: A total of 89,000 patients were enrolled in the intervention group across the three chronic conditions. The analysis revealed a significant reduction in diastolic blood pressure in the intervention group, with an average decrease of 2.989 mmHg compared to the control group which was observed notably among elderly patients and those with comorbidities. The average fasting blood glucose level decreased by 0.134 mmol/L, with significant improvements observed in elderly and diabetic patients. Health service utilization decreased significantly, with outpatient visits reduced by 97.57%, inpatient visits by 25.38%, and total medical costs by 19.60%. **Conclusions and relevance** The co-management model demonstrated significant improvements in diastolic blood pressure and fasting glucose levels, alongside increased follow-up visits. The intervention also resulted in substantial reduction in health service utilization and overall medical costs. These findings suggest that integrated co-management strategies

can effectively improve patient outcomes and reduce healthcare burden in populations with multiple chronic conditions.

Ind-2470 Modelling the Potential Impact of Tobacco Tax in Kenya: Implications for Primary Prevention of Non-Communicable Diseases and Health Financing

PRESENTER: **Robinson Oyando**

Background: In Kenya, two out of ten people smoke tobacco. Tobacco taxation reduces smoking-related premature deaths and increases government revenues but has been criticised for disproportionately affecting poorer people. We assess the distributional consequences (across different wealth quintiles) of a specific excise tax on cigarettes in Kenya in terms of both financial and health outcomes. **Methods:** We use extended cost-effectiveness analysis methods to estimate, across income quintiles, the health benefits (years of life gained), the additional tax revenues raised, the net financial consequences for households, and the financial risk protection provided to households, that would be caused by a 40% increase in tobacco price through excise tax fully passed onto tobacco consumers. For our modelling analysis, we used plausible values for key parameters drawn from data on price elasticities, healthcare cost, income, tobacco consumption that were sourced from the literature and representative national surveys*.* **Results:** Our modelling analysis showed that a 40% increase in tobacco price through excise tax would lead to 115 million years of life gained (95% uncertainty range 94–168 million) over 20 years (a third of which would be gained in the lowest income quintile), a gain of US$352 billion ($308–391 billion) of additional tax revenues from the excise tax (14% of which would come from the lowest income quintile, compared with 24% from the highest income quintile). The excise tax would increase overall household expenditures on tobacco by $188 billion ($116–253 billion) but decrease these expenditures by $11 billion (–$41 to $2.5 billion) in the lowest income quintile and would reduce expenditures on tobacco-related disease by $12·0 billion ($8·7–13·1 billion, 28% of which would benefit the lowest income quintile). Finally, it would provide financial risk protection worth $0·9 billion ($0·6–1·2 billion), mainly concentrated (74%) in the lowest income quintile **Conclusion:** Increased tobacco taxation can be a pro-poor policy instrument that brings substantial health and financial benefits to households in Kenya.

abs-os433 Economic Evaluation of the Ghana Heart Initiative: A Health System Strengthening Intervention for Cardiovascular Disease Management

PRESENTER: **Kavita Singh**, Heidelberg University

AUTHORS: Eugene Kallson, Ms. Manuela De Allegri, Elom Otchi, Alfred Yawson

Background: Cardiovascular diseases (CVDs) pose serious threats to economic development and healthcare systems due to the rapidly rising burden in low- and middle-income countries (LMICs). Health system interventions addressing existing CVD coverage gaps are on the rise in these contexts but effective knowledge translation is lacking. Further, limited economic evidence exists on health system interventions to manage CVD in Sub-Saharan Africa, a region with one of the highest age-standardized CVD burdens. We address this knowledge gap by estimating the economic costs and budget impact of implementing the Ghana Heart Initiative (GHI), a health system intervention piloted in the Greater Accra region since 2019 and later scaled up nationally. The GHI consisted of development and dissemination of evidence-based guidelines for CVD, health worker training, essential equipment supply, 24x7 CVD call center support, and data management support. **Methods**: The GHI economic evaluation adopted a health system perspective, considering program-level costs incurred by the GIZ, the Ghana Health Services (GHS) and Ministry of Health (MoH) using an established activity-based costing approach. We tracked all resources utilized, identifying seven activity clusters for cost categorization, during the pilot phase of GHI from 2018 to 2022, with design (12 months) and implementation phases (36 months). We constructed three scenarios around service delivery, design or expansion elements to forecast the budget impact of nationwide scale-up. **Results:** Economic evaluation revealed total costs of 1,740,853 Euros, with design costs comprising 8.5% (€148,558) and implementation costs of 91.5% (€1,592,295). Human resources constituted the highest expense, followed by consumables, transportation, and room rental. The total financial cost per intervention facility per year was €10,337.0 and the economic cost per facility was €10,615.0. The annual cost per health worker targeted was €861.0. and annual cost per person screened/managed was €34.5. Scaling GHI to 100% coverage would require 2.4% of Ghana's total health budget (€26.7 million, or per capita cost €0.81), whereas focusing on essential service delivery components could reduce the costs to €10.7 million or per capita cost €0.32 (~1% of the national health budget), assuming coordination and monitoring costs are covered by parallel NCD programs. **Discussion/Conclusion**: The low cost of scale-up of GHI suggests that this intervention presents a viable strategy to respond to the growing CVD epidemic in low- and middle- income countries, and should qualify as a priority intervention across other Sub-Saharan African countries with similar demographics and health systems.

abs-os447 Cost-Effectiveness Analyses of Cascade Screening for Familial Hypercholesterolemia: a Comparative Analysis Between Singapore and Thailand

PRESENTER: **Jing Lou**

AUTHOR: Hwee Lin Wee

Background: Familial Hypercholesterolemia (FH) is an autosomal dominant disease with strong genetic linkage. With FH, elevated levels of LDL-C begin at childhood, causing cardiovascular disease (CVD) at a relatively young age. Cascade screening on FH has been found cost-effective in many countries. However, cost-effectiveness analyses (CEA) on cascade screening for FH has not been done in Asia. And existing studies have not analysed how country-specific characteristics affect cost-effectiveness of the screening. It will be interesting to see if differences in localised model parameters such as cost, treatment options and uptake of genetic testing by family members between countries have any impact on the conclusions (i.e. incremental cost-effectiveness ratios (ICER)). Comparison between studies of different countries may not reveal the true impact of country-specific characteristics, due to confounding effects from methodological, structural and parameter uncertainties between studies.

Aim: This study aims to compare between Singapore and Thailand (i) cost-effectiveness of the cascade screening for FH with genetic testing and (ii) drivers for ICER, and to analyse what country-specific characteristics lead to the differences.

Methods: We compared population health characteristics, screening protocols, screening uptake rates and treatment protocols between the two countries. To control for structural uncertainty, country-specific characteristics were put into a same hybrid tree-Markov model structure. To alleviate methodological uncertainty, country-specific parameters were estimated based on the same clinical assumptions using data from the same source, whenever available. Drivers of cost-effectiveness were analysed using one-way sensitivity analysis. To reduce impact from unbalanced parameter uncertainty between the two countries, each variable deviates from its base-case value by 10%, except that probability parameters and health-related quality of life deviate from their base-case value by +/- 0.05 (=0.5x10%), as X is equivalent to 1-X. Costs where quantified from healthcare system perspective for Singapore while from societal perspective for Thailand, as required by local guidelines respectively.

Preliminary results: Although the two countries tied in FH prevalence, Thailand has higher CVD incidence rate and higher relative mortality risk with CVD. Genetic tests are used more intensively during the screening in Thailand, while FH patients are treated more intensively in Singapore. Proband screening uptake rate is higher in Thailand, while family member participation rate is higher in Singapore. As a result, the screening is more cost-effective in TH than SG in terms of absolute ICER value. However, ICER is well below the cost-effectiveness threshold (CET) in SG, while closer to the CET in TH. From the probabilistic model, the probability for the screening to be cost-effective is ~80% in SG, while ~60% in TH. The close proximity of ICER to CET in TH is mainly due to the high treatment cost in FH compared to that for non-FH. Common drivers for ICER between the two countries include cost and effectiveness of lipid-lowering treatment for FH, prevalence of FH mutation among probands, age of proband and family members, health loss and medical cost associated with CVD, CVD risk associated with FH and number of family members and their participation rate. Cost of genetic testing is a driver for Thailand only, due to high cost and intensive use of genetic testing in Thailand.

Conclusion: Cascade screening for FH is likely to be cost-effective in Singapore. In Thailand, cost-effectiveness of the screening could be significantly improved by reducing the treatment cost of managing FH.

10:30 AM –12:00 PM TUESDAY [Health Care Financing & Expenditures]

Bali International Convention Centre – Dahlia

Fiscal Space for Health

MODERATOR: **Piya Hanvoravongchai**,

Ind-803 Who Wants to Pay More Taxes for Better Long-Term Care Services? Evidence From OECD Countries

PRESENTER: **Sylvain Botteron**
AUTHORS: Christophe Courbage, Joël Wagner

Introduction: Increasing long-term care (LTC) needs and expenses pressure the financing of LTC which mainly relies on public funding in most countries (OECD, 2017). This calls for a better understanding of the resources allocated in financing LTC and individuals' willingness to pay (WTP) to fund these LTC services through taxation or social contributions.

However, research on the topic is relatively scarce and country-specific. It shows the important role of age, income, political factors and perception of LTC risk in driving the WTP for social insurance (see e.g. Brau and Lippi Bruni (2008) and Amilon et al. (2020)).

Our study expands the literature on stated preferences for LTC by using recent OECD surveys to investigate how various individual and country characteristics influence the WTP to increase taxation and social contribution to improve LTC services and access.

Methods: We use data from the 2020 and 2022 waves of the OECD's "Risks that Matter" surveys, which is a cross-national survey covering 25 OECD countries and examining people's perceptions of the social and economic risks they face. In particular, we use answers to the following question to carry out our analysis: "Would you be willing to pay an additional 2% of your income in taxes/social contributions to benefit from better provision of and access to LTC services for elderly people (including e.g. home, community-based, institutional care)?".

We first employ generalized linear mixed-effects models configured as logistic regression models. These models include country-fixed and random effects, allowing us to estimate the impact of country-level variables alongside individual-level effects. Finally, we also conduct standard logit regressions for individual countries to analyze local nuances further.

Results: The analysis shows that individuals with higher education, income, older age, female gender, LTC responsibilities, or left-wing political views are more willing to support increased taxation or contributions for better LTC access. At the country level, higher LTC spending as a proportion of GDP decreases WTP for increased taxation and social contributions. In contrast, greater government trust and cash benefits policy for carers increase it.

Conclusion: This study highlights a generational, social, and political divide in attitudes toward public LTC funding across OECD countries. It shows that increasing taxes and social contributions to improve LTC services is supported by specific population categories. Such results can be useful to policymakers when organizing and prioritizing LTC services.

Ind-421 Tax on Oil Production and Health Financing in Brazil

PRESENTER: **Fernando Antonio Slaibe Postali**
AUTHORS: Adriano Dutra Teixeira, Maria Dolores Montoya Diaz, Natália Nunes Ferreira Batista, Rodrigo Moreno-Serra, Luciano Mancuso Salomão, Judite Gonçalves

Context: Brazil has one of the largest public health systems in the world (SUS), covering approximately 160 million people nationwide. The SUS governance structure is based on shared responsibility among the federal government, states, and municipalities to provide healthcare for the entire population. A significant subset of Brazilian municipalities is also entitled to a share of oil tax revenues (oil royalties), proportional to the volume of oil production within their territories. To address ongoing challenges in achieving Universal Health Coverage (UHC) and securing sustainable financing, Brazil enacted legislation in 2013 (Act 12,858/2013), mandating that 25% of oil royalty revenues allocated to municipalities be invested in healthcare. This law, applicable only to oil wells that began operations after December 2012, introduced a new stream of earmarked funds to municipal budgets, specifically aimed at strengthening local health systems. The phased implementation of this policy offers a unique opportunity to assess its impact on municipal health spending and outcomes. **Objectives**: This study aims to evaluate the impact of this legislation on healthcare expenditures and outcomes of municipalities benefiting from receiving oil royalties. It focuses on primary healthcare spending and outputs since they are the main responsibility of municipalities according to the Brazilian Federative Pact. By examining how oil royalties influence specific areas of health spending, this study sheds light on the policy's effectiveness in expanding fiscal space for health in Brazilian municipalities. **Methods**: We employ a difference-in-differences (diff-in-diff) approach with multiple treatment periods, following the methodology proposed by Callaway and Sant'Anna (2021)[^1]. This approach leverages the gradual adoption of the policy, allowing us to measure its impact over time and account for variations across municipalities with differing fiscal capacities and sizes. Data were sourced from the Brazilian National Health System Database (SIASUS/Datasus) and the National Treasury (Finbra), covering the period from 2008 to 2022. Heterogeneity analyses further explore the effects among municipalities with above-average royalty revenues. **Results**: Findings indicate that the law's overall impact on increasing health and education spending was limited. However, in municipalities receiving higher-than-average royalty revenues, prolonged exposure to the policy was associated with increased healthcare spending, particularly in hospital care. Improvements in health promotion procedures were also observed in highly benefiting municipalities, suggesting targeted improvements in healthcare expenditures where royalty allocations were more substantial. On the other hand, no significant impact was found in public hospital beds and primary health care teams (Family Health Strategy). **Discussion**: The results highlight the complexities of using earmarked revenues to influence health outcomes, as the policy showed limited success in universally improving health indicators across municipalities. Nonetheless, the observed increase in healthcare spending among wealthier municipalities underscores the potential of oil royalties to expand fiscal space for health, albeit unevenly. These findings have implications for policymakers in refining oil revenue allocation rules to better support health financing, particularly in resource-rich but economically diverse regions. [^1]: Callaway, B. and Sant'Anna, P. H. (2021). Difference-in-differences with multiple time periods. Journal of Econometrics, 225(2):200–230.

Ind-2153 Convergence in Healthcare Expenditure among Indian States: Does Fiscal Space Matter?

PRESENTER: **Jalandhar Pradhan**
AUTHOR: Ajit Nag

Background: The top priority in the United Nations' Sustainable Development Goals-2030, is to achieve Universal Health Coverage (UHC), which ensures equal access, quality, and financial security for healthcare services to all in need. Government financing for healthcare is less prevalent in low- and middle-income countries (LMICs) than private sources of financing, which may cause problems in achieving UHC. Despite encouraging economic growth, many LMICs, including India, still require sufficient public funding to meet the UHC. Healthcare is crucial for creating human capital, preserving global well-being, and contributing to development. The most significant obstacles to establishing UHC in India are the unequal distribution of fiscal resources and the lower prioritization of budgets for healthcare across Indian states. **Aim:** The key questions addressed in this study are: i) Is there any convergence in health expenditures across Indian states?; ii) Does club convergence occur in healthcare expenditures among the Indian states?; iii) How does fiscal space impact each club's and overall government healthcare expenditure?; iv) Would domestic revenue mobilization through tax and non-tax revenue enhance healthcare financing? **Methods:** In this paper, data from the state finance budget report of the Reserve Bank of India has been used to analyze the relationship between government health expenditure with other variables such as Tax Revenue, Non-Tax Revenue, Fiscal Transfer, Borrowings and per capita net states domestic product for a panel of 22 Indian states from 1990-91 to 2020-21. The variables have been adjusted for inflation and population size. The study employs the club convergence approach proposed by Phillips and Sul (2007) to investigate whether states converge toward a single steady-state equilibrium or multiple groups. **Results:** The results reveal that Indian states haven't achieved a single steady-state equilibrium. Instead of overall convergence, the findings show two final club convergence and two divergence states (Arunachal Pradesh and Bihar) for health expenditure. Our panel regression analysis indicates that tax revenue, non-tax revenue, fiscal transfers, and per capita income positively influence per capita government health expenditure. However, borrowings negatively impact the long-term allocation of government expenditure on healthcare within each convergence club. The analysis suggests that heavy reliance on borrowed funds may lower the priority of health spending. The result emphasizes increasing revenue through tax base expansion, earmarked taxes, and sin taxes to boost fiscal space across Indian states. **Conclusions:** These findings highlight the need for policymakers to revise health spending strategies to enhance coordination and support growth and state integration. Additionally, the government should efficiently allocate central transfers and establish an expenditure management framework to prioritize healthcare, ensuring balanced healthcare spending among states. **Keywords:** Club Convergence, Fiscal Space, Tax Revenue, Non-Tax Revenue, Fiscal Transfer, Borrowings, Per capita income

Ind-380 Worldwide Resource Need for Normative Health Service Packages: Ingredient-Based Microcosting Using the UHC Compendium

PRESENTER: **Charlie Nederpelt**
AUTHORS: Rob Baltussen, Hassan Haghparast-Bidgoli, Gerard Joseph Abou Jaoude, Gavin Surgey

Introduction The World Health Organization (WHO) and Disease Control Priorities (DCP) network created health service packages (HSPs) to support countries in achieving universal health coverage (UHC). The WHO Universal Health Coverage Compendium (UHCC) is a novel database containing input-defined definitions for a comprehensive list of essential health services. To mobilize and allocate resources, policymakers require understandable, accurate estimates of financial, workforce and material needs. We present the first methodology and proof-of-concept results for a health system-wide, ingredient-based costing producing these outputs efficiently, using the UHCC. **Methods** Facility-level service delivery costs were estimated for four HSPs: Core UHCC, complete UHCC, DCP-3 Highest Priority Package (HPP) and DCP-3 Essential Universal Health Coverage (EUHC). We constructed a linear, ingredient-based microcosting model, multiplying frequency of each UHCC input type [labor, drugs, in vitro diagnostics, consumables] with unit cost estimates sourced from scientific literature and tools like WHO-CHOICE and pharmaceutical cost databases. Costs were converted to 2016 USD to align with previous DCP-3 costing estimates. National delivery costs were modeled by multiplying country-specific unit costs with Populations-in-Need estimates sourced per intervention from scientific publications, United Nations Population Division, WHO and Global Burden of Disease data. National delivery costs were differentiated across normative delivery platforms, and corrected for noncommunicable disease multimorbidity. To validate externally, average delivery costs were compared to 2016 DCP Cost Model results. Unit cost for selected noncommunicable disease interventions were compared to international professional bodies' cost estimates. The proportional contribution of different input categories in total cost was compared to published literature across different countries. **Results** Unit cost and national program cost were estimated for 132 low, lower-middle and upper-middle income countries. Delivery cost of DCP-3 HPP was 2016$427 billion, varying between 4.2-11.4% of national GDP. Cost estimates for Core UHCC and Complete UHCC were significantly higher at $663 billion and $1.431 billion, corresponding to 6.6-27.8% of GDP in studied countries. Unit costs for DCP-3 HPP and EUHC HSPs deviated from previous estimates by -33 to +42% for HPP, and -5 to +74% for EUHC interventions. Presented unit costs for EUHC and HPP services were within 20% margin of previous estimates for 106/215 (49%) of services. Presented unit cost estimates matched those published by international professional bodies well for e.g. diagnosis and treatment of diabetes mellitus (+7%), ischemic heart disease (+13%), and ischemic stroke (+5%). Primary cost-drivers were labor [22%], medicine [14%] and overhead [38%], which is broadly reflective of published results from several lower and lower middle-income countries. **Conclusion** This study presents initial ingredient-based cost estimation of authoritative HSPs. Large discrepancies compared to previous cost estimates highlight the necessity of data contextualization and warrant further exploration. Results require cautious interpretation and, at worst, represent potential underestimation of normative UHC resource needs. Methods and estimates presented are intended as a starting point for improvement with localized data, and are accompanied by clear workflows for such contextualization.

Bali International Convention Centre – Executive Room 2

Financial Protection for UHC

MODERATOR: **Gil Shapira**, The World Bank

Ind-1563 Modeling Potential Distributional Health and Financial Risk Protection Impacts of National Health Insurance in Uganda

PRESENTER: **Dorit Talia Stein**

AUTHORS: Stéphane Verguet, Freddie Ssengooba, Aliyi Walimbwa, Goodarz Danaei

Background: There is no National Health Insurance Scheme (NHIS) in Uganda, with only 1% of the population having health insurance. There is also a rising burden of cardiovascular diseases (CVDs), with poor health system performance for managing risk factors such as hypertension. In this analysis, we simulated the potential impact of NHIS that generates demand for hypertension care on health and financial risk protection (FRP) outcomes.

Methods: We developed a microsimulation model using nationally representative surveys, administrative data, and stakeholder input. We evaluated the impact of insurance enrollment—with and without improving supply-side capacity—on hypertension treatment coverage, CVD cases and deaths, and catastrophic health expenditures (CHE) over ten years among adults with hypertension. In business-as-usual, individuals progressed through outpatient care-seeking, diagnosis, and hypertension treatment cascade steps, with anti-hypertensive (HTN) treatment initiation reducing CVD risk. CHE occurred when out-of-pocket (OOP) inpatient medical costs exceeded thresholds of household consumption. We modeled two insurance scenarios: universal enrollment and staggered enrollment over time for the informal and unemployed sectors. Care-seeking and HTN treatment probabilities changed with insurance enrollment. Diagnosis and treatment probabilities additionally improved with supply-side improvement. We summarized care cascade outcomes, CVD cases, and CHE cases averted (vs. business-as-usual), overall and by employment status.

Results: Universal insurance enrollment improved HTN treatment coverage at ten years to 55% (from 41%), or to 81% with supply-side improvements. Staggered enrollment increased HTN treatment coverage to 50% without, or 75% with, supply side improvements. Overall, universal enrollment into insurance would avert 240 (95% uncertainty interval [UI]: 103, 403) CVD cases per 100,000 people with hypertension vs. business-as-usual, increasing to 790 (640, 950) with supply-side improvements. Staggered enrollment would avert 110 (-150, 360) CVD cases per 100,000 people with hypertension over ten years, increasing to 600 (360, 850) with supply-side improvements. In total, universal enrollment averted 6,590 CVD cases (increasing to 21,600 with supply-side improvements) compared to 3,000 with staggered enrollment (and 16,540 with supply-side improvements). Among the informally employed, 4,580 CVD cases were averted with universal enrollment and 1,830 with staggered enrollment, with similar reductions among the unemployed sector. In terms of FRP, universal enrollment would avert 70 (-40, 180) CHE (25% threshold) cases per 100,000 people with hypertension vs. business-as-usual, reducing to 30 (-110, 150) with staggered enrollment. In total, 1,810 CHE cases would be averted with universal enrollment (increasing to 5,980 with supply-side

improvements) compared to 780 with staggered enrollment (4,350 with supply-side improvements). CHE cases averted among the informally employed would reduce from 1,160 cases averted with universal enrollment to 450 cases averted with staggered enrollment.

Conclusion: The potential health and FRP impacts of NHIS in Uganda would be dampened by staggered insurance enrollment and constrained by supply-side capacity to diagnose and treat hypertension. Foregone benefits would be greatest among the informally employed and unemployed. Uganda should pursue universal insurance enrollment, with focused efforts to enroll the informal sector and unemployed population, and invest in improving quality-of-care and service delivery infrastructure to maximize the potential benefits of a national health insurance program.

Ind-1983 Equity in Insurance Contributions Under Non-Employment-Based Health Insurance Plans in the Japanese Mandatory Health Insurance System

PRESENTER: **Ayako Honda**, Hitotsubashi University
AUTHORS: Ruru Ping, Takashi Oshio

Title: Equity in Insurance Contributions in the Japanese Mandatory Health Insurance System

Background

In 1961, Japan achieved full health insurance coverage using a combination of employment-based and non-employment-based insurance plans. The Japanese mandatory health insurance system offers a range of plans that can be broadly categorized as employment-based and non-employment-based plans. Non-employment-based plans are further subdivided as plans for people aged 75 and over and plans for people not covered by other plans (residence-based plans). The multiple plan structure has more than 1500 insurers covering different population groups, and each insurer determines their own member contribution rates. As recent economic and demographic changes are challenging the Japanese health system, the Government is undertaking reforms that aim to improve efficiency and equity in the system. However, limited studies have addressed equity in the member contributions paid for health insurance plans in the Japanese system, impacting on the ability to formulate appropriate reforms.

Aim and Objectives

This study explores vertical equity in the member contributions paid in the Japanese mandatory health insurance system, that is, alignment between member contributions and people's ability to pay. This study aims to assess vertical equity in: (1) general insurance contributions in the Japanese mandatory health insurance system, and (2) member contributions paid in different insurance plan types.

Methods

The study uses cross-sectional data from a national survey (Comprehensive Survey of Living Conditions, 2010-2022) and estimates the Kakwani index, which is the difference between the concentration index of insurance contributions and the Gini coefficient for household ability to pay (ATP). ATP is measured using market income, pre-tax income, and after-tax income. Household income is adjusted using an equivalence scale.

Key findings and discussion

Based on after-tax income, overall insurance contributions under Japan's mandatory health insurance system are progressive, even though payment rates are not adjusted for ATP. Insurance contributions in plans for those aged 75 and over and residence-based plans are regressive when using market income but are progressive when using pre-tax income and after-tax income. Social security benefits appear to mitigate disadvantage by redistributing income to improve ATP. In addition, government subsidies assist low-income groups to make insurance contributions. Insurance contributions made in employment-based plans are slightly regressive, indicating the need to review contribution rates, with consideration given to ATP and removing upper limits on contribution rates. As insurers in Japan's mandatory health insurance can determine member contribution arrangements, and contribution rates vary between insurance types and insurers, further study on the horizontal equity of insurance contributions is necessary to determine whether households with the same ability to pay make the same contributions.

Ind-2383 The Long Road to Equality for People with Disabilities: Evaluating the Adequacy of National Health Insurance s Benefit Packages

PRESENTER: **Dwi Oktiana**
AUTHOR: Muhammad Vinka Lutfian

Introduction

Access to health services remains a significant challenge for people with disabilities in Indonesia, despite more than 200 million (70%) of the people have registered into the national health insurance (JKN). The National Survey of 2023 found 48.8% of people with disabilities had health symptoms in the past month compared to 24.6% non-disabled individuals. Alarmingly, 28% of people with disabilities have not enrolled into the JKN, leaving 75% of them unable to seek medical treatment when they are suffering from ill-health. This disparity is further exacerbated by higher poverty rates among people with disabilities, driven by living expenses that are 30% higher than those of non-disabled individuals. Health care equality for people with disabilities remains elusive, with JKN covering only 7 out of the 50 assistive devices recommended by the World Health Organization (WHO). This study aims to evaluate the adequacy of the JKN benefit package for people with disabilities, explore potential improvements, and identify barriers to accessing health services.

Methods

Using a mixed-methods approach, the study integrates quantitative data from surveys of 120 people with disabilities, primary utilization data of the JKN, and secondary data of the national surveys of socio-economic and employement. Qualitative data were gathered through in-depth interviews with people with disabilities and their families, consultations with policymakers at the national and regional levels, and focus group discussions with disability organizations. Data collection was conducted in four selected districts/cities and at the national level. Quantitative data were analyzed to provide descriptive statistics, while qualitative data were examined using Jean-Frederic Levesque's (2013) Access to Health Services framework.

Results

The findings reveal significant inadequacies of the JKN benefit for people with disabilities as follow: (1) the reimbursement rates are far below the cost of standard assistive devices needed, (2) long replacement periods for assistive devices reduce the effectiveness of the co-payment—for example, locomotor prostheses can only be replaced every five years, with a reimbursement cap of USD 150. (3) no data on disability on the membership database complicates utilization reviews, and (4) the JKN only covers medical care but does not cover disabilities.

Conclusiion & Recommendation

Disable people have the following barriers to healthcare: (1) insufficient availability of specialized health professionals, (2) lack of eligibility to be covered by health insurance due to people registration issues, (3) lack of disable friendly of public transports, (4) inadequate infrastructure of health facilities for disable (e.g., steep ramps, broken guiding blocks, absence of Braille or sound systems), and (5) limited awareness and training among health and non-health workers about disability-specific needs.

We recommend (1) disability organizations to undertake Health Technology Assessment to demonstrate the economic benefits to add assistive devices, (2) Adopting standard universal design health facilities, and (3) Adding the JKN data on all disabilities to enhance policy planning and monitoring.

Ind-1712 Estimating Costs for Hereditary Diseases through Premarital Screening

PRESENTER: **Hasbullah Thabrany**, Thinkwell/USAID Health Financing Activity
AUTHORS: Dini Kurniawati, Iko Safika, Ratu Martiningsih, Wira Hartati, Nurul Rahmayanti, Mutia Astrini Pratiwi

Background:

Indonesia has a Maternal Mortality Rate of 189 per 100,000 live births and an Infant Mortality Rate of 17 per 1,000 live births. The prevalence of stunting remains high at 21.5% in 2023. A significant number of women continue to suffer from both communicable and non-communicable diseases. Specifically, 2% have diabetes mellitus, 10.5% have hypertension, 0.22% have tuberculosis, and 0.13% have hepatitis (Indonesia Health Survey [SKI], 2023). Among pregnant women, 28% experience anemia, and 16% are diagnosed with HIV (SIHA, 2023). Without proper screening, potential annual claims could amount to IDR 9.8 trillion (approximately US$ 625.6 million). To mitigate higher claim costs, the Ministry of Health prioritizes screening for 14 major diseases, focusing on at-risk populations. Premarital screening aims to prevent disease transmission between partners, support healthy pregnancies, avoid hereditary diseases, and contribute to a healthier future generation. Therefore, there is a need for a model that estimates the potential cost savings from JKN claims through premarital screening. This study evaluates the economic benefits of premarital screening and the potential cost savings resulting from disease reduction.

Methods:

The methods employed in this study include a literature review and secondary data analysis. The secondary data was sourced from Statistics Indonesia, covering 2018 to 2023, which we used to predict future marriage rates 2025-2030 through linear regression. We utilized SKI 2023 to evaluate disease prevalence and accessed the government's E-Catalog to procure goods and services to obtain standard pricing. We adjusted the figures based on the average annual inflation rate to estimate costs. Ultimately, we projected costs for three different screening package scenarios (basic, moderate, and comprehensive) and applied two assumptions regarding JKN membership in the screening benefit package including Anthropometric, Physical and Mental Test, Hemoglobin, HIV and Syphilis, Hepatitis B, Diabetes Mellitus, Tuberculosis, Hypertension, and Thalassemia

Results:

The estimated number of prospective brides and grooms nationally in 2025 is 3.5 million, which will decrease to 2.9 in 2030. Therefore, the screening costs the government should provide for 2025 are IDR 26.7 billion (US$1.7 million) and IDR 256.0 billion (US$ 16.3 million), screening costs 2025-2030 are IDR 161.9 (US$10.3 million) billion to IDR 1.8 trillion (US$115 million) depending on the selected scenario and assumption. Furthermore, the prevalence of both hereditary and communicable diseases among individuals aged 20-30 is 26%. Through screening, it can be monitored to prevent the progression of more advanced diseases. If 26% undergo treatment, the annual claim burden could be reduced by IDR 2.5 trillion (US$160 million). Further, we will do some economic impact based on modeling to calculate future savings from the screenings.

Conclusions:

The Indonesian government could set an example for developing countries by implementing premarital screening programs. This initiative could help prevent hereditary severe diseases and manage communicable diseases, ultimately reducing future healthcare costs. We recommend that the government monitor and evaluate the quality of life for individuals participating in these premarital screenings.

Bali International Convention Centre – Nusa Dua

Supporting Children and Families

MODERATOR: **Mary Wanjau**,

Ind-1735 Cost-Effectiveness Analysis of Screening Three-Year-Old Children for Social-Emotional Problems Combined with Parenting Program in Swedish Settings

PRESENTER: **Inna Feldman**
AUTHORS: Anni-Maria Pulkki-Brännström, Anneli Ivarsson, Filipa Sampaio, Emanuela Pires, Masoud Vaezghasemi

Background. Problem behavior in childhood and adolescence is a predictable consequence of problematic adjustment in early childhood. As such, poor social-emotional functioning is a risk factor that has been linked with mental health problems later in childhood, adolescence and adulthood. Therefore, early detection and addressing social emotional problems among small children are crucial.

Aim. The aim of this study was to assess the long-term cost-effectiveness of a population-based screening to detect social-emotional problems with ASQ:SE® in 3-year-old children combined with an evidence-based parenting intervention Incredible Years® (IY), provided to parents of children with high levels of social-emotional problems

Methods. A decision-analytic Markov model was developed, to compare two alternatives: 1) all 3-years-olds get screened for social-emotional problems, and parents for children at a high risk receive IY parenting program; 2) no screening and no intervention ("do nothing"). The prevalence data on social-emotional problems in 3-year-olds was provided by Västerbotten Region (Sweden). The cohort of 3-year-olds with social-emotional problems was modelled until they reached 19 years old. The model considered development of emotion problems (anxiety) and attention deficit hyperactivity (ADH) problems, over 16 years. Effectiveness of IY was sourced from published literature. The analyses were conducted from a limited societal perspective, including healthcare and educational costs. Health outcomes were assessed with DALYs averted and results were expressed as Incremental Cost-Effectiveness Ratios (ICER).

Results. Screening with ASQ:SE combined with the evidence-based parenting intervention IY demonstrated larger costs (incremental cost €148,639) and more DALYs averted (incremental DALYs 14.72) than no screening and no intervention, with an ICER of €10,100/DALY averted. The preventive approach evaluated in this study was cost-effective compared to a "do-nothing" alternative in the Swedish setting, at a local willingness to pay threshold of €53,122.

Conclusion. The findings align with previous research; prevention aimed at children's mental health problems will likely provide good value for money. Successful implementation of population-based screening for social-emotional problems combined with an effective evidence-based parenting intervention might be an important way to contribute to sustainable and efficient healthcare system in Sweden.

Ind-1047 Impact of Child Maltreatment on the Costs of Health Service Use and Productivity Loss: Findings From the Australian Child Maltreatment Study

PRESENTER: **Dai Quy Le**
AUTHORS: Marie Yap, David Lawrence, Daryl Higgins, Cathy Mihalopoulos, James Scott, Divna Haslam, Long Le, Ben Mathews, Eva Malacova

Background: A recent nationally representative survey in Australia found approximately 62% of adults experienced some form of child maltreatment (Mathews et al., 2023). Child maltreatment has been linked to more than 184,000 Disability-Adjusted Life-Years due to mental ill health (Grummitt et al., 2024) and increased healthcare service utilization in Australia (Pacella et al., 2023). However, the impact of child maltreatment on the costs of healthcare and productivity loss remains unknown in Australia. **Objectives:** This study aimed to examine the costs of health service use and productivity loss due to unemployment associated with child maltreatment in Australia. **Methods:** Cross-sectional data from the Australian Child Maltreatment Study (ACMS), which included 8503 participants (49.2% female, age M = 38.1, SD = 18.7), were analyzed in this study. The ACMS utilized the 16-item Juvenile Victimization Questionnaire-R2 to assess five types of child maltreatment, including physical abuse, sexual abuse, emotional abuse, neglect, and exposure to domestic violence. Health service use was self-reported using items adapted from the 2007 National Survey of Mental Health and Well-being (Australian Bureau of Statistics, 2008). Additional demographic, economic, and health-related information such as age, sex, employment status, residential postcode, current financial stress, height, and weight were also collected. A bottom-up costing approach using individual-level data to estimate the cost of health consultation, overnight hospitalization, and overall health service utilization. Costs of health consultation were calculated by multiplying the frequency of visits to each type of health professional by unit costs from the Medicare Benefits Schedule. Overnight hospitalization costs were derived using a formula and unit costs from the Independent Health and Aged Care Pricing Authority. Costs of productivity loss due to unemployment were estimated using the human capital approach. Two-part models, comprising logistic regression and generalized linear models, were used to estimate and compare health service use and costs between those with and without child maltreatment experiences. Sensitivity analyses were conducted by varying assumptions about out-of-pocket and hospitalization costs. **Results:** Annual healthcare cost for each individual with CM was A$1,670 higher than those without CM. Productivity losses due to unemployment averaged A$2,750 extra annually for those in the labor force with CM. These costs increased with the number of CM types experienced and remained highest among those with any neglect, followed by sexual and emotional abuse. A notable portion of health service use costs was likely attributed to mental health services. Subgroup analyses also revealed higher health service use costs for females and individuals with diverse gender identities.

Findings mostly remained robust across sensitivity analyses. Overall, CM was associated with annual health service use costs of A$21.6 billion and productivity loss of A$24.1 billion **Conclusion:** Child maltreatment imposes substantial healthcare and productivity costs on the Australian healthcare system and economy. This highlights the need for greater investment in child maltreatment preventive interventions in Australia.

Ind-1124 Economic Evaluation of a Parenting Intervention for Children Development Embedded in a Social Safety Net Programme in Urban Bangladesh

PRESENTER: **Sheikh Jamal Hossain**
AUTHORS: Jena Derakhshani Hamadani, Jane Fisher, Hassan Haghparast-Bidgoli, Anisur Rahman, Fahmida Tofail, Syed Moshfiqur Rahman

Introduction: Evidence from low- and middle-income countries has shown that parenting intervention alone or in combination with other interventions, can improve children's development. Many parenting interventions also have shown a positive impact on maternal health and well-being. However, there is limited evidence on the cost and cost-effectiveness of these interventions. We aimed to conduct an economic evaluation of a parenting intervention to improve children's development embedded in a social safety net programme in urban Bangladesh **Methods:** We conducted an economic evaluation study of a cluster-randomized trial where 599 mother and child dyads participated in a 12-month intervention. Mothers in the intervention group (n=299) attended fortnightly parenting sessions and received 800 Bangladeshi Taka US$ 6.20) unconditional cash transfer (UCT) from the Government of Bangladesh as a social safety net each month whereas the comparison group (n=300) received only UCT. The primary outcome was children's development and secondary outcomes were maternal well-being and children's quality home stimulation environment. We estimated the incremental cost-effectiveness ratios (ICERs) using the primary outcomes. We also presented our results as a cost-consequence analysis. Deterministic sensitivity analysis was conducted to assess the impact of the uncertain parameters on the findings. Costs were adjusted for inflation, discounted, and converted to 2023 US$. **Results:** The total intervention cost was US$30,183, comprising a start-up cost of US$ 4,080 and implementation cost of US$26,103. The cost per mother and child dyad was US$ 101. Compared to UCT arm, the intervention significantly improved children's cognitive, language and motor development. Additionally, mothers experienced benefits such as reduced depressive symptoms, decreased exposure to violence, improved quality of life, enhanced child care knowledge, and improved child stimulation environment. Cost-effectiveness analysis showed that an additional US$ 100 spending is estimated to lead to a 0.42SD improvement in cognition, 0.38SD in language and 0.17 SD in motor development. Sensitivity analyses supported these findings. **Conclusion:** The findings showed that the intervention is cost-efficient and potentially cost-effective when compared with the limited comparable studies in LMICs. The intervention had benefits beyond children's development including reductions in maternal depressive symptoms, violence against mothers, improvement in quality of life and children's quality stimulation environment. These findings support potential scale up of the intervention in Bangladesh and similar settings.

Ind-1686 Economic Evaluation of a Group-based Peer Support Intervention for Fathers of Young Children

PRESENTER: **Cindy Liang**
AUTHORS: Jemimah Ride, Casey Hosking, Rebecca Giallo

Background:

Early parenthood can be a particularly stressful time. Most interventions targeting parental mental health during this period focus on mothers, with fathers' risks of poor mental health relatively neglected, despite evidence that fathers' mental health is also important for children's outcomes. This economic evaluation aimed to assess the cost-effectiveness of a novel psychosocial intervention targeting this population.

Methods:

This economic evaluation was conducted alongside a pragmatic randomised controlled trial comparing a 6-week group-based peer support intervention (Working Out Dads) with usual care. The population consisted of fathers of young children (aged between 0-4), living in Victoria Australia, who were experiencing mental health difficulties or at risk of poor mental health and suicide. Intervention costs were determined from trial records. Healthcare utilisation was obtained from administrative public sector healthcare data, augmented by a resource use questionnaire to capture self-reported public and private sector healthcare utilisation, plus productivity and travel costs. The base case took a public sector perspective with costs measured in 2021 Australian dollars. Outcomes were measured in quality adjusted life years using the Assessment of Quality of life (AQoL-8D) instrument. Mean costs and quality of life years (QALYs) were compared between the groups at 6 months follow up to estimate the incremental cost-effectiveness ratio (ICER). Uncertainty surrounding the ICER was estimated using probabilistic sensitivity analysis. Scenario analyses were conducted from different perspectives.

Results:

The trial was conducted between January 2021 and January 2024. The sample consisted of 293 fathers (147 in the WOD intervention group, 146 in the usual care group), with a sample mean age of 36.6 years. Analyses are currently underway by the research team. Intervention cost was higher for the WOD group, and preliminary results based on resource use questionnaire data suggests that total public sector healthcare costs were lower for the intervention group compared to the usual care group. Quality adjusted life years were similar between two groups. Further findings will be available once linked data are analysed.

Conclusion

Despite the long-ranging impact of parental mental health problems during the early childhood period, both for parents and children, interventions targeting fathers' mental health have been relatively under-studied. This group-based peer support intervention offers potential to address risk factors for paternal depression and suicidality and could be a valuable tool. The results of this economic evaluation will be vital to inform policymakers considering implementation of this approach. It will identify the value of the intervention to the public sector and to

families, and identify key drivers of cost-effectiveness and sources of uncertainty regarding the results.

Ind-1221 The Long-Run Effects of Childhood Primary Health Care Expansion: Evidence from China s Barefoot Doctors

PRESENTER: **Feng Huang**
AUTHOR: Chunjie Wu

China’s barefoot doctor program was a model and inspiration for the famous 1978 Alma-Ata Declaration on primary health care, a low-cost strategy that achieved high health outcomes. Started in 1965, about 1.5 million peasants who received intensive three- to six-month training in anatomy, bacteriology, birth control, maternal and infant care, and other topics—were dispatched to provide basic health care for their rural communities. What are the long-run impacts of early childhood exposure to primary health care expansion? We collect a unique county-level dataset on the Barefoot Doctor program from historical gazetteers from 1965 to 1977. We then divided the number of barefoot doctors by the county population in that year to generate the density of barefoot doctors. We use data from the China Health and Nutrition Survey (CHNS 2000 to 2011) for long-term outcomes. Exploiting the variations in the density of barefoot doctors across counties and over time, we employ a cohort difference-in-differences model to identify the program's influence. First, counties had different numbers of barefoot doctors. We use a continuous measure of the intensity of treatment (i.e., density of barefoot doctors), and thereby capture more variation in the data. Second, there is substantial variation in early-life exposure within and between cohorts within the same county. The cohorts born between 1946 and 1954 were at least 11 years old when the PHCE was initiated in 1965; their early childhoods were not exposed to the program. Those born between 1962 and 1965 were partially exposed to the program, and those born between 1966 and 1970 were fully exposed. A primary threat to our identifying assumption is that barefoot doctors were not randomly distributed, so counties with more barefoot doctors could have systematically differed from those with fewer barefoot doctors before 1965. We assess the plausibility of this parallel-trend assumption in the following ways. First, we allow the trend to vary with the pre-determined county characteristics that were key observable determinants. In our main specification, we add the interactions of linear cohort trend and county-level variables in 1965, which include the number of hospital beds per 10,000 persons. We find that greater exposure to Barefoot Doctors significantly improved educational attainment and labor market outcomes in the long run. Additional exposure to Barefoot Doctors in utero has more significant effects. The effects are larger for females in educational attainment and labor force participation. We find that one underlying mechanism may be better primary health care and better health in childhood. This paper provides the first evidence that Barefoot Doctors have lasting impacts on health and economic outcomes and sheds light on primary healthcare expansion in other developing countries.

10:30 AM –12:00 PM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Orchid

Evidence to Inform Vaccine and Medicine Adoption Policies

MODERATOR: **Natalie Carvalho**, Melbourne School of Population and Global Health, Centre for Health Policy, Health Economics Unit, The University of Melbourne

Ind-2655 Cost-Effectiveness of Vaccination Strategies to Control Future Mpox Outbreaks in England

PRESENTER: **Josephine Walker**
AUTHORS: Peter Vickerman, Gayatri Amirthalingam, Siwaporn Niyomsri, Miranda Mindlin, Bennet Dugbazah, Xu-Sheng Zhang, Jessica Edney, Hamish Mohammed, Sema Mandal

Background: In 2022, a global outbreak of mpox occurred among gay and bisexual men who have sex with men (GBMSM). In England, the outbreak was controlled through reductions in sexual risk behaviour and vaccination of high-risk GBMSM. However, mpox continues to circulate, including an expanding outbreak in Africa, and so there is a risk of future outbreaks in the UK and other non-endemic countries.

Aim: We evaluated the most cost-effective vaccination strategy to minimise the risk of future mpox outbreaks among GBMSM in England.

Methods: A mathematical model of mpox transmission among GBMSM was developed to estimate the costs per quality-adjusted-life-year (QALY) gained for different vaccination strategies starting in 2024 (20-year time-horizon; 3.5% discount rate; willingness-to-pay threshold £20,000/QALY). The model was calibrated using English surveillance data from the 2022 outbreak and two community surveys. Reactive vaccination (only during outbreaks) and pre-emptive vaccination (continuous routine) strategies targeting GBMSM at high-risk for mpox were compared to no vaccination. Baseline projections incorporated importation of new mpox cases, and a vaccine effectiveness of 78%/89% for 5/10 years with 1/2 doses at £160/dose. Based on the 2022 outbreak, costs were estimated for case management, vaccination and public health responses during futures outbreaks.

Results: All vaccination strategies reduced future outbreaks, gained QALYs and reduced costs compared to no vaccination. Continuous pre-emptive vaccination (daily rate 41 doses) was most cost-effective, saving £38.4 million and gaining 546.3 QALYs over 20-years. Threshold analyses suggested vaccination of GBMSM at high-risk for mpox is cost-effective if the vaccine costs less than £636 per dose. Pre-emptive vaccination remains the optimal strategy across numerous sensitivity analyses, including for importation of more severe and transmissible clades, but the optimal vaccination rate can vary. Reactive vaccination only becomes more cost-effective when public health response costs are not included.

Conclusions: Pre-emptive vaccination of high-risk GBMSM is a crucial cost-saving strategy to prevent future mpox outbreaks. Similar

vaccination strategies should be considered for GBMSM in other countries to minimise the risk of future outbreaks.

Ind-1564 Evaluating the Cost-effectiveness of Typhoid Conjugate Vaccine's Introduction in Indonesia

PRESENTER: **Jonathan Hasian Haposan**

AUTHORS: Emma Watts, Hardini Tri Indarti, Alindina Anjani, Julie Bines, Virginia Pitzer, Ida Safitri Laksanawati, Asal Wahyuni Erlin Mulyadi, Jarir At Thobari

Background: Typhoid fever is a life-threatening infection caused by the bacterium Salmonella typhi and Salmonella paratyphi. The WHO estimates the global typhoid fever disease burden at 11-21 million cases annually, resulting in about 128 000–161 000 deaths per year. Despite the demonstrated high efficacy, safety, and long-term immunogenicity of Typhoid Conjugate Vaccines (TCVs), they have only been introduced in eight countries worldwide to date, not including Indonesia. Therefore, this study aims to estimate the cost-effectiveness of introducing TCV into the Indonesia's National Immunization Program (NIP).

Methods: We used a dynamic typhoid transmission model to project cases, hospitalizations, deaths, and disability-adjusted life-years (DALY) under different strategies. We then evaluated the cost-effectiveness of routine vaccination among children 9 months of age with and without a catch-up campaign (to 15 years of age) using the costing data from Surveillance of Typhoid Fever in Indonesia (SETIA) Study and other published data. We used incremental cost-effectiveness ratios to summarize the cost-effectiveness of the introduction of typhoid conjugate vaccine into the National Immunization Program in Indonesia, from both the healthcare sector perspective and societal perspective

Results: Over a 10-year time horizon, routine TCV program would cost USD 106.1 million, rising to USD 282.4 million with an additional catch-up campaign. Routine program could avert 1.4 million cases, 828 thousand outpatients, 14,800 hospitalizations, and 9,000 deaths caused by typhoid fever. Compared to no vaccination, the ICERs of routine program were USD 240.7 and 239.1 per DALY averted (5% GDP per capita), respectively from healthcare sector and societal perspectives. Compared to routine only, the ICERS of combined program were USD 521.5 and 519.8 per DALY averted (11% GDP per capita), respectively from healthcare sector and societal perspectives. Both strategies are highly cost-effective at a willingness-to-pay threshold of 25% GDP per capita, with combined strategy offering the greatest overall benefits.

Conclusion: Introducing TCV into Indonesia's NIP, particularly with a catch-up campaign, could substantially reduce typhoid-related morbidity and mortality, and is highly cost-effective. We therefore recommend that policymakers adopt TCV into the national schedule, prioritizing the catch-up campaign to maximize benefits.

Funding: This work was supported by BMGF (Gates Foundation) grant to Murdoch Children's Research Institute (Melbourne – Australia) in collaboration with Center for Child Health, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada (Yogyakarta – Indonesia)) [INV-003867] and a BMGF (Gates Foundation) grant to TyVAC 2.0 [INV-030857].

Conflict of interests: None to be declared

Keywords: cost effectiveness, typhoid conjugate vaccine, Indonesia, introduction

Ind-1909 Health and Economic Impact of Locally Developed Bivalent HPV Vaccination in China

PRESENTER: **Peixuan Zhang**

AUTHORS: Xinyu Wang, Ying Xu, Zhong Liu, Andrew Clark, Ye Yao, Weibing Wang, Kim Mulholland, Kaja Abbas

Abstract

Background: China has two recently domestically manufactured bivalent HPV vaccines (Cecolin and Walrinvax), but they are excluded from China's National Immunisation Programme. We aim to estimate the health and economic impact of vaccinating adolescent girls to protect against cervical cancer using these vaccines in China.

Methods: In collaboration with stakeholders in China, we used a static cohort model to estimate the lifetime health and economic impact of vaccinating a single-aged girl cohort during 2025-2034 with Walrinvax or Cecolin. The primary outcome measure was the cost (2023 US$) per disability adjusted life year (DALY) averted from a government perspective. We parameterised the model with country-specific data from the literature, government websites, and global databases.

Findings: Compared to no vaccination, a single-dose schedule of Cecolin for 14-year-old girls would be the most cost-effective option (100% probability of being cost-effective at a threshold of 1xGDP per capita). The one-dose schedule would achieve a 37%-45% health gain over the lifetime of the 2025-2034 vaccinated cohort. The two-dose schedule would increase costs by 49% and avert 20% more cases, assuming 80% protection from the first dose. Targeting high-burden regions in the first 5 years would be more cost-effective, but result in 53% fewer health gains in comparison to national-level vaccination. The estimated annual budget (310-808 million US$) would account for 0.013-0.034% of government health expenditure.

Interpretation: A domestic bivalent HPV vaccination programme would be cost-effective in China. Under short-term supply or budget constraints, adopting a one-dose schedule or prioritising high-burden regions would be optimal.

Ind-2238 The Quality of Health Economic Data Supporting Economic Evaluations of Vaccine Programmes in the United Kingdom (QUEST)

PRESENTER: **Phuong Bich Tran**

AUTHORS: Hei Hang Edmund Yiu, Sophie Staniszewska, Mr. Stavros Petrou, Edward M Hill, Nia Roberts, Matt J Keeling, Corinna Clark, Omar El Deeb, Joseph Kazibwe

Background: Public health policies in the UK rely on economic evaluations, but debates around the frameworks used by the National Institute for Health and Care Excellence (NICE) and the Joint Committee on Vaccination and Immunisation (JCVI) often overlook the quality of input data. Challenges persist in obtaining sufficient and reliable data on costs and health outcomes for economic evaluation models. This study aims to assess the quality of health economics (HE) data, including cost and health utility values, used in vaccine evaluations informing JCVI decisions and explore challenges in sourcing and applying them. Our research includes a systematic review and a qualitative study.

Objectives and methods: The primary objective of the review is to compile and analyse evidence on the quality of HE data used in economic evaluations of vaccines in the UK, aiming to provide strategic recommendations for improving the reliability, consistency, transparency, and comparability of future health economic research on vaccines. A protocol will be registered with PROSPERO and conducted following PRISMA 2020 guidelines. We will assess studies from a list of vaccine-related economic evaluations provided by JCVI that have influenced JCVI decisions since 2000. Over 36 studies across 15 vaccine programmes will be included. Data extraction and analysis will involve general quality assessment using the CHEERS 2022 checklist and the Proposed Framework for Quality Assessment of Decision-Analytic Models, as well as identifying sources for the HE data. Specific attention will be given to evaluating the application of cost data and the quality and relevance of health utility values for vaccination models using specific checklists relevant to each data type. A narrative synthesis will summarise findings, with subgroup summaries examining variations by vaccine types, age groups, data sources, etc.

To enhance these findings, the qualitative component will gather insights from researchers and modelers, focusing on their perceptions of HE data quality and exploring challenges in data identification, access, analysis, and reporting, especially concerning UK vaccine evaluations informing JCVI decisions. Fifteen participants, including policymakers and evaluators recruited through JCVI and the Department of Health and Social Care, will be interviewed or, if time-limited, engaged in focus groups. Data will be anonymised, stored securely, and analysed via NVivo15 using thematic analysis. Findings from both the review and interviews will be synthesised for the final manuscript, highlighting key insights and recommendations. Members of the public will be involved across all stages of the project. Ethics approval will be obtained from the University of Oxford Central University Research Ethics Committee.

Discussion and implications: The quality of HE data inputs into economic evaluations impacts the validity of assumptions, generalisability of findings, and robustness of sensitivity analyses. Improved data quality holds promise for producing reliable, credible, and policy-relevant economic evaluations of vaccines, informing decision-making and maximising the public health impact of vaccination programmes. We have conducted a pilot data extraction for the review and anticipate having preliminary results by the time the IHEA Congress takes place next summer.

Ind-1645 Leveraging AI for Policy Documents Review: Case study using Public Summary Documents of the Pharmaceutical Benefits Advisory Committee

PRESENTER: **Yingying Wang**
AUTHORS: Ms. Marie-Anne Boujaoude, Yi-shin Yang, Cate Bailey, Kim Dalziel, Nancy Devlin, Natalie Carvalho

Background and Objectives:

Traditional methods for systematic review of policy documents are slow and unsustainable in the face of rapidly changing public health policies. Artificial Intelligence (AI), including natural language processing (NLP) techniques and large language models (LLMs) powered by NLP, has the potential to revolutionize the review of policy documents. This study aims to determine whether NLP tools and LLMs were able to reliably extract key information from policy documents. We use the Pharmaceutical Benefits Advisory Committee (PBAC) Public Summary Documents (PSDs) in Australia as a case study. The PBAC makes public funding decision recommendations about medicines. This study is embedded within a broader project looking at factors influencing PBAC outcomes.

Methods:

We gathered 263 PBAC PSDs from 2019 to 2024 from the PBAC website. We compared three approaches for reviewing PBAC PSDs: manual review, NLP tools available in Python (e.g., spaCy, NLTK), and ChatGPT-4o. The extracted information included both textual and numerical data: PBAC outcome, incremental cost effectiveness ratio (ICER) ranges for the base case and sensitivity analysis, population characteristics, disease area, intervention, comparator, efficacy and safety claims, budget impact, uncertainties in clinical and economic evidence, equity considerations, price negotiations, and consumer comments. NLP tools were programmed to perform rule-based and targeted extractions, focusing on structured outputs from all documents. For ChatGPT-4o, a sample of 30 documents were randomly selected and queried the model using pre-defined extraction rules. Manual review served as the benchmark, involving human reviewers extracting the same information.

Results:

Compared to manual review, NLP tools were effective at locating sections containing key details, adhering strictly to predefined coding rules. However, NLP tools may miss content that should be captured due to not being defined in coding. NLP tools did not generate new information; instead, they only summarised and structured outputs based on the coding logic provided. ChatGPT-4o, on the other hand, is user-friendly and excels at general summarization tasks. It performs well with straightforward textual information, such as identifying disease areas. However, it struggles with extracting precise numerical data, such as ICERs or budget impacts, even when provided with increasingly specific instructions. Additionally, we observed fabrication of data in ChatGPT-4o's outputs: some of the information (both numerical and textual data) did not exist in the original documents. Both NLP tools and ChatGPT faced challenges when dealing with complex documents. For instance, documents with addendum where multiple base case ICERs were reported were less likely to yield precise results.

Conclusions:

Both NLP tools and LLMs may facilitate the review of policy documents. NLP tools are good at extracting original text when built on robust coding frameworks and ChatGPT-4o performs well in general summarization tasks. However, NLP tools' reliance on extensive coding and the risks associated with ChatGPT-4o's fabrication of outputs, combined with the complexity of policy documents, highlight the ongoing need for manual review to ensure accuracy of decision-making at the current time.

10:30 AM –12:00 PM TUESDAY [Health Beyond The Health System]

Bali International Convention Centre – Jasmine

Sin Taxes

MODERATOR: **John Cawley**,

Ind-46 Excise Taxes Targeting Unhealthy Foods in Tonga: Have They Worked?

PRESENTER: **Andrea Teng**, University of Otago
AUTHORS: Viliami Puloka, Nick Wilson, Alice Kim

Background: Fiscal policies are recommended by the World Health Organization for promoting a healthy diet, but while taxes are common for sugar-sweetened beverages, they less commonly target unhealthy foods. The Pacific Island nation of Tonga has some of the highest obesity and diabetes rates in the world and has introduced excise taxes on unhealthy foods. The aim of this study was to examine the impact of excise tax increases in Tonga between 2013 to 2018 on food prices and food import volumes, including taxed and untaxed items.

Methods: Interrupted time series analysis was applied to measure the first-year impacts of each excise increase on indicator food prices (retail outlet surveys by the Tonga Department of Statistics) and import volumes (from the Tonga Ministry of Revenue & Customs). Nine tax increases were investigated, varying from T$0.40/kg to T$2.50/kg ($US0.17/kg to US$1.08/kg). These corresponded to increases of at least 10% in import price (with a 28% mean increase). Generalised least squares regression (GLS) was used to do segmented regression analysis fitting a linear model on monthly data. Observed post-tax trends were compared with a no tax scenario, based on the projected pre-tax trend, with adjustment for autocorrelation when it was present, and for potential time-varying confounding by GDP per capita, international visitor numbers, month, T$/US$ exchange rate, oil prices (proxy for transport costs), and international food prices (where relevant). For percentage change outcomes, we used bootstrapping to produce 95% confidence intervals, and average effects across foods were calculated from random effects meta-analysis. Controlled and sensitivity analyses were also carried out. All analyses were done in R 4.3.1.

Results: In the first-year post-tax, retail prices increased for eight of the nine indicator foods, with an average increase of 13% (95%CI: 5% to 21%). Five price increases were statistically significant: mutton flaps (20% increase), corned beef (20%), ice cream (11%), salted beef (6%) and mayonnaise (3%). Correspondingly, import volumes decreased for eight of nine taxed foods with an overall mean decrease of 41% (95%CI: 17% to 58%). Two import volume decreases were statistically significant: sausages (68% reduction) and ice cream (72%). Of the locally produced products, only sausages (taxed at half the level of imports), appeared to have an increasing production trend. Locally produced sausages only reached 13% of the total sausage market in volume by 2019. Findings were shared with stakeholders in Tonga mid-2024.

Conclusions: Unhealthy food excise taxes in Tonga were associated with increased prices and decreased imports of the taxed foods. Changes could not be explained by increased local production. These findings add to the existing international evidence that food excise taxes can be effective in raising prices and decreasing supply of unhealthy foods. Policy improvements such as tax level adjustments for inflation and equivalising tax levels across imported and locally produced foods could be used to support greater nutritional benefits.

Ind-221 Nudging Nutrition: Lessons From the Danish ""Fat Tax""

PRESENTER: **Giovanni Mellace**
AUTHORS: Nadja van t Hoff, Christian Møller Dahl, Sinne Smed

Taxes are increasingly recognized as an effective policy tool for influencing health behaviors. While growing evidence supports the effectiveness of several taxes, such as the sugar tax, much less is known about the impact of taxes on saturated fats. Existing research often relies on simulation models or uses observational data without geographic control groups, limiting the ability to draw causal inferences about how such taxes shape consumer behavior. Our study addresses this gap by providing the first causal analysis of a tax on saturated fat and its effects on consumer behavior.

In October 2011, Denmark introduced the world's first and, to date, only tax specifically targeting saturated fats. However, this tax was repealed in January 2013. Leveraging exogenous variation from untaxed consumers in Northern Germany, we employ a difference-in-differences approach to estimate the causal effects of both the introduction and repeal of the tax on consumption and expenditure across eight targeted product categories. Using state-of-the-art difference-in-differences method, we control for observed household characteristics, employ a doubly robust estimation technique, and provide conservative confidence intervals, enhancing the reliability of our findings.

Our results reveal significant heterogeneity in the tax's impact across different products. During the taxed period, consumption of bacon, liver sausage, and cheese notably declined, particularly among low-income households. In contrast, expenditure on butter, cream, and margarine rose, driven by higher prices. Interestingly, we did not observe differences in price sensitivity between high- and low-income households, suggesting that the tax disproportionately affected low-income groups.

Following the repeal of the tax, consumption did not return to pre-tax levels. Instead, we observed an overall increase in consumption of certain products, raising concerns about potential unintended consequences from the brief implementation of the tax. Additionally, we found evidence of increased cross-border purchases of butter by households living within 50 km of the German border, though we did not find strong evidence of spatial heterogeneity in the tax's broader effects.

These findings suggest that while the Danish saturated fat tax was effective in reducing consumption of some targeted products, its regressive impact on low-income households and the rise in cross-border shopping highlight important challenges for policymakers. When designing and implementing food-related taxes, it is essential to consider these unintended effects to ensure both equitable outcomes and sustained behavioral changes. Future policies should explore complementary measures to maintain long-term effects after the repeal of such taxes.

Ind-231 Demystifying Anti Health Tax Advocates Arguments: Impact of Taxation on Production, Sales, Revenue and Consumption of Unhealthy Products in Uganda

PRESENTER: **Richard Ssempala**, Makerere University School of Economics
AUTHORS: Eric Ssegujja, Henry Zakumumpa, Freddie Ssengooba

Background: Globally, it is increasingly being recognised that consumption of selected products perceived to be unhealthy contribute to the burden of Non-Communicable Diseases (NCDs) such as heart disease, stroke, cancer, diabetes and chronic lung disease. However, adoption of measures including fiscal policies to address the challenge remains contested and with limited literature about these measures especially in Low and Middle-income countries. To address this gap, we focused our study on excise duty and Value Added Tax (VAT) -tax regimes on selected unhealthy commodities in Uganda such as alcohol, tobacco and sugar sweeten beverages to assess their impact on production, sales, revenue and consumption for the period of 10 financial years from FY 2014/15- FY 2023/24. **Methodology:** We used quantitative approaches to analyse data given its strengthen in generating knowledge to measure the impact and identifying relationships. The data was extracted from Government of Uganda Revenue collection body (Uganda Revenue Authority); supplemented by qualitative findings from documentary analysis of parliamentary records related to the respective tax bills and Acts. Content analysis was adopted as an analytical technique for the qualitative data using Atlas.ti data management software. **Results:** Overall, results revealed four mainly findings; Firstly, the production of unhealthy commodities during the studied period was on an increase with greater quantities observed in Non-alcoholic drinks (soft drinks), followed by alcohol/ Beers and cigarettes. Secondly; despite of an increase in excise duty, sales of unhealthy commodities reflected a general increase year on year. Non-alcoholic commodities and alcohol/ beers registered the higher sales following increase in excise duty on the same with highest sales observed in the Fy 2022/23. Thirdly; Revenues collected from unhealthy commodities has generally been increasing irrespective of the tax rates. Specifically, revenues from sale of beers and non-alcoholic drink has been increasing; reduced revenue are only seen during covid-19 period. For cigarettes, revenues negatively respond to the tax rates. Lastly; Consumption of the commodities continued to increase across the studied period. From the studied period it can be deduced that the current tax rates have not had a statistically significant negative impact on the production, sales, consumption and revenues collected by Uganda Revenue Authority from the sale of these commodities. **Conclusion:** Taxation of unhealthy commodities had minimal/insignificant impact on production, sales, revenues and consumption reflecting the feasibility of introduction of health taxes as recommended by WHO if NCDS are to be reduced. Results have further demonstrated that minimum damage can be inflicted on the economy a key framing opponents of such taxes often front to scare away government from prioritising health taxes.

Ind-1958 Leveraging Parental Preferences to Inform Policy on Sugar-Sweetened Beverages: A Discrete Choice Experiment

PRESENTER: **Nyamdavaa Byambadorj**
AUTHORS: Undram Mandakh, Rohan Best, Kompal Sinha

This study addresses growing concerns regarding childhood obesity and cardiovascular diseases by exploring the effects of possible policy measures on the intention to choose sugar-sweetened beverages (SSBs) in Mongolia, a low-income country. Focusing on parents' preferences for purchasing SSBs, we employed a stated preference choice experiment to analyse how various product attributes, including price, labelling, sugar content and store placement, affect parents' purchase decisions. Price increases were the most effective intervention, with larger increases leading to a substantial reduction in purchase probability. Labelling also played a crucial role, particularly graphic warnings, which strongly deterred selection. Reducing sugar content positively influenced preferences. Also, less prominent store placement lowered SSB selection probabilities. Additionally, estimates of willingness to pay suggest consumers are less willing to purchase SSBs with graphic warning labels and placement in the back row and bottom level. These findings highlight the importance of integrating multiple regulatory measures to effectively curb SSB consumption and mitigate associated health risks in Mongolia. **Keywords** Sugar-sweetened beverage, Discrete choice experiment, Price elasticity, Marginal effects, Willingness to Pay

abs-os750 Exploring Consumer Preferences for Sugar-Sweetened Beverages in East Africa: Evidence from a Discrete Choice Experiment

PRESENTER: **Mr. Senzo Mthembu**
AUTHORS: Hassan Haghparast-Bidgoli, Gershim Asiki

Sugar-sweetened beverages (SSBs) are a significant contributor to the growing burden of non-communicable diseases (NCDs) in East Africa. While public health policies increasingly target SSBs through pricing and taxation strategies, there is limited evidence on consumer preferences and their potential behavioural responses to such interventions. This study employs a Discrete Choice Experiment (DCE) to examine consumer trade-offs and preferences for SSB attributes, including price, packaging, and sugar content, in the context of potential taxation and reformulation policies.

The study surveyed 1,200 respondents across three regions in Kenya: Nairobi, Nyanza, and Coastal Kenya. Participants completed a structured questionnaire capturing demographics, SSB consumption patterns, and choice tasks involving hypothetical purchasing scenarios. Each choice set presented five SSB brands with varying attributes—price (tax included), sugar reduction levels, and package size—alongside a "none of these" option. Data were analysed using multinomial logit (MNL) and latent class models (LCM) to estimate consumer preferences, attribute importance, and market segment heterogeneity. Price and cross-price elasticities were calculated to assess potential brand-switching behaviours under tax scenarios.

Preliminary findings indicate that price is the most influential factor in consumer decision-making, with participants displaying significant sensitivity to price changes. While sugar reduction was moderately preferred, further reductions reduced product appeal. Packaging size also influenced preferences, with smaller sizes favored over bulk options. Latent class analysis identified three consumer segments: price-sensitive (50%), health-conscious (30%), and brand-loyal (20%). Simulated tax scenarios revealed potential shifts towards lower-priced brands or reduced consumption.

This study provides critical insights into consumer preferences for SSBs in Kenya and highlights the potential for price-based interventions to reduce SSB consumption. These findings can inform evidence-based public health policies targeting the rising burden of NCDs in East Africa.

10:30 AM –12:00 PM TUESDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Singaraja

Evaluation of Mental Health Programs/Outcomes

MODERATOR: **Suja S Rajan**,

Ind-18 Saving Lives, Saving Money? The Effect of a Multisectoral Suicide Prevention Program on a Healthcare System

PRESENTER: **Olukorede Abiona**, University of Technology, Sydney (UTS)
AUTHORS: Henry Cutler, Mona Aghdaee, Dandan Yu, Yuanyuan Gu

The World Health Organization (WHO) made preventing suicide a global imperative in 2014, suggesting to governments they reduce their suicide rates by implementing a comprehensive multisectoral suicide prevention strategy. Some European governments have since implemented this strategy type, although evaluations of their effectiveness are hampered by small sample sizes, confounding factors and low data quality. This study estimates the impact of a large, community based multisectoral suicide prevention intervention on healthcare resource use and costs in Australia. We exploit a stepped trial conducted between 2017 and 2020 and use a large linked state government administrative dataset with millions of observations from emergency department presentations, inpatient hospital care, primary care, allied health and medicine supply. Patients from a population of one million people in four local health networks exposed to the suicide prevention intervention were matched to patients from local health networks that were not exposed, using entropy balancing. A multigroup, staggered difference-in-differences approach was employed to account for different intervention start dates and for potential heterogeneous effects across local health networks and time. We present the Intention to Treat (ITT) causal effects of the intervention on healthcare resource use and costs. The effect is disaggregated across time and each treated local health network. Heterogeneity within each local health network is explored by separately estimating ITT on emergency department presentations, inpatient hospital care, health care delivered outside the hospital and pharmaceutical supply. Sensitivity analysis tested whether results are robust to an alternative estimator and whether results are sensitive to a placebo treatment period or placebo treatment group. Our study provides valuable insights into the potential impact of large community based, multisectoral suicide prevention interventions on healthcare systems, to better understand the mechanisms of impact associated with these types of strategies. This could help other countries better design, implement and scale-up a comprehensive multisectoral suicide prevention strategy.

Ind-405 Area-level Mental Health and Health Care Utilization Impacts of Welfare Reform: The Case of Universal Credit Natural Migration in England

PRESENTER: **Silas Amo-Agyei**
AUTHORS: Luke Munford, Matt Sutton, Konstantinos Daras

Background: The introduction of Universal Credit (UC) in 2013 marked a substantial overhaul of the UK welfare system, consolidating six means-tested benefits into a single payment for working-age individuals. While the policy aimed to streamline benefits and incentivize employment, evidence suggests that it may have unintended consequences for the mental health of claimants. Limited existing research points to negative mental health impacts, likely stemming from the complex claims process, heightened conditionality, financial insecurity, and reduced benefit payments. Given UC's focus on low-income households, these short-term mental health effects could exacerbate health and broader social inequalities. **Research question:** What is the impact of UC's natural migration on small-area mental health and healthcare utilization across England? What is the broader societal cost of mental health issues arising from this welfare reform, and what are the associated costs of mental health care utilization due to the UC rollout? **Methods:** This study employs staggered difference-in-differences techniques to evaluate mental health trends at the small-area level, specifically within Lower Super Output Areas (LSOAs), which were exposed to UC at varying times. We treat the phased rollout as a natural experiment. Our primary data source is the Small Area Mental Health Index (SAMHI) created by Daras and Barr (2021), offering annual measures of mental health across LSOAs in England from 2011-2019. Mental health indicators, such as average daily antidepressant usage, depression prevalence, and mental health-related hospital attendance, are derived from NHS Digital and the Quality and Outcomes Framework. Additional population-level data is sourced from the Office for National

Statistics (ONS) and the UK Department of Work and Pensions (DWP). **Results:** We find that LSOAs exposed earlier to UC exhibit worse mental health outcomes compared to areas with later exposure. Baseline estimates suggest UC migration has increased overall mental health needs by 0.038 standard deviations (SD), depression rates by 0.03%, mental health-related hospital attendance by 0.036 SD, and average daily antidepressant usage by 0.45 units per person. These effects hold robustly across multiple model specifications and sensitivity checks. The findings also indicate substantial societal costs due to the mental health impacts of UC migration and a significant rise in mental healthcare utilization costs attributable to the reform. **Conclusions and implications for policy and practice**: Our results underscore the adverse mental health consequences of UC migration at the small-area level, along with the corresponding rise in healthcare utilization and societal costs, stressing the impact on local healthcare systems. Policymakers should consider these findings as evidence of the potential health-related repercussions of welfare reforms like UC. Future welfare reforms could benefit from strategies to mitigate such unintended mental health effects, reducing the strain on healthcare services and supporting overall population well-being.

Ind-1572 The Impact of Mental Health Parity on Self-Assessed Mental Health Among U.S. Military Beneficiaries

PRESENTER: **Jangho Yoon**, Uniformed Service University

Aim: In the U.S., mental health insurance benefits have traditionally included fewer covered services and higher deductibles, copayments, and coinsurance compared to medical care benefits. In October 2016, TRICARE, a health care program providing comprehensive healthcare services to 9.6 million military beneficiaries (active-duty and civilians), implemented a behavioral health parity rule intended to reduce disparities between behavioral health and medical care benefits. This research examined changes in self-assessed mental health levels among civilian TRICARE beneficiaries attributable to the parity implementation.

Methods: We analyzed observational data from the 2010-2020 Medical Expenditure Panel Survey, the national healthcare survey, which collects comprehensive information on verified health conditions and sociodemographic characteristics in a nationally representative sample of the non-institutionalized U.S. civilian population, including TRICARE beneficiaries. The sample included non-elderly adults aged 18-64, comprising 1,166 TRICARE beneficiaries and 72,996 privately insured or uninsured individuals. Outcomes included perceived and validated mental health measures: a binary measure of self-assessed poor mental health; Mental Composite Summary (MCS) scores derived from the Short-Form 12, ranging from 0 (worst) to 100 (best); binary measures of serious mental illness (SMI) and moderate mental illness (MMI) based on the Kessler Psychological Distress Scale and its validated cut-points; and an indicator for potential depression based on the 2-item Patient Health Questionnaire (PHQ-2) and its validated cut-point. We used the difference-in-difference model to compare pre-post changes in the outcomes for the policy intervention group of TRICARE beneficiaries with counterfactual trends from the civilian counterparts. We then employed the difference-in-differences-in-differences model, further differencing the pre-post and intervention-control changes in the outcomes for individuals with SMI and other individuals without SMI. All estimates were adjusted for comprehensive demographic and socio-economic characteristics as well as various time trends. To support the validity of our study design, we confirmed that our sample satisfied the parallel trend assumption. All estimates were survey-weighted and adjusted for a multistage complex survey design.

Results: Behavioral health parity implementation was associated with a 7.3 point increase in MCS scores ($p=.003$), a 25.5 percentage-point decrease in the probability of having SMI ($p<.001$), a 20.5 percentage-point decrease in the probability of potential depression ($p=.013$), and a 9.7 percentage-point decrease in the probability of reporting poor mental health ($p<.001$) among civilian TRICARE beneficiaries. The beneficial effects of behavioral health parity increased in magnitude as family income levels decreased. Specifically, behavioral health parity was associated with a 55.1 percentage-point decrease in the probability of SMI among individuals living below the poverty level ($p = .001$), a 35.1 percentage-point decrease among those with low family income ($p < .001$), a 28.7 percentage-point decrease among those with moderate family income ($p < .001$), and a 10.4 percentage-point decrease among individuals with high family income ($p < .001$). Similar patterns were observed for MCS scores, potential depression, and self-assessed poor mental health.

Conclusion: The implementation of behavioral health parity led to significant overall improvements in self-assessed mental health among civilian TRICARE beneficiaries, with particularly pronounced benefits for those with greater financial need.

Ind-1628 Violations of the Male Breadwinner Norm and Mental Health

PRESENTER: **Rachel Knott**, Monash University
AUTHORS: David Johnston, Nidhiya Menon

Evidence highlights that mixed-gender marriages are governed by several traditional norms. These include that married women are shorter, younger, and lower-earning than their spouses. We focus on the last of these traditions, the ‘male breadwinner’ norm. Although studies have evaluated the costs of violating the male breadwinner norm, little is known about the mental health consequences. We explore this issue using national administrative tax data, healthcare records and locations data linked with Census data on more than 970,000 couples in Australia who were residing together and working at the time of 2011 Census. We supplement the administrative data with subjective data on wellbeing, satisfaction and family life from couples surveyed in the Household, Income and Labour Dynamics in Australia (HILDA) study.

We show that violations of the male breadwinner norm are associated with meaningful outcomes. Specifically, after controlling for male and female earnings, education, occupation, industry, location, and other characteristics, our administrative data reveals that when women out-earn their husbands, the likelihood of separation in the next three years increases by a considerable 17.4% (relative to the mean). Survey data supports the hypothesis that the separations are caused by martial strain. In marriages violating the male breadwinner norm, women are more satisfied with their pay, while men are less satisfied. Relatedly, financial decision-making power shifts towards women. Consequently, men report lower mental wellbeing, and women report lower relationship satisfaction.

Our main results suggest that the reported differences in marital outcomes lead to mental health issues for men. Men who earn less than their wives are significantly more likely to use prescribed antidepressants, anxiolytics and sedatives in future years, with estimates largest among men without a history of such medication use. For example, it is estimated that the use of sedative medications is 10.3% higher among men

without a history of sedative use. In contrast, estimated associations are small for women, indicating similar health outcomes for women who earn more and less than their spouses. We also find small, statistically insignificant associations from regressions using different (placebo) relative income cut-offs and health outcome variables (e.g. prescribed medication for physical health conditions). These results support the interpretation of our results: that violation of the male breadwinner norm causes increased stress within the household, particularly among men, leading to worse mental health outcomes.

Ind-1942 Association of Legalizing Youth-Friendly Cannabis Edibles and Extracts with Adolescent Cannabis Use: Quasi-Experimental Evidence from Canada

PRESENTER: **Shweta Mital**
AUTHOR: Hai Nguyen

Background: In October 2018, Canada legalized sale of dried or fresh cannabis and cannabis oil to individuals above the minimum legal age. Subsequently, in October 2019, cannabis edibles and extracts was legalized in most provinces, including products that appeal to adolescents such as cannabis chocolates, candies, desserts and cannabis vaping products. An exception was the province of Quebec, which banned sales of cannabis edibles and cannabis vaping products that could entice children and youths. Quebec's government stated that these bans would protect children and youth from accidental cannabis poisoning and reduce normalization of cannabis use among youths. There is not yet evidence on the impacts of legalizing youth-friendly cannabis edibles and extracts on adolescents. **Research Aims:** Our study has three objectives. We first examine the effects of legalizing youth-friendly cannabis edibles and extracts on overall prevalence of adolescent cannabis use. Next, we study the impacts on modes of cannabis consumption (i.e., cannabis edibles, cannabis smoking and cannabis vaping) and the co-use of alcohol and cannabis. Finally, we assess the relationship between the legalization and adolescents' perception of harm associated with cannabis use. **Methods:** We use nationally-representative, individual-level survey data for a large sample of over 106,000 youths in grades 7 to 11 and difference-in-differences design to compare changes in outcomes in provinces that legalized cannabis edibles and extracts in October 2019 with changes in Quebec where youth-friendly cannabis edibles and cannabis vaping products were banned. Outcomes of interest were cannabis use in past 12 months; past 12-month use of edible cannabis use, cannabis smoking, cannabis vaping and co-use of alcohol and cannabis; and perception of harm from occasional and regular cannabis use. **Results:** The legalization was associated with 3.8 percentage points (p=0.01) or 26% increase in past 12-month cannabis use and 3.4 percentage points (p<0.01) or 43% increase in use of cannabis edibles among adolescents. While there was no statistically significant change in cannabis vaping associated with the legalization, cannabis smoking increased by 4.4 percentage points (p<0.01) or 34% and co-use of alcohol and cannabis increased by 2.4 percentage points (p=0.02) or 28%. The legalization was also associated with a lower perception of harm from occasional cannabis use. **Conclusion and Policy Implications:** The legalization of cannabis edibles and extracts increased not only edible cannabis use and cannabis smoking among adolescents in grades 7-11 but also the overall prevalence of cannabis use and co-use of alcohol and cannabis. Policy measures to curb adolescents' access to cannabis edibles and extracts and raise awareness about harms from cannabis use are needed.

10:30 AM –12:00 PM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Jakarta B

Economic Evaluations of Infectious Diseases

MODERATOR: **Darshini Govindasamy**,

abs-os35 Return on Investment for Typhoid Vaccination in Low-Middle Income Countries

PRESENTER: **Haijun Zhang**
AUTHORS: Bryan Patenaude, Salin Sriudomporn

Background: Typhoid still has substantial burden among low-and middle-income countries (LMICs). The World Health Organization has recommended the programmatic use of typhoid conjugate vaccines (TCV) in endemic countries. The demand for TCV is projected to increase with rising country adoption and continuation of the vaccine. We conducted a return-on-investment (ROI) analysis of TCV vaccine for both routine immunization, and supplemental immunization activity (SIA) campaigns among 26 Gavi-supported LMICs from 2021-2030.

Methods: We estimated the economic benefits through the cost-of-illness (COI) approach using the cases and deaths averted generated by the International Vaccine Institute (IVI) and the Yale School of Public Health (YSPH). COI includes both direct (treatment and transportation) and indirect costs (productivity loss) averted. Costs of the immunization program include vaccine costs (doses, syringes, injection supplies) and immunization delivery costs (personnel, cold chain equipment and maintenance, transportation, distribution services, and other recurrent costs). We estimated the ROI by dividing the net benefits (benefits minus costs) by costs of TCV. For TCV SIA, a base case of $2.48 delivery cost per dose was used and a measle SIA delivery cost at $1.13 per dose was used as a lower bound to determine the ROI at different delivery cost.

Results: The total COI between 2021-2030 under Gavi supported countries was estimated at $7.0 billion for TCV routine immunization, and $8.9 billion for TCV SIA. The total cost of TCV routine immunization is estimated at $0.97 billion, and $2.7 billion for TCV SIA under the base case scenario. For the lower bound of $1.13 delivery cost per dose, the total TCV SIA immunization cost is reduced to $1.4 billion. The ROI for TCV routine immunization was estimated at 6.25. For TCV SIA, the ROI estimated using the base case delivery cost of $2.48 was estimated to be 2.33.

Conclusions: Our findings suggest that both TCV routine and SIA yield substantial positive ROIs for Gavi supported countries. The evidence generated will allow policymakers to determine and advocate for the most efficient strategies for resource mobilization and investment to ensure sufficient coverage and sustainable immunization programs, globally.

Ind-336 Cost-Effectiveness of Long-Acting Injectable Cabotegravir for HIV Prevention Among Men Who Have Sex with Men in China: A Mathematical Model

PRESENTER: **Bo Zhang**, Sun Yat-Sen University

AUTHORS: Pengyue Guo, Hao Lin, Yijing Wang, Jing Gu, Chun Hao, Wangnan Cao, Jinghua Li

Background: Long-acting injectable cabotegravir (CAB-LA) is recommended by the World Health Organization for HIV prevention due to its safety and high efficacy. Compared to daily oral pre-exposure prophylaxis (PrEP), CAB-LA does not rely on strict adherence, which may alleviate challenges in many Asian countries where HIV and same-sex behaviors are highly stigmatized. Recently approved in China and priced at 7,918 CNY per injection, the cost-effectiveness of CAB-LA at this price has not been well studied. **Objectives:** We aimed to evaluate the cost-effectiveness of CAB-LA alone and in combination with daily oral PrEP among men who have sex with men (MSM) in China over a 20-year period (from 2024 to 2043). **Methods:** We used a compartment model of the HIV epidemic developed by our team to assess the cost-effectiveness of different interventions, compared to no PrEP use. These interventions included daily oral PrEP only, CAB-LA only, and a combination of both. Each strategy was evaluated under four coverage scenarios, ranging from 25% to 100% in 25% increments among high-risk MSM. Incremental cost (international dollars, Int.$) per quality-adjusted life year (QALY) gained was assessed as the primary outcome, along with incremental QALYs, incremental costs, and healthcare savings. The model incorporated the recent price of 7,918 CNY per CAB-LA injection and different discount rates to explore the health economic effects. **Results:** At the price of 7,918 CNY per injection, the cost-effectiveness of different PrEP types compared to the status quo varied significantly. Oral PrEP demonstrated the highest cost-effectiveness, with an average cost-effectiveness ratio (CER) of 8,090-8,470 Int.$/QALY, while CAB-LA had a lower cost-effectiveness, with an average CER of 60,520-68,320 Int.$/QALY compared to the status quo. The optimal strategy involved a gradual transition from exclusive oral PrEP use to a combination of oral PrEP and CAB-LA, ultimately leading to full CAB-LA use. However, CAB-LA is not cost-effective compared to oral PrEP under these conditions. The incremental cost-effectiveness ratio (ICER) for switching from oral PrEP to a combination strategy was 218,750 Int.$/QALY, for transitioning to exclusive use of CAB-LA use, the ICER was 274,500 Int.$/QALY. The cost-effectiveness of CAB-LA improves as its price decreases, becoming more advantageous than oral PrEP only after a 90% price reduction. **Conclusions:** Transitioning from oral PrEP to CAB-LA among eligible MSM is not cost-effective in China. While CAB-LA may not be affordable as a standalone strategy due to its high cost, it could serve as a complementary option to oral PrEP. CAB-LA's resilience to adherence and risk compensation issues makes it a critical tool in comprehensive HIV prevention strategies. Our study offers valuable insights into the market pricing of CAB-LA in China and provides relevant health economic data for policymakers. **Keywords:** HIV, Long-acting injectable cabotegravir, Cost-effectiveness analysis, China, Mathematical model.

Ind-820 Cost-effectiveness and Budget Impact of Clinic-based HIV Diagnosis and Viral Load Testing to Prevent Mother to Child Transmission in Papua New Guinea

PRESENTER: **Sophy Ting-Fang Shih**, University of New South Wales

AUTHORS: Quang Nguyen, Gillian Scott, Angela Kelly-Hanku, Janet Gare, Simon Pekon, Adam Bartlett, Roselyn Siki, Melissa Schulz, Richard T Gray

Background:

To address low coverage of HIV viral load (VL) testing and delays in infant diagnosis in Papua New Guinea (PNG), ACTUP-PNG was established to accelerate the uptake of point-of-care (POC) HIV VL testing and infant diagnosis. The aim of this study was to estimate the healthcare resources required to implement clinic-based POC testing and cost-effectiveness of potential interventions to reduce HIV transmission from mothers to children in PNG.

Methods:

A micro-costing was conducted using procurement and financial information from the project to estimate costs of clinic-based testing implementation. Time and motion data were also collected by purpose-designed tools to estimate staff time costs of testing. A decision analysis combined with Markov simulations, for infants who were exposed to HIV infection up to 5 years old, was undertaken to evaluate the cost-effectiveness of potential interventions compared to the status quo scenario in PNG. Incremental cost-effectiveness ratios (ICER) were reported by costs per disability-adjusted life-years (DALYs) averted. A budget impact analysis was undertaken from the funders' perspective to assess affordability of scaling up clinic based POC HIV testing in pregnant women and infants. Costs were estimated in 2022 US dollar (US$) and PNG kina (K).

Results:

Costs included fixed costs for training, transportation, quality control, overheads, and variable costs of consumables and cartridges. The costs per test were estimated as: US$45 (PGK166) for VL testing using GeneXpert; US$46 (PGK169) for VL testing in children (age <10) using m-PIMA; US$37 (PGK135) for infant diagnosis using GeneXpert. On average, one patient visit took 2.2 hours and an average labour cost of US$15 (PGK42) were estimated from 299 people with HIV.

Most interventions aimed at increasing coverage of HIV-related services were either cost-saving or cost-effective compared to status quo, judged by the threshold of US$ 4,119 per DALY averted (one GDP per capita in PNG). Expansion of infant prophylaxis coverage would be a dominant intervention, saving both lives and costs. Implementation of early infant diagnosis by POC testing and switching to new effective prophylaxis drugs would result in ICERs $348/DALY and $413/DALY averted, respectively. However, increasing access to antenatal care along or in combination with other single intervention was not cost effective (ICER ranges: US$5,793- US$14,524 per DALY averted).

In status quo with 36.7% maternal HIV testing, 67.5% prophylaxis coverage and no infant diagnosis within 6 weeks prior to the ACTUP-PNG

project, total annual cost of testing and treatment during pregnancy, prophylaxis at birth for at-risk infants, and infant diagnosis incurred US$2.3 million (K8.1 million). Increasing prophylaxis coverage to an achievable target (91.3%) would save US$4,629 (K16,295), while switching to new active prophylaxis would need additional annual budgets US$6,284 (K22,120). Increasing infant diagnostic POC testing by 50% would incur additional US$22,761 (K80,118).

Conclusion:

Given current high level of vertical HIV transmission in PNG, priorities should be given to increased coverage of infant prophylaxis and early infant diagnosis by POC testing. Adequate financial support is needed to reinforce PNG's laboratory capacity and workforce to ensure an ongoing strengthen HIV care in PNG.

Ind-1406 Comprehensive Analysis of Dengue Management and Costs in Emergency and Hospitalisation in One of a Tertiary Care Centres in Malaysia

PRESENTER: **Amirah Azzeri**
AUTHOR: Mohd Hafiz Jaafar

Dengue fever continues to be a significant public health concern in Malaysia, placing substantial clinical and financial demands on healthcare systems. This study provides a holistic examination of dengue presentations, case-mix indicators, and the associated costs at the emergency department (ED) and hospitalisations, with insights derived from the University Malaya Medical Centre (UMMC) in 2022. By integrating retrospective data, this research aims to inform healthcare policies, enhance clinical management, and optimize resource allocation in dengue-endemic regions. All the calculation was based on case-mix tariffs, which were derived through a comprehensive top-down costing exercise. In the ED setting, data from 1265 dengue patients were analysed based on ICD-10 codes (A97.0, A97.1, A97.2, A97.9 and Z11.5), revealing that these cases constituted 4% of total ED visits during the study period. The median patient age was 35 years, ranging from 0 to 95, with a nearly equal gender distribution (49.3% male and 50.7% female). A significant proportion of patients (55.4%) were discharged after initial treatment, while 36.7% required hospital admission. Despite the majority recovering, 2.2% succumbed to the disease. The economic analysis showed that the mean cost per dengue case was RM 212.37, contributing to a total ED expenditure of approximately RM 268,648.05. The case-mix indicators of 638 hospitalized dengue cases highlighted further complexities in resource utilization. Male patients slightly outnumbered females (52.5% vs. 47.5%), and most patients were admitted to the medical ward (87.6%), with others in the pediatric ward (7.2%). The median age of hospitalized patients was 41 years, with a median hospital stay of four days. Almost all patients were categorized as severity level 1 (99.4%), reflecting a high proportion of mild cases. The MyDRG code A-4-13-I was predominant among these admissions. The average cost of hospitalization was RM 1936.41 per patient, leading to an annual expenditure of RM 1,165,720.89 for dengue management in UMMC. In total, it was estimated that the hospital incurred RM 1, 434, 368.94 million (USD 320,674.31) for the management of dengue alone. These findings underscore the dual challenge of managing diverse clinical presentations and significant healthcare costs associated with dengue fever. At the ED level, early and accurate diagnosis is critical for efficient triaging and cost containment. In contrast, tertiary hospitals must optimize inpatient care strategies to address the substantial financial burden posed by prolonged hospital stays. The study highlights the importance of accurate case-mix coding and data integration across healthcare levels to capture the true burden of dengue comprehensively. By leveraging these insights, healthcare providers and policymakers can design targeted interventions to reduce morbidity, mortality, and economic strain associated with dengue. Emphasizing prevention, enhancing diagnostic accuracy, and implementing cost-effective clinical practices will be key in strengthening Malaysia's response to this persistent health challenge.

Ind-1621 Cost-Effectiveness of Seasonal Influenza Vaccination in Mongolia 2022/23: A Modeling Study

PRESENTER: **Tsogt Mend**
AUTHORS: Munkh-Erdene Luvsan, Urtnasan Chuluunbat, Gantsooj Baatar, Malembe Ebama, Burmaa Alexander, Oyungerel Darmaa, Baigalmaa Jantsansengee, Lindsey Hehman, Stacie Gobin

Background: Influenza is a major global health threat, causing substantial morbidity, mortality, and economic loss, particularly impacting high-risk groups such as healthcare workers, children, the elderly, and those with chronic conditions. Mongolia's population is especially vulnerable due to its harsh climate and nomadic lifestyle. With influenza's clear seasonal pattern and the country's recent transition to a fully sustained national vaccination program, the need for strong evidence on the cost-effectiveness of influenza vaccination is critical to guide policy and resource allocation. This study addresses the economic and health impact of seasonal influenza vaccination in Mongolia.

Methods:

The study employed a budget impact and cost-effectiveness analysis to evaluate the incremental cost-effectiveness of seasonal influenza vaccination compared to no vaccination. It focused on children aged 2-5 years, pregnant women, and adults aged 65 and above. Costs and benefits were discounted at a 3% annual rate, and outcomes were measured using Quality-Adjusted Life Years (QALY). The WHO CETSIV tool was used to model costs and effectiveness, following WHO guidelines. Data included disease burden, program costs, and health outcomes, with expert validation of inputs and assumptions.

Results:

The Study Year 3 (2022/23) analysis found high influenza-associated incidence rates in Mongolia, particularly affecting children under 5. The incidence rate for children under 1 year old was measured at 57.70% and 32.20% for children aged 1-5 years old. This estimated attack rate is more than three times the predicated attack rate for this age group based on a systematic review of vaccine randomized controlled trials (RCTs) that reported on laboratory-confirmed seasonal influenza. Out-of-pocket costs for inpatient and outpatient care increased, especially for children. Vaccination efforts showed 84.8% coverage in children, but were logistically expensive. The elderly saw a high coverage rate

(96.8%), while only 9.2% of pregnant women were vaccinated. Overall, influenza vaccination was cost-effective, with the ICER showing substantial cost savings and health benefits for high-risk groups.

The strategy of sending vaccination teams to schools results in high costs, averaging approximately 96,234.94 MTN per child. However, by shifting 85% of these vaccinations from schools to healthcare facilities, the cost per child could be significantly reduced. This approach would bring the cost down to 18,455.21 MNT per child, leading to a more cost-effective and efficient vaccination program, while still ensuring that children receive necessary immunizations.

Conclusion:

This study examines the challenges of vaccine reluctance and the economic burden of influenza in Mongolia, focusing on the period post-COVID-19. The economic analysis reveals that children under five incurred the highest healthcare costs, highlighting a substantial economic burden on families. A comparison across three survey years indicates rising out-of-pocket costs, particularly in rural areas, where the economic burden of influenza is most pronounced.

Recommendations include targeted educational campaigns to improve vaccine uptake, particularly among pregnant women and children under 2 years, and exploring more cost-effective strategies for vaccinating children.

Keywords Influenza vaccine, cost-effectiveness, Mongolia, health economics, vaccination policy

Ind-1834 Cost-Effectiveness and Budget Impact Analysis of TAK-003 for National Immunization Program in Indonesia

PRESENTER: **Jarir At Thobari**
AUTHORS: Hardini Tri Indarti, Welly Welly, Philip Towle, Sarah Maria Saragih

Background

Dengue presents a substantial public health burden in Indonesia. In 2017, an estimated 7.535 million dengue cases incurred approximately $681 million in costs. The TAK-003 dengue vaccine has shown sustained efficacy against symptomatic and severe dengue, yet its cost-effectiveness as a public health intervention in Indonesia remains unassessed. This study evaluates the cost-effectiveness over a 20-year time frame and budget impact over 5 and 10 years of a dengue vaccination strategy in Indonesia

Methods

We conducted a cost-effectiveness analysis using a static model with a dynamic component to assess the health and economic impact of TAK-003 vaccination from a payer and societal perspective. Indonesia-specific data, including demographics and costs, were used wherever possible to inform the model. Vaccine-related parameters, such as efficacy, were based on the DEN301 trial. The model evaluated a routine vaccination strategy for a 9-year-old cohort, with catch-up vaccinations for children aged 10- to 12-years, against a no-vaccination scenario over a 20-year timeframe. The primary outcome was the cost-effectiveness of the vaccination program, with benefits expressed as cost per disability-adjusted life year (DALY) averted. Sensitivity analyses, with 1,000 iterations, assessed result robustness. Additionally, budget impact analysis examined financial implications at 5-year and 10-year, evaluating costs for an initial catch-up vaccination followed by routine vaccinations for the 9-year-old cohort.

Results

TAK-003 vaccination substantially reduced dengue infections and hospitalizations. The cost per DALY averted is dominant over no vaccination. Over a 20-year horizon, it is expected to prevent approximately 47.9 million infections and 3.3 million hospitalization cases. At an illustrative price of $25/dose, the vaccination strategy shows very cost effective. Sensitivity analyses show that the ICER/DALY avoided is highly influenced by discount rate, probability of symptoms (given infection, and cost of vaccine acquisition per dose.

The budget impact analysis shows that the vaccination strategy generates significant cost savings over time. From the payer perspective, savings in medical costs exceed vaccination costs by $96 million in year 10. Meanwhile, from the societal perspective, savings in medical costs, productivity losses, and school absenteeism outweigh vaccination costs by $356 million in year 5 and $2 billion in year 10.

Conclusion

Vaccination with TAK-003 offers considerable reductions in dengue infections and hospitalizations, delivering significant public health benefits and cost savings. These findings support the implementation of TAK-003 within Indonesia's national immunization program, underscoring its economic viability from both societal and payer perspectives. The adoption of TAK-003 represents an impactful strategy for dengue control in Indonesia, with the potential to reduce incidence, hospitalization, and outbreak impacts.

Ind-1949 A Customisable Tool for Efficient Priority-Setting: Optimising Seasonal Malaria Chemoprevention Across Heterogeneous Contexts

PRESENTER: **David Bath**, London School of Hygiene & Tropical Medicine
AUTHORS: Halimatou Diawara, Bienvenu Camara, Eric Adehosi, Seydou Traore, Ibrahim Diarra, Lamine Mahaman Moustapha, Ibrahim Alkassoum, Issaka Sagara, Alassane Dicko, Jonas Loua, Alioune Camara, Abou Yahaya, Hadiza Jackou, Moriba Haba, Chrestien Yemeni, Suzanne Van Hulle, Joel Sodjinou, Agamaraki Adamou, Kano Assane, Paul Snell, Germaine Ekoyol, Jean Louis Ndiaye, Andre-Marie Tchouatieu, Catherine Pitt, Paul Milligan

Background: Seasonal malaria chemoprevention (SMC) involves the prophylactic administration of antimalarials to children at monthly intervals during the peak of each malaria season. In areas of seasonal transmission, 4 SMC cycles to children under 5 years has been shown to be effective and cost-effective, and is now delivered at scale in 17 African countries, reaching 49 million children in 2022. In many SMC areas, the peak malaria season is longer than 4 months, and there is evidence that a fifth SMC cycle may be cost-effective. Similarly, 3 cycles may be cost-effective in areas with a shorter season. However, national malaria control programmes (NMCPs) lack practical guidance on the optimal number and timing of cycles across areas of heterogenous transmission and seasonality. Our priority-setting tool, customisable to the country context, aims to identify the expansion pathway for SMC strategies in individual areas, rank all possible strategies, and select the combination of strategies that maximises total health impact for a given budget. In this presentation we describe our overall framework, and modelled findings for an example country, Guinea.

Methods: We estimated the cost, effectiveness, and cost-effectiveness of different SMC strategies (3-6 cycle lengths) in individual sub-national areas for Guinea. Areas were defined at the district level and grouped into operational units in consultation with the NMCP. The effectiveness of each strategy was estimated based on district-level data on SMC coverage, malaria incidence, seasonality, and other data on SMC efficacy and malaria mortality. The optimal timing of each strategy was calculated to maximise effectiveness. Financial and economic costs were estimated for each strategy in each area, from a provider perspective, based on prospective data on SMC delivery collected in 2022 in 3 countries (including one district in Guinea) and other secondary cost data, applying assumptions relating to economies of scale. We evaluated each strategy's cost-effectiveness against all other strategies and the cost-effectiveness frontier for each area; all possible strategies were then ranked nationally from most to least cost-effective and progressively selected until the cumulative cost reached Guinea's SMC budget constraint. The impact of individual and combined parameter uncertainty was explored through deterministic and probabilistic sensitivity analyses.

Results: Model development is ongoing and will be completed in early 2025. We will present the cost per child of different SMC strategies (3-6 cycles) and how costs scale by population and SMC coverage. The effectiveness of strategies in reducing peak season malaria cases will be illustrated for areas of varying transmission and seasonality. We will also present the cost-effectiveness frontier for sample areas, and illustrate on a map of Guinea the most efficient combination of strategies for a given budget.

Conclusion: Updated WHO malaria guidelines recognise that SMC strategies must be adapted to local epidemiology, without specific guidance on which SMC strategies to deliver, where, and when. Our priority-setting tool provides evidence to assist NMCPs in choosing SMC strategies that maximise the health impact of scarce resources across heterogenous contexts. The tool can be customised to individual country settings and regularly updated using routinely-collected data.

Ind-2460 Cost-Effectiveness of Novel Latent Tuberculosis Infection Screening and Treatment Modalities in Zambia

PRESENTER: **Lawrence Mwenge**, ZAMBART
AUTHORS: Richard Mwape, Buumba Tapisha, Kwame Shanaube, Ab Schaap, Helen Ayles

Introduction: Tuberculosis (TB) remains a significant public health challenge in Zambia. Despite the effectiveness of current TB infection control approaches, limitations persist in accessibility, timeliness, and resource allocation. There has been immerging TB infection testing technologies, such the skin test (Cy-TB) and the TB-Feron FIA, to enhance early detection, effective treatment. The two novel latent TB infection (LTBI) screening modalities, the skin test (Cy-TB) and point-of-care Interferon-Gamma Release Assay (IGRA), specifically TB-Feron FIA, show promise. However, these benefits must be weighed against their costs and the overall effectiveness in reducing TB infection screening. This study evaluates the cost and cost-effectiveness of Cy-TB and TB-Feron FIA compared to existing strategies in Zambia. **Methods:** We are undertaking a prospective economic evaluation, following standard economic evaluation guidelines. Primary cost data has been collected from the provider's perspective, covering standard care, Cy-TB, TB-Feron FIA, and TB treatment costs. Effectiveness will be estimated using trial outcomes and literature, measured in disability-adjusted life years (DALYs). A cohort-based model will compare interventions to standard care, featuring a cost-utility analysis (CUA) to calculate the incremental cost-effectiveness ratio (ICER) and probabilistic analysis (PA) to assess cost-effectiveness likelihood. The CUA will estimate incremental cost per DALY averted. **Results:** Costing data collection has been completed and data analysis is underway. Cost-utility will be completed during a decision modelling workshop in May 2025. The study will generate costs and incremental cost-effectiveness ratios of the interventions in terms of incremental cost per disability adjusted life-year averted. The results will contribute to informing policy decision in implementing TB-control in Zambia and similar settings. Results will be compared to other studies in similar settings for validation. **Conclusion:** This study demonstrates the importance of understanding the cost-effectiveness of TB infection control in resource-constrained settings. Our findings will provide valuable insights for policymakers, healthcare providers, and stakeholders. The results will inform resource allocation decisions, ensuring efficient implementation of National TB-control programs. Cost-effectiveness analysis informs policymakers and funders, enabling prudent investment in healthcare to maximize health benefits with available resources.

Ind-2693 Cost Effectiveness of Prevention Strategies for Human Anthrax in Uganda: a Health Sector Perspective

PRESENTER: **Yasiini Nuwamanya**
AUTHORS: Paul Okello, Susan Waako

Background: Anthrax, an acute zoonotic illness caused by Bacillus anthracis affects up to 100,000 humans annually. The major forms include cutaneous, gastrointestinal and inhalational anthrax; 95% being cutaneous. The case-fatality rate varies by form, up to 90%. Human transmission occurs through ingestion or contact with meat or products from infected animals or inhaling spores. From 2017─October 2024, Uganda reported 26 laboratory-confirmed human anthrax outbreaks in 18 districts; all associated with eating or contact with meat from cattle that died unexpectedly. Key drivers of anthrax infections include lack of anthrax surveillance and vaccination program for livestock, and illicit meat trade. These outbreaks increase morbidity, mortality and health expenditure in addition to causing loss of income for government and individuals. Preventing anthrax in animals is crucial for human protection but no routine measures are currently in place. **Aim:** We aimed to

compare the cost-effectiveness of different prevention strategies for human anthrax infections in Uganda, and inform policy. **Strategy options and perspective:** We modelled four strategies. Status quo involves reactive livestock anthrax surveillance during outbreaks and no livestock vaccination program. The alternative strategies include establishing a routine livestock anthrax surveillance system, routine anthrax vaccination for cattle and a combination of both. **Methods:** We conducted a full economic evaluation using the health sector perspective. We used Markov modelling in Amua software with a cohort size of 5 million people in 18 affected districts. The health states included "Healthy", "Sick/ Recovered", "Death from Anthrax" and "Other causes", using a cycle length of 1 month over a time horizon of 5 years. We merged the sick and recovered states due to the short prognosis of human anthrax. We modelled the event pathways for outcomes for each state. The parameters included probabilities of exposure to *Bacillus anthracis*, developing anthrax, hospitalization, and death from anthrax or other causes. The outcomes included costs of treatment, outbreak investigation and response, vaccination and anthrax surveillance, and QALYs. We computed incremental cost-effectiveness ratios for cost-effectiveness. We awarded a utility of 1 for a Healthy state, 0.5 for "Sick/Recovered" and 0 for death. We discounted the outcomes at 3% using the net present value method. Our data sources included the Uganda database of anthrax outbreaks, Uganda Bureau of Statistics, WHO life-tables and expert opinions. **Results:** Both routine anthrax surveillance (ICER=237 USD/ QALY) and vaccination (ICER=637 USD/QALY) were cost-effective: ICERs were below Uganda's per-capita GDP of 1,142 USD. However, the vaccination strategy was more effective, gaining 2,300 more QALYs compared to surveillance. A combination of both strategies was the most effective but not cost-effective (ICER=8,035 USD/QALY); larger than 7 times the Uganda's per-capita GDP. Sensitivity analysis revealed that our alternative strategies were sensitive to the incidence of anthrax, effectiveness of the surveillance system and prevalence of consumption of meat from cattle that died unexpectedly. **Next steps:** We intend to collect more data on the incidence of anthrax, consumption of meat from cattle that die unexpectedly and the anthrax surveillance system. Upon completion of the decision modelling, we will write a policy brief for dissemination to stakeholders.

Ind-87 Attributable Societal Cost of Antimicrobial Resistance in Ghana. A Microsimulation Study

PRESENTER: **Evans Otieku**
AUTHORS: Ama Fenny, Appiah-Koran Labi, Monica Jejeti, George Kwesi Hedidor, Robert Ofori Amoah, Ulrika Enemark

Background: There is a global consensus that the mounting public health threat attributable to antimicrobial resistance (AMR) requires investment case studies to persuasively galvanise national governments and other stakeholder interests and resources to implement National Action Plans (NAP) to mitigate AMR. Therefore, we performed a microsimulation analysis predicting the potential societal cost savings for AMR mitigation in Ghana. **Methods:** We combined AMR epidemiology data from the World Health Organisation's (WHO) Global Antimicrobial Surveillance System surveys in Ghana with micro-cost data attributable to AMR to perform a microsimulation analysis focusing on equity groups, predicting the potential societal cost savings should AMR be mitigated in Ghana. Costs were calculated under a business-as-usual scenario considering a seven-year time horizon from 2024 to 2030 and reported in purchasing power parity equivalent in international United States dollars, adjusting for dominant AMR causative pathogens, mortality, age groups, gender, and wealth quintile. **Results:** We predicted almost 78,000 annual AMR infections and 6,300 attributable deaths. MRSA and third-generation cephalosporin-resistant bacteria accounted for 20.2% and 79.2% of the predicted yearly infections, corresponding to an estimated mean societal cost of about USD 435 million. In decreasing order of magnitude, the estimated cost of productivity loss due to AMR-attributable mortality amounts to 40.6% of the annual cost, followed by the cost to healthcare providers 24.1%, direct medical cost to patients and caregivers 22.4%, productivity loss for surviving patients and caregivers 10.4%, and direct non-medical costs to patients and caregivers 10.4%. Resistant infections in children under five years and persons above 60 years contribute to 48.2% and 26.9% of the estimated annual societal cost, respectively. There was no statistically significant gender difference in the predicted number of resistant infections and costs. Except for the predicted number of resistant infections, the estimated mean annual costs between wealth quintile groups were significantly different (p=0.03) due to differences in productivity costs between wealth quintile groups. **Conclusion.** The study shows that everyone is at risk of AMR infection, and the attributable societal cost implications are enormous and avoidable. Given Ghana's NAP budget of about USD 21.3 million, the returns on investment in AMR mitigation will outweigh the cost should the government and other stakeholders invest in AMR interventions.

10:30 AM –12:00 PM TUESDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Denpasar B

Equity in Demand for and Access to Health Services Among Older Adults

MODERATOR: **Febriansyah Budi Pratama**,

Ind-980 Housing Price as a Determining Factor of Aged Care Accommodation Payment Choices

PRESENTER: **Henry Cutler**, Macquarie University
AUTHORS: Dandan Yu, Mona Aghdaee, Anam Bilgrami, Yuanyuan Gu

Background: As the ageing population continues to grow, the demand for residential care services has surged in many countries. Governments have responded by implementing targeted policies to support the most disadvantaged populations, while increasingly placing the burden of financing residential aged care on individual consumers. In Australia, residential aged care consumers who are ineligible for government subsidies choose from three accommodation payment options: up-front lump sum payments that are refundable to the resident on leaving the facility (known as refundable accommodation deposits), rental-style daily accommodation payments, or a combination of the two. Since home equity constitutes a substantial portion of net wealth for most elderly people, affording a lump-sum payment for residential aged care accommodation often necessitates downsizing their homes through financial instruments or property sales. **Aims**: Given that local real estate market conditions affect consumers' ability and willingness to withdraw home equity, our study examines how housing price fluctuations shape their accommodation payment choices and contributes to the limited body of research on the factors influencing these decisions. **Methods**: We

utilise an administrative dataset collected by the Aged Care Financing Authority of Australia, which contains information on the characteristics of residential aged care facilities and consumers, as well as their accommodation payment choices from 2016-17 to 2018-19. This dataset is merged with housing price indices, calculated from CoreLogic RP data for each postcode area, based on the consumers' place of residence. Multinomial and fractional logistic regressions are employed to model the payment choice. **Results**: In areas with larger housing price increases, residential aged care consumers are more likely to choose the up-front lump sum payment and less likely to opt for daily payments or the combination. An increase in housing price changes also raises the proportion of the lump sum payment in the total accommodation price. These results are robust to alternative housing price indices, adjustments for potential measurement errors, and various modelling strategies. A placebo test on consumers who are unlikely to own property reveals no significant effect of housing price changes, indicating that the observed relationship is not driven by other confounding factors. We also find that married consumers' payment choices are less influenced by housing price fluctuations. When housing prices rise rapidly, the impact of these increases on the likelihood of choosing lump sum payments diminishes. This may be because some consumers view their property as an investment and prefer to pay daily accommodation fees using returns from property appreciation. **Conclusions**: Payment choices for residential aged care profoundly impact the financial well-being of elderly individuals. This study highlights the role of housing equity as a buffer against adverse shocks in later life and reveals that residential aged care providers are vulnerable to the risks associated with real estate market fluctuations, particularly those relying on lump sum payments as interest-free loans to fund capital investments. These insights offer invaluable support for residential aged care providers in refining their financial planning strategies.

Ind-1017 Residents Preferences for Osteoporosis Community Intervention: an Empirical Analysis from Shanghai, China

PRESENTER: **Yijia Feng**
AUTHOR: Luying Zhang

Background： Osteoporosis is a chronic disease that requires long-term treatment and management. Results of the *First National Epidemiological Survey on Osteoporosis* in 2018 showed that the prevalence of osteoporosis among people over 50 years of old in China was as high as 19.2%, resulting in a great economic burden of disease. Early community intervention has been proved to be an effective means of control in osteoporosis. However, residents' preferences of osteoporosis community intervention remain underexplored in China. This study aims to investigate the preferences of osteoporosis community intervention in China. **Methods:** A discrete choice experiment was conducted in 6 communities in Shanghai to elicit population's preferences for osteoporosis community intervention. We constructed a mixed logit model including a total of 14 levels of 6 attributes including access to screening information, screening duration, service supplier, mode of administration, management approach and out-of-pocket (OOP) costs. Willingness-to-pay (WTP) and scenario prediction were also calculated to further complete the preferences results. Subgroup analyses were performed mainly according to respondents' age, income, geographic location and whether already have osteoporosis. **Results:** A total of 170 valid questionnaires were collected through face-to-face interviews from 6 communities in Shanghai. We found that OOP costs was the most concerned factor, followed by screening duration, service supplier and access to screening information. Subgroup analyses revealed that screening duration and service supplier showed a greater impact on respondents' utility in the suburban samples compared to those resided in urban communities. This may be due to the lower accessibility of screening services and community GPs in suburbs. Scenario prediction results provided further evidence that when optimizing community intervention programs for osteoporosis, the combination of short screening duration, service supplied by specialists from tertiary hospitals and management supplied by GPs made more significantly positive contributions to improving residents' total utilities. **Conclusions:** This study provided valuable insights into population's preferences for osteoporosis community intervention in China. Acknowledging the impact of attributes in community intervention strategies on residents' utilities and their WTP means a lot to optimize community interventions.

Ind-1234 Effects of Cost-Sharing on Utilization, Expenditure, and Health Outcomes Among the Elderly in City A, China: A Regression Discontinuity Analysis

PRESENTER: **Zixuan Fu**
AUTHOR: Yanming Lin

Background: Rising healthcare costs, driven by an aging population and increasing insurance generosity, pose significant challenges to the financial sustainability of health insurance systems. While increasing patient cost-sharing is a potential strategy to control expenditures, it involves trade-offs, such as reducing healthcare overuse while risking reduced access to necessary care and undermining financial protection. Further research is needed to understand the impact of cost-sharing change on utilization, health outcomes, and risk protection, particularly for the elderly. **Method:** Using discharge data from two tertiary hospitals in City A, northern China (2013–2018), which accounted for 35.6% of all inpatient admissions in the city's tertiary hospitals during this period, we analyzed 108,127 discharged cases of patients aged 65–75 enrolled in the Urban Employee Basic Medical Insurance (UEBMI). In City A, the deductible for hospitalization under UEBMI decreases sharply at age 70, reducing out-of-pocket expenses by approximately 10%. Exploiting this discontinuity, we employed a regression discontinuity design to estimate the effects of reduced cost-sharing on healthcare utilization, expenditures, and mortality. **Results:** The deductible reduction at age 70 led to a 10.0% increase in inpatient admissions, with higher increases in surgical (10.7%) than non-surgical (8.4%) admissions. Elective surgeries, such as cataract surgeries (15.9%) and joint replacement (24.0%), experienced larger growth, suggesting patients may delay elective procedures to benefit from lower cost-sharing. The reduction in deductible had no significant effect on hospital length of stay. Total healthcare expenditures per admission decreased by 1.6%, primarily due to a 1.5% reduction among non-surgical patients, while no statistically significant changes were observed for surgical patients. Out-of-pocket expenditures per admission declined by 12.3%, with reductions of 13.2% for non-surgical patients and 5.8% for surgical patients. The proportion of out-of-pocket expenses in total medical expenditures decreased by 1.8%, including declines of 1.9% for non-surgical and 1.4% for surgical patients. Changes in reimbursement were statistically insignificant across all patient groups, including both surgical and non-surgical patients. Mortality estimates showed no statistically significant changes across all patient groups, indicating that reduced cost-sharing had no measurable effect on health outcomes, at least in the short run. **Conclusion:** Lowering the deductible at age 70 significantly increases healthcare utilization, particularly for elective surgeries, while improving financial

risk protection through reduced out-of-pocket expenses. Notably, the reduction does not negatively impact health outcomes or contribute to excessive growth in healthcare expenditures. These findings indicate that moderate reductions in cost-sharing for elderly individuals with substantial healthcare needs and higher medical expenses can effectively balance increased utilization and enhanced financial protection without undermining the sustainability of the health insurance system. 21

Ind-1854 National Insurance Claims Data to Assess Adult Vaccine Access in Herpes Zoster in Indonesia

PRESENTER: **Labbaika Nurmadani**
AUTHORS: Hasbullah Thabrany, Yufan Puteri Astrini, Mutia Anggun Sayekti, Rifqi Abdul Fattah

Approaching the era of an aging society, Indonesia will face increasing health risks including the weaken immunity that is likely lead to rising healthcare costs. Prevention plays an essential in ensure the aging population lives healthily while preventing excessive healthcare costs due to unaddressed illness. Immunization as the pivotal preventive approach is regulated under Health Ministerial Decree 12/2017, highlighting the focus on childhood immunization, with limited coverage on adults and the elderly immunization. This inequity neglects the risk of vaccine-preventable diseases on adult and elderly population that may significantly hamper the health system, such as Herpes zoster. Herpes Zoster is caused by the reactivation of the Varicella Zoster Virus (VZV), the same virus responsible for chickenpox. This disease can lead to severe pain that disrupts daily activities and may also result in Postherpetic Neuralgia (PHN), causing prolonged pain lasting months or even years. According to the Centers for Disease Control and Prevention (CDC), the incidence of Herpes Zoster in the United States ranges from 2 to 9 cases per 1,000 people, with an estimated 96 deaths annually and a mortality rate of 0.28–0.69 per 1 million population. The risk of morbidity and mortality from Herpes Zoster increases with age and decreased immune system. In addition to adults, immunocompromised also have a high risk of developing this disease. Understanding the importance in expanding the access to adult vaccines, particularly for Herpes Zoster, local data is essential to demonstrate the burden of Herpes Zoster in Indonesia. This study aims to determine the disease rate and associated demographic characteristics of Herpes Zoster cases as a foundation for informed policymaking.

Applying quantitative methods to analyse one percent of JKN claims data from 2015 – 2022 in obtaining the results, we further used ICD codes in primary and secondary diagnoses related to Herpes Zoster (code group B02). The analysis revealed that 7 per 10,000 National Health Insurance participants were affected by Herpes Zoster between 2015 and 2021. The disease was more prevalent among females (54%) compared to males (46%) and was most common in the 61–70 age group. Additionally, Herpes Zoster was more frequent in immunocompromised groups, such as those with HIV/AIDS, autoimmune disorders, and cancer, compared to individuals with other risk factors like diabetes, heart disease, and chronic respiratory diseases. The total cost of treatment amounted to IDR15.3 billion (USD975,259) for inpatient care and IDR7.3 billion (USD465,319) for outpatient care.

Expanding the access to the Herpes Zoster vaccine will require collaborative and continuous efforts, specifically in increasing awareness and education within at-risk populations about the vaccine's significance as well as improving the knowledge and skills of healthcare professionals. Collaborative efforts between the public and private sectors are essential for ensuring the availability of the vaccine to vulnerable groups, alongside the development of a sustainable public funding plan to support Herpes Zoster vaccination programs. Vaccination against this disease can significantly reduce both the economic burden on individuals and healthcare systems, while promoting the health and productivity of the adult and elderly populations.

Ind-1972 Pensions as a Pathway to Protection: Enhancing Vaccine Uptake in Aging Populations

PRESENTER: **Reshmi Sengupta**
AUTHOR: Debasis Rooj

India’s rapidly growing aging population presents significant challenges for public health, particularly in preventing illnesses among older adults through timely immunization. Despite the increasing burden of vaccine-preventable diseases, adult vaccination rates in India are worryingly low. This paper examines whether access to work-related pensions, a key source of income security in later life, can encourage older adults in India to seek preventive healthcare, particularly immunization. Using nationally representative data from LASI Wave 1 and focusing on individuals aged 60 and older, we apply a copula-based bivariate regression model to estimate the joint receipt of pensions and outpatient visits for immunization. This method addresses significant econometric issues, including endogeneity, nonlinear covariate effects, and rare-event bias resulting from low vaccination rates. We find that receiving or expecting a contributory pension greatly increases the likelihood of recent outpatient visits for immunization. Pensions also appear to increase awareness of senior benefits, reduce food insecurity, and enhance media exposure, suggesting both financial and informational avenues that encourage preventive health actions. The findings are consistent across various model specifications and instrumental variable analyses. By demonstrating the positive impact of pensions on health behavior, this study provides new evidence on how formal social support can help promote healthy aging. Our results underscore the need to expand contributory pension coverage, particularly for underserved groups, as a cost-effective means to enhance public health and mitigate future healthcare demands in aging societies. This has broader implications for policy development in other low- and middle-income countries experiencing similar demographic shifts.

Ind-2794 How Do Socioeconomic Inequalities Affect Health Outcomes in Healthcare Utilization Among Middle-Aged and Older Migrants in India?

PRESENTER: **Suraj Maiti**
AUTHORS: Reshmi R. S., Amar Bharti

Background

Migration and population aging are significant demographic forces impacting global health outcomes and economic stability. As of 2017, the global aging population was 962 million, with projections suggesting this number will double by 2050. In India, the internal migrant population increased from 309 million in 2001 to approximately 600 million by 2021. Migrants in India often face economic vulnerabilities, including

inadequate wages and poor working conditions, which exacerbate their health issues and limit access to healthcare services. The National Health Policy (NHP) 2002 aimed to improve equitable access to healthcare across India. Despite these efforts, disparities in healthcare utilization persist, particularly among middle-aged and older migrants. We aimed to explore whether inequalities in socio-economic factors influence healthcare utilization and outcomes among this demographic, focusing on the inequities in accessing inpatient and outpatient services.

Methods

We utilize data from the Longitudinal Ageing Study of India (LASI) (2017-18). The complete case analytical sample included 36,595 migrants identified based on their place of birth and continuous residence. The Anderson conceptual framework guided the choice of healthcare utilization determinants, categorizing explanatory variables into predisposing factors (age, sex, marital status, education, social group, residence), enabling factors (monthly per-capita household consumption expenditure [MPCE], working status, health insurance), and need factors (limitations in activities of daily living [ADL], self-rated health [SRH], morbidities). Descriptive statistics, bivariate analysis, and hierarchical nested logistic regression were used. Concentration curves and the Erreygers concentration index assessed socio-economic inequalities in healthcare utilization.

Findings

We found that 58.7% (95% CI: 56.3%, 61.1%) of migrants utilized outpatient care, while only 7.3% (95% CI: 6.6%, 8.2%) accessed inpatient care. Significant associations were observed between healthcare utilization and factors such as age, region, MPCE quintiles, working status, limitations in ADL/IADL, morbidity presence, and SRH. Migrants with poor SRH were 2.17 times more likely to use inpatient care compared to those with good SRH. Additionally, those with both non-communicable diseases (NCDs) and communicable diseases (CDs) were 3.45 times more likely to seek inpatient care than individuals without morbidity. The concentration indices for outpatient (0.049; 95% CI: 0.026, 0.073) and inpatient care (0.192; 95% CI: 0.131, 0.210) indicated a pro-rich inequality in healthcare utilization.

Conclusion

Significant socio-economic inequalities exist in healthcare utilization among middle-aged and older migrants in India. Predisposing, enabling, and need factors influence healthcare access for this vulnerable group. Implementing health insurance schemes for outpatient services will be crucial to improving healthcare utilization among elderly migrants. Developing micro-level policies that enhance access to healthcare at migrants' destinations is essential for addressing these disparities effectively.

Ind-2665 Living Alone? The Effect of Living Alone on Patient Length of Stay in Public and Private Hospitals

PRESENTER: **Jinglin Wen**
AUTHOR: Luigi Siciliani

Following the COVID-19 pandemic, hospitals are under pressure to absorb elective backlogs that have accumulated due to the suspension of health services. Reductions in length of stay can generate additional capacity to treat patients and increase efficiency. One non-clinical determinant of length of stay is whether the patient lives alone. Patients who live alone may lack support at home once discharged and the hospital may need to keep the patient longer despite being clinically fit for discharge. On the other hand, patients living alone could have other sources of support (e.g. family and friends) that mitigate such effects. The size of the effect of living alone on length of stay is in principle indeterminate. This study tests whether living alone affects length of stay of patients treated by public and private hospitals treating NHS patients requiring an elective hip replacement. Economic theory suggests that private providers have stronger incentives to contain costs, and this could translate into shorter length of stay and the extent to which non-clinical determinants, such as living alone are taken into account. We use administrative data from the Hospital Episode Statistics matched with Patient-Reported Outcome Measures Survey (PROMs) for four financial years before (2016/17-2019/20) and three years after COVID-19 (2020/21-2022/23). We conduct patient level linear regression models and control for a range of patient characteristics, such pre-operative health, age, ethnicity, comorbidities and past emergency admissions), hospital characteristics (through hospital fixed effects), and availability of local supply of care homes, rehabilitation and community care (through small area fixed effects). We further use (coarsened exact) matching to compare private and public hospitals.** We find that patients who live alone stay 0.23 days longer in private hospitals and 0.42 days in public hospitals in the pre-pandemic period, and 0.17 days in private hospitals and 0.39 days following the pandemic. After matching, the effect of living alone reduces in public hospitals to 0.36 days in the pre-pandemic period and 0.32 days following the pandemic. We also show that the effect of living alone is concentrated in the post-operative rather than the pre-operative length of stay. And that the effect is larger for male and older patients, and those living in rural areas.

abs-os254 Long-Term Care in Indonesia: Need, Use and Inequality in Use

PRESENTER: **Lotte Beeldman**
AUTHORS: Judith Bom, Ms. Igna Bonfrer, PhD, Job van Exel

Background: Many low- and middle-income countries now face rapid population aging, accompanied by an increasing number of older people requiring care due to age-related disabilities or chronic health conditions. However, few have sufficiently developed formal long-term care (LTC) systems to support their growing older populations. In many countries, including Indonesia, informal family care remains the predominant form of LTC available to older people. Due to urbanization, changes in family structures, and an increase in women's participation in the workforce, this form of care has recently come under rising pressure. Despite these shifts and the growing population of older people requiring care, research on the needs, utilization, and inequalities in LTC in Indonesia is limited. Currently, Indonesia has no public long-term care insurance, and LTC services are not included in the national "JKN" health insurance program.

This research aims to address critical gaps in understanding these dynamics, highlighting the necessity of a comprehensive and equitable

approach to LTC policy in Indonesia.

Methods: Data from the RAND Indonesian Family Life Survey (IFLS) 2014/2015 (wave 5) was used to estimate the need for, use of, and inequalities in the use of LTC in the Indonesian population aged 45 years and older. Indicators on activities of daily living (ADL) and instrumental activities of daily living (IADL) were used to assess the level of need for care services. Additionally, a distinction was made between the receipt of informal (unpaid) care and formal (paid) care. Using data on need, receipt of care, and socioeconomic indicators, income inequality in the use of and intensity (hours per month) of informal LTC was estimated using a concentration index.

Results: Approximately 22% of the population aged 45 years and older has at least one limitation in either ADL or IADL, indicating some need for LTC. Almost 72% of people with such needs receive some form of care, with most of this care being informal. Only 4% of people with needs receive paid or formal care. There is a clear pro-poor distribution of need for care within the population (CI = -0.067). While there is no income inequality in the distribution of receiving any care when in need, the intensity of care is distributed pro-rich (CI = 0.073).

Conclusion: Older people in Indonesia rely predominantly on informal care services, with minimal use of formal LTC. This reliance may be due to the unavailability of formal services, unaffordability due to the lack of insurance, or personal preferences for family care. Additionally, there is a clear pro-rich distribution of the intensity of care received, leading to socioeconomic inequalities. Considering current societal changes in Indonesia, such as urbanization and shifting family structures, the heavy reliance on informal LTC is likely to become unsustainable in the near future. To prevent unmet needs and inequalities within its aging population, the Indonesian government should reconsider its LTC policies and explore the implementation of a long-term care insurance system to facilitate the expansion of an affordable formal LTC infrastructure.

10:30 AM –12:00 PM TUESDAY [Health Care Financing & Expenditures]

Bali International Convention Centre – Nusantara 1

Healthcare Affordability Challenges

MODERATOR: **Lan Yao**,

Ind-1396 Catastrophic Health Expenditures and Medical Impoverishment in Bangladesh

PRESENTER: **Abdur Razzaque Sarker**

Introduction: In the South-East Asia Region (SEAR), Out-of-Pocket (OOP) healthcare expenditure, hereafter referred to as OOP expenditure for short, is the main source of healthcare funding. It was observed that more than half of the SEAR countries including Bangladesh spent more than one-third of their current health spending on household OOP expenses. Bangladesh uses a combination of general revenue taxation, out-of-pocket payments, donations from development partners' contributions for healthcare financing strategies. Indeed, (OOP expenditure is one of the most noteworthy payment strategies for healthcare in Bangladesh and the share of OOP expenditure has been increasing alarmingly from 55.9% in 1997 to 68.5% in 2020 according to the Bangladesh National Health Account which was about 73% in 2021 according to the Global Health Expenditure dataset. This study aimed to investigate the impact of OOP expenditure on CHE and impoverishment in Bangladesh and identify their determinants. Findings from this study may have implications for setting future healthcare policy priorities for achieving UHC in Bangladesh, and may provide lessons for other countries in the South- Asian region. **Methods:** We used data from the latest Household Income and Expenditure Survey 2022 (HIES-2022) carried out by the Bangladesh Bureau of Statistics, with a sample of 14,395 households. The well-known methodology developed by Wagstaff and Doorslaer was used in this study to estimate the incidence of catastrophic health expenditure (CHE) and impoverishment effect of catastrophic health spending. We used the generalized linear model (GLM) with a log link and gamma distribution to assess the associations between the explanatory variables and annual OOP cost. Multilevel logistic models were employed to identify the determinants of CHE and impoverishment. **Results:** The incidence of CHE was estimated at 17.72% and 7.07% using 10% and 25% of the total consumption expenditure as thresholds, respectively. Given the 40% of non-food expenditure threshold level, about 9.46% of households faced CHE due to OOP costs in Bangladesh. About 3.7% of the population (6.13 million) fell into poverty during 2022 in Bangladesh. The incidence of CHE was higher among male-headed households, larger households, households with older people, those with chronic illnesses, those utilizing hospital care, and people in the poorest wealth quintiles. These were the main determinants of both CHE and impoverishment. **Conclusions:** The financial hardship due to OOP expenditure was high in Bangladesh. Therefore, people with such characteristics should be brought under pre-payment schemes such as social health insurance. These results will also enable policymakers to adopt various healthcare financing strategies and improve the efficiency of public investments in health.

Ind-865 Which Diseases Drive Catastrophic Payments of Households? Results from a National Expenditure Survey

PRESENTER: **Aleli Kraft**

AUTHORS: Owen O'donnell, Joseph Capuno, Kayleen Calicdan

Background Indicators for SDG 3.8 (Achieve Universal Health Coverage) include an index of service coverage and catastrophic spending – the proportion of medical expenditures that exceed 10% or 25% of total household expenditure. Reducing out-of-pocket spending (OOP) for health is vital to reducing catastrophic health spending. Most past studies of OOP, including those in the Philippines, have utilized national household expenditure surveys that do not have details on conditions that contribute to OOP. Sources of OOP have been described in terms of main sources; i.e., outpatient or inpatient care, and medicines. Thus, our study seeks to answer the following questions; (a) which diseases contribute to the OOP of households, and (b) which diseases are likely to cause household catastrophic payments. Methods We use data from the

Philippine National Health Expenditure Survey, a nationally representative health survey collected between November 2018-May 2019 that seeks to complement the National Health Accounts and collect data not covered by DHS surveys and other household expenditure surveys. We use information from 11,014 households and associated 15,055 healthcare visits. We estimate OOP as the sum of the charges paid for using (1) own household resources, savings and income, (2) sale of property, and (3) personal loans. We exclude transfers from charities, local government units (LGUs) and reimbursements from health insurance. We include charges from outpatient (OP) visits, medications and medical equipment and supplies in the last 6 months, and inpatient visits (IP) in the last 12 months. Disease categories are represented by ICD-10 codes for OP and IP visits which are the bases for the construction of a binary variable that is equal to one if any member of the family had an OP or IP visit due to the specific disease. We estimate Poisson models for OOP for all households and those with positive OOP. We estimate probit models on the likelihood of catastrophic spending at the 10% and 25% thresholds. We control for household size and composition, household head characteristics, per capita monthly non-medical expenditure quintiles, and location. Results Respiratory conditions and cardiovascular diseases account for the highest causes of household visits to health facilities. Households that have members who had neoplasms, diseases of the genito-urinary system and endocrine and metabolic disorders have the highest contributions to OOP. These also increase the likelihood that households will incur catastrophic spending. On the other hand, cardiovascular diseases, respiratory diseases and endocrine and metabolic disorders contribute to higher predicted overall prevalence of catastrophic health spending. Discussion There are differences between diseases that contribute most to household OOP and those that contribute to the overall prevalence of catastrophic spending. If the objective is to improve financial risk protection at the household level, then benefits could target diseases which contribute most to household OPP. If the objective is to reduce the prevalence of catastrophic spending at the aggregate level, then benefits can target diseases which not only contribute to OOP but have high population prevalence as well.

Ind-1678 Trends in the Incidence and Intensity of Catastrophic Health Expenditure in Urban and Rural China: 2010-2022

PRESENTER: **Yaping Deng**
AUTHORS: Jingxian Wu, Cong Li

Background Catastrophic health expenditures (CHE) occur when out-of-pocket (OOP) healthcare payments exceed a predetermined threshold, imposing financial hardship and increasing poverty risk. This study aims to examine the trends in the incidence and intensity of CHE among urban and rural households in China from 2010 to 2022and explore the associated factors influencing CHE occurrence. **Methods** Data were obtained from the China Family Panel Studies (CFPS), a national representative household survey conducted biennially from 2010 to 2022. CHE was defined as OOP healthcare payments exceeding 10% of total household expenditures or 40% of non-food expenditures. Incidence was measured by the headcount ratio (percentage of households experiencing CHE), while intensity was assess using overshoot (extent to which OOP payments exceed the threshold among all households) and mean positive overshoot (MPO, extent to which OOP expenditures exceed the threshold among affected households). A random-effects logit model was applied to identify factors associated with CHE occurrence. **Results** From 2010 to 2022, the incidence and intensity of CHE declined significantly in both urban and rural households, with sharper reductions observed in rural areas. Using the 40% threshold, the incidence of CHE dropped from 33.8% to 11.2% in rural households (annual decline rate: 1.89%) and from 17.1% to 8.9% in urban households (annual decline rate: 0.68%). Intensity, as measured by overshoot, decreased from 13.4% to 2.5% in rural households and from 4.8% to 2.0% in urban households. MPO declined from 24.4% to 9.2% in rural areas and from 12.3% to 8.9% in urban areas. Similar trends were observed using the 10% threshold. The random-effects logit model revealed consistent patterns across thresholds. Factors associated with a lower likelihood of CHE occurrence included higher education (particularly university or above) and stable employment of household heads, and enrollment of family members in commercial health insurance, while social health insurance coverage had limited impact. Conversely, inpatient care utilization was the most significant driver of CHE, followed by older household heads and poorer self-rated health among family members. Rural households were more vulnerable to CHE when chronic illness or children under five years were present, whereas the presence of older adults was more strongly associated with an increased likelihood of CHE in urban households. **Conclusion** This study demonstrates significant reductions in the incidence and intensity of CHE in China over the past decade, particularly in rural areas. However, persistent disparities remain for households burdened by inpatient care costs, chronic illnesses, or specific demographic vulnerabilities. Policy reforms should prioritize reducing inpatient OOP expenses, especially for high-cost services, while expanding insurance coverage and targeted subsidies for rural households with chronic illnesses or young children. Simultaneously, enhanced support for urban households with older adults is essential to further mitigate CHE risk and promote greater equity in health financing under Universal Health Coverage.

This study is funded by the National Natural Science Foundation of China (No. 72104196).

Ind-721 Hard Life, Hard choices: How Out-of-Pocket Payments Affect Households' Consumptions and Savings Trade-offs

PRESENTER: **Antoine Marsaudon**
AUTHORS: Paul Dourgnon, Renaud Legal, Damien Bricard

Context

Out of Pocket payments (OOP) are the medical care expenses that are not reimbursed by insurance. These include deductibles, coinsurance, copayments for covered services, and costs for services which remain not covered. Households facing costly treatments, poor healthcare coverage are likely to bare high OOP. While former research addressed the prevalence, distribution and economic consequences of “catastrophic OOP” or “surprise payments”, little is known on the impact of heath shocks and related increase in OOP on non-medical consumptions and savings.

OOP may affect households through an income effect and a preferences effect. When facing an increase in OOP following a health shock,

households may reduce their non-medical consumption, reduce their savings or their financial assets, receive financial transfers from relatives or borrow money. Beside the above income effects, households demand for non-medical goods may also change if the marginal utility of non-medical consumption was dependent of health status. Individuals may less value non-medical consumptions complemental to good health (such as travels or sports), and more those that are substitutable to good health (such as home delivery or home assistance).

Objectives

A large literature has studied the impact of high OOP payments on households' financial situation (budget deficit, financial debts, personal bankruptcy) and on total consumption. Our study adds up to the literature by exploring whether households facing OOP payments are also undergoing changes in non-medical consumptions patterns and on savings.

Methods

We base our study on micro data from the pooled 2011 and 2017 French Household Budget cross-sectional Surveys, which collected medical and non-medical consumptions enriched with fiscal data. This survey enables to identify health shocks, defined as unexpected high health expenditure, and unmet health needs. Non-medical consumptions include housing, food, leisure, transport, clothing, communications, and education. We use linear models to estimate correlations between OOP and non-medical consumptions expenditures, controlling for households' characteristics, and potential unmet needs, i.e. the fact that households may cope with an OOP shock by reducing their health consumption.

Results

We show significant correlations between OOP and most non-medical consumptions, also with savings. We estimated the same models across expenditure quintiles, measured as percentage of household income, to account for nonlinear interactions. Models were also estimated across income quintiles in order to explore social variations in coping behaviors.

Conclusions

Out of pocket Payments represent a significant challenge for health systems equity, especially in systems where payments are based on fee for services and relying on cost sharing as a cost containment tool. Not only does it induce inequalities in access to healthcare services, but it also impacts financially poor and unhealthy individuals and households, and the consumption of other goods which may be considered important or essential.

Ind-1051 The Unaffordability of Affordable Care Act Health Insurance Plans

PRESENTER: **Cheryl Damberg**
AUTHOR: Risha Gidwani

Insurance is the gatekeeper through which most Americans access medical care. The 2010 passage of the Affordable Care Act (ACA) was heralded as a way to expand health insurance in an affordable manner to millions of Americans previously unable to afford such protection. The ACA offered Americans ineligible for public or employer-sponsored insurance an opportunity to directly purchase insurance, many of whom have received federal subsidies to enable them to afford coverage. ACA marketplace participants select from a wide array of private health plans. Complexity of choice is a significant contributor to poor health insurance selection, with literature showing that an increase in choice set can make decision-making more difficult. In the context of the ACA marketplace, this complexity can arise from the excessive number of health insurance plans combined with numerous cost, coverage, and provider network features that need to be jointly considered for each plan.

Given the critical importance of selecting appropriate health insurance for millions of Americans choosing ACA marketplace coverage, this study aimed to characterize the current landscape of health insurance plan choices on the ACA marketplace and the extent to which plans and plan selection remain in reach of the average consumer. We investigate the choice set facing millions of Americans and the affordability of available plans, with a particular focus on identifying the proportion of plans that are considered unaffordable.

Methods: We evaluated the affordability and selection of health plans on the ACA marketplace using 2023 HIX Compare data, which contains detailed benefit design information on 100% of ACA plans offered in the U.S and using the U.S. Census Bureau's Small Area Health Insurance Estimates to estimate the proportion of Americans eligible to purchase ACA insurance. Using modified Commonwealth Fund definitions, an ACA plan was considered unaffordable if the premium exceeded 10% of the median annual household income in the county. Median county-level annual household income was obtained from the American Community Survey Years 2018-2022, the most recent years available. We analyzed plan availability, premiums, and affordability across U.S. counties, evaluating disparities by race, ethnicity, and rurality.

Results: 97% of counties offer at least 25 plans, with 54% of the ACA-eligible population facing more than 150 options. Despite this variety, affordability remains a significant issue: 68% of Bronze plans are unaffordable for a 27-year-old individual, and 96.9% of all plans are unaffordable for a family with two adults. High premiums, coupled with poor health insurance literacy, particularly among racial minorities, exacerbate financial burdens and hinder access to care.

Conclusions/Policy Implications: The amount of choice ACA customers face is so large as to be overwhelming, underscoring the need for streamlined plan options to reduce complexity of choice. Further, the unaffordability of ACA-based insurance needs to be addressed to ensure equitable access to healthcare. Future policies to reduce the cost of ACA plan coverage and/or continued subsidies to purchase insurance may be needed to ensure access to care. Before accessing a single health care service, many ACA enrollees experience financial burden simply due high premium costs.

Ind-2239 Socio-Economic Inequalities in the Financial Burden of Diabetes: Evidence From Punjab

PRESENTER: **Sujata Sujata**
AUTHORS: Ramna Thakur, Martin Siegel

Background Diabetes is a rapidly growing global health crisis, with India holding the second-highest number of cases, and the burden is unevenly distributed across the country's different regions and socioeconomic groups. With a low insurance coverage rate, households face significant out-of-pocket healthcare expenditures (OOPHE), which account for 58.7% of the overall health expenditure. Hence, the primary objective of this study is to examine inequalities in the physical and financial burden of diabetes with respect to household and area-level factors in the Indian context. **Methods** We collected quantitative data on self-reported diabetes, OOPHE, and socio-economic variables from 4,418 households in different districts of the Indian state of Punjab. Socioeconomic inequalities in diabetes and OOPHE are measured using the concentration index, and the progressivity of OOPHE is analyzed using Kakwani index. The incidence of CHE is estimated using the budget share approach. We used an adapted two-part model to analyze variations in the probability of having diabetes and incurring OOPHE across various socio-economic groups. **Results** We found that diabetes and OOPHE are concentrated among the richest households. OOPHE was proportional to household consumption; however, in the subgroup of diabetics, the share of OOPHE in households' monthly per capita consumption expenditure (HMPCE) is highest for the poorest, followed by middle quintile. Across different deprivation groups, we don't find any significant variation. The overall incidence of CHE was 1.24% at the 10% threshold, and it was highest in the middle quintile. In the subgroup of diabetics, the overall incidence was 10.91% at the 10% threshold, peaking at 32.5% in poorest quintile. Across different deprivation groups, the incidence shows an increasing trend. The Kakwani index, though negative, is not statistically significant. The results of the first part of two-part model showed significant variations in the likelihood of diabetes with socioeconomic status. However, in the second part, significant variations in OOPHE were observed only by age, education, consumption and place of residence. **Discussion and Conclusion** We conclude that consumption expenditure and area-level deprivation are significant determinants of diabetes. However, OOPHE is driven by individual socioeconomic factors, with the poorest and middle-class households bearing the most burden. It points towards a lack of insurance coverage and healthcare accessibility among them. Most health insurance schemes in India exclude outpatient services. Diabetes is best treated in outpatient care settings; we thus argue that there is a need for universal health coverage, which includes outpatient treatments irrespective of socio-economic status.

Ind-1568 Financial Risk of Scaling Up Viral Load Testing to Achieve Triple 95 Target in Indonesia

PRESENTER: **Mutia Astrini Pratiwi**, ThinkWell, LLC/USAID Health Financing Activity
AUTHORS: Hasbullah Thabrany, Amalia Zulfah Wijaya, Ratu Martiningsih, Anastasia Susanto, Romauli Romauli, Diah Eva Sari Husnul Khotimah, Iko Safika, Endang Lukitosari

Introduction. In July 2024, the Ministry of Health (MOH) reported that 50% of people living with HIV (PLHIV) were receiving antiretroviral therapy (ART). Still, only 42% of those on ART achieved viral suppression, falling short of the global 95-95-95 target. Indonesia faces challenges in reaching viral suppression, the ultimate goal of its HIV program. As the country transitions to upper-middle-income status, donor funding currently covers 20% of program costs and is expected to decrease. Currently, reimbursements for viral load (VL) tests are set at IDR 45,000 (approximately US$2.90) for Point of Care (POC) machines and IDR 200,000 (approximately US$12.90) for High Capacity (HC) machines. Many healthcare providers have expressed concerns about the inadequacy of these reimbursements.

Methods. We surveyed 41 health facilities across 14 provinces to calculate the average unit costs of POC and HC machines. We estimated the required number of VL tests using data from the 2024 HIV/AIDS Information System. Our projections cover five years, from 2025 to 2030, based on four different scenarios:

1. 50% of PLHIV on ART use POC machines, and 50% use HC machines at the current reimbursement rate.
2. 31% of PLHIV on ART use POC machines, and 69% use HC machines at the current reimbursement rate.
3. Based on average unit cost estimations, 50% of PLHIV on ART use HC machines, and 50% use POC machines.
4. Based on average unit cost estimations, 69% of PLHIV on ART use HC machines, and 31% use POC machines.

Results. The average unit costs of using POC and HC machines in 2023 were IDR 913,000 (approximately US$58.87) and IDR 1.7 million (approximately US$111.37), respectively. Based on current reimbursement rates, the government should allocate between IDR 258 billion and IDR 320 billion (approximately US$17 million to US$21 million) for VL tests from 2025 to 2030. If the government pays based on market average costs, the estimated expenditure would rise to approximately IDR 2.98-3.32 trillion (US$192-214 million).

Conclusion and Policy Implications. Each funding choice has advantages and disadvantages, and the cost difference could put PLHIV at risk of not receiving appropriate VL tests, potentially leading to issues with achieving VL suppression. To minimize financial risk and ensure access to VL tests, reimbursements should be set at or above average market costs for both public and private providers. This study found that significant cost disparities could put future governments at greater financial risk when providing ART for existing and new cases.

Ind-761 Costs of Antenatal care Service Utilisation and its Effects on Low Birth Weight in Eastern Ethiopia: Implications for Improving Free Maternity Policy

PRESENTER: **Tadesse Tolossa Daba**
AUTHORS: Eric HY Lau, Merga Dheresa, Julie Abimanyi-Ochom, Ms. Lisa Gold

Background- Most SSA countries are implementing free maternity services starting from the first antenatal care (ANC) to postnatal care. However, out-of-pocket health expenditures (OOP) and opportunity cost, such as travelling time, significantly affects the utilization of maternal services in low- and middle-income countries (LMICs). Limited evidence exists on the cost incurred for maternal health service utilization and the effect of these costs on low birth weight (LBW).

Objectives- To assess the association between OOP expenditures and LBW in Eastern Ethiopia.

Method- A prospective cohort study followed 395 pregnant women for ten months to see the incidence of LBW. Cost of ANC and other follow up variables was collected during pregnancy. Direct medical and non-medical cost were summed up to give OOP expenditures. Face to face interview was used to collect data. Poisson regression with robust variance estimate was used to assess the independent predictors of LBW. Adjusted risk ratios (RR) with 95% confidence intervals were computed, and statistical significance was declared at p-value <0.05 in the final model. The direct and indirect effects of OOP and mediators on LBW was explored using a Generalized Structural Equation Modeling (GSEM). High-risk ethics application was granted from Deakin University (No 2023-342).

Result- 385 women were followed for 10 months, yielding a response rate of 97.4%. Pregnant women spent direct medical costs of 9.3 USD, direct non-medical costs of 13.7 USD, and incurred an average opportunity cost of 3.1 USD. Overall, 71.5% (95% CI: 66.4, 75.4) of women experienced OOP payment due to ANC utilization. OOP expenditure was 23.4 USD for women who gave birth to LBW baby, compared to 20.3 USD for those without LBW baby. The study found that 10.9% of women had LBW neonates. After controlling for confounding factors, OOP expenditure (aRR = 3.23, 95% CI: 1.19, 8.73), prenatal depression (aRR=2.93, 95%CI: 1.67, 5.15), and lack of birth preparedness and complication readiness (BPCR) (aRR=4.26, 95%CI: 1.59, 11.41) increased the risk of LBW. In GSEM, prenatal depression (β=1.22, CI:0.18, 2.38) and lack of BPCR (β=1.16, CI: 0.01, 2.16) mediated the association between LBW and OOP expenditures. Prenatal depression mediated the association by 25.7% and lack of BPCR mediated by 18.5%.

Conclusion- In this study, despite the ANC service being supposed to be given free of charge, the majority of the women experienced high OOP expenditures. There was a significant positive association between OOP payment and LBW which was partly mediated by prenatal depression and lack of BPCR. Therefore, policies aimed at reducing LBW should prioritize reducing financial stress during pregnancy and integrating mental health counselling, early screening and treatment programs within prenatal care services, particularly among financially disadvantageous women.

Keywords- ANC, costs, OOP, Low birth weight, Ethiopia

Ind-617 Out-of-Pocket Expenditures and Financial Risks Associated With the Treatment of Chronic Kidney Disease in Ethiopia

PRESENTER: **Solomon Tessema Memirie**, Addis Ababa University
AUTHORS: Sisay Tesfaye, Lina Mohammed Ahmedtaha, Mizan Habtemichael, Maekel Belay Woldemariam, Workagegnehu Hailu, Ole F Norheim, Hamelmal Hailegiorgis

Background: The burden of chronic kidney disease (CKD) is rapidly rising and becoming a major public health concern in low-and middle-income countries such as Ethiopia with an associated staggering economic burden. We aim to quantify the extent of out-of-pocket (OOP) health expenditures and the magnitude of associated catastrophic and impoverishing health expenditures for CKD care in Ethiopia. **Methods**: We conducted a prospective costing analysis for CKD care, from the household (patient) perspective. We collected data on OOP direct medical and nonmedical expenditures (2023 USD) and household consumption expenditures from a cohort of 433 patients that were followed prospectively for 6 months. Patients were recruited from 6 health facilities (3 government and 3 private) from 4 constituencies (Oromia, Amhara, Sidama and Addis Ababa) in Ethiopia. Data were collected from January 1 to August 31, 2023. We used descriptive statistics to measure the magnitude of OOP expenditures and the extent of catastrophic and impoverishing health expenditures. We used logistic regression model to assess the drivers of catastrophic health expenditures (CHE). **Results**: The mean annual OOP expenditures was $2,337 that varied by type of visit: $668 for outpatient visits, $2,759 for inpatient care and $5,312 for dialysis. Direct medical expenditures (particularly dialysis followed by drug and supply expenses) were the major drivers of cost accounting for 76% to 85% of the total OOP expenditures. Transportation expenditures were the major contributor among the direct nonmedical expenditures. Among those who sought outpatient, inpatient and dialysis care, 36%, 67% and 90% incurred CHE, respectively at a 10% threshold of annual consumption expenditures. The type of visit, and the type of facility visited were significantly associated with the odds of incurring CHE (p-value < 0.05) while adjusting for wealth quintile, disease stage, area of residence (urban/rural), family size, age of the patient and insurance membership status. **Conclusions**: The household economic burden for CKD care is substantial in Ethiopia. This is likely to impede access to CKD care and exacerbate the impoverishment which is prevalent in Ethiopia. This would be an obstacle in achieving universal health coverage and sustainable development goals in Ethiopia.

Ind-2682 Unequal Burden: Exploring Out-of-Pocket Healthcare Costs and Catastrophic Expenditure for Children Under Five in Northern Sri Lanka

PRESENTER: **Mathurahan Selvarasa**
AUTHOR: Anuji Gamage

Background SDG indicator 3.8.2 focuses on financial risk protection during healthcare out-of-pocket expenditure. Out-of-pocket expenses have become a growing concern in many countries, and Sri Lanka's recent economic crisis has exacerbated household out-of-pocket expenditure (OOPE) on healthcare, adversely impacting vulnerable groups, including children under five. Increasing trends of healthcare costs, with limited social security systems, have led to disparities in healthcare access and increased financial vulnerability. This study examines the patterns of OOPE and determinants of catastrophic healthcare expenditure (CHE) in Vavuniya District of Northern Sri Lanka to identify gaps and propose solutions for financial protection and equitable service delivery. **Aim** To describe the patterns of household OOPE, assess the prevalence of CHE, and identify the socio-economic and demographic factors associated with CHE among households with children under five in Vavuniya District. **Methods** This community-based descriptive cross-sectional study surveyed 359 randomly selected households with children under five from four Medical Officer of Health (MOH) areas in Vavuniya District. Data were collected using an interviewer-administered questionnaire that captured socio-demographic characteristics, health-seeking behaviors, and OOPE for healthcare services. CHE

was defined as healthcare expenditure exceeding 10% of total household income. Descriptive statistics and multivariate analyses were performed using SPSS software to identify key patterns and associated factors. **Results** The majority of the households were rural (67.41%, n=243) and comprised nuclear families (69.36%, n=249). Primary carers were predominantly female (97.78%, n=351) with majority studied upto O/L or above (90.81%, n=326) engaged in unpaid family work (80.78%, n=290). Median preventive healthcare cost was Rs. 800.00 with an IQR of Rs. 1050.00 but entirely composed of direct non-medical costs. However, private outpatient care incurred significant direct costs (mean Rs. 1684.07 per visit), while government outpatient care involved high indirect costs (mean Rs. 745.21). Fever and respiratory tract infections were the most common illnesses prompting healthcare visits. CHE was identified in 6.9% of households, with significant associations with ethnicity, household income, the number of children, and the severity of illness. Families relying on self-medication or home remedies (15.88%) exhibited higher vulnerability. **Conclusion** The study emphasises the need for policy interventions to alleviate the financial burden on vulnerable families and enhance healthcare equity. Solutions should focus on strengthening financial risk protection, promoting awareness of appropriate healthcare-seeking behaviours, and improving access to affordable, quality healthcare services for children under five. **Keywords** Out-of-pocket expenditure, catastrophic health expenditure, children under five, healthcare equity, financial protection, Vavuniya District

Ind-12 What Contributes to Out-of-pocket Health Expenditure in Cambodia's Uncovered Population? A Distributional and Decomposition Analysis Using Survey Data

PRESENTER: **Sovathiro Mao**, General Secretariat for the National Social Protection Council
AUTHORS: Andrea Hannah Kaiser, Pichenda Koeut, Marlaina Ross, Jesper Sundewall, Sokunthea Koy, Searivoth Vorn, Bjoern Ekman

Introduction: Out-of-pocket health expenditures (OOPE) are an inefficient and inequitable means of health financing. Identifying the factors driving these expenditures is crucial to design effective prepayment schemes. This study uses Cambodia—a country with high OOPE and prevalent informal employment—as a case study to analyse the relative contributions of healthcare, health, and social factors to OOPE and the OOPE budget share (OOPE as a proportion of total annual household expenditure) across different points in their distribution.

Methods: We used data from a 2023 cross-sectional survey among 3254 households engaged in informal employment with no access to prepayment schemes (uncovered households). We employed unconditional quantile regression to investigate the distributional effects of healthcare, health, and social factors on OOPE and the OOPE budget share. To examine the heterogeneity in the contributions of these factors to the explained variance in OOPE and the OOPE budget share at different quantiles, we combined unconditional quantile regression with Shapley decomposition.

Results: Uncovered households incurred high OOPE, leading to elevated incidences of financial hardship. Healthcare factors, including levels of care, private providers, medications, and visits were the largest contrib utors to the explained variance in OOPE and the OOPE budget share. Health factors, including severity, days lost to illness/injury, noncommunicable diseases, and injuries, also contributed substantially. Social factors contributed less overall, with wealth being the primary driver. Contributions of these factors varied across different points in the outcome distributions.

Conclusion: These findings underscore the need to improve financial protection for uncovered households. The Cambodian government should consider expanding prepayment schemes that directly address the main healthcare drivers identified in this study. Schemes should provide effective access to comprehensive outpatient care and essential medications, and necessary services at higher care levels, including in the private sector. Addressing the rising burden of noncommunicable diseases alongside multisectoral efforts to reduce injuries may also be important.

10:30 AM –12:00 PM TUESDAY [Health Care Financing & Expenditures]

Bali International Convention Centre – Denpasar A

Improving Health Insurance Uptake and Targetting

MODERATOR: **Dominic Albert Nkhoma**,

Ind-1453 Effect of Free Healthcare Policies on Health Insurance Enrolment and Determinants of Enrolment Among Informal Sector Workers in Kenya

PRESENTER: **Phidelis Wamalwa**
AUTHORS: Christoph Strupat, Ms. Manuela De Allegri

Background: Many Sub-Saharan African countries are transitioning from free healthcare to national health insurance (NHI) policies to ensure sustained financing for universal health coverage policies. Informal sector workers (ISWs) are usually excluded from government subsidies and expected to contribute directly to the scheme. This leads to them being described as “missing middle” since their low incomes often result in inadequate coverage, perpetuating healthcare access inequalities. This paper describes current coverage rates among ISWs in Kenya, their

determinants and equity implications, and examines the extent to which the implementation of free healthcare policies can serve as catalyst for ISWs' decision to enrol in and contribute to insurance.

Methods: We used nationally representative repeated cross-sectional household data collected among ISWs in Kenya in 2018 (1118 households) and 2020 (2608 households) before and after the rollout of the free healthcare pilot, respectively. Our analysis included a total of 6900 (2354 in 2018 and 4546 in 2020) individuals, from the age of 18 years and above. We employed a two-level mixed effects logistic regression model to assess the determinants of NHI enrolment, and examined the socio-economic inequalities in NHI enrolment using concentration curves and the Wagstaff index. We constructed a pre-and-post, quasi-experimental design applying difference-in-differences estimation modelling to assess the effect of exposure to the free healthcare policy pilot on individuals' decisions to enrol later in the NHI Scheme.

Results: The overall NHI enrolment rate was 21.75% (95% CI 20.63-22.89). Determinants such as age, employment, microfinance institution membership, advanced education level, wealthiest households, and satisfaction with quality of care were significantly (p value <0.05) positively associated with NHI enrolment. The study further found pro-rich inequalities in NHI scheme enrolment with a concentration index of 0.35 (95% CI 0.30-0.41; p-value <0.001). As regards the effect of the free healthcare policy, enrolment in the NHI Scheme increased by 7%, from 15.2% to 22.2% (p = 0.04), in the intervention counties. Individuals in the intervention counties had a 65% greater probability of enrolling in the National Health Insurance Scheme than did those in the control counties (odds ratio-1.65; p=0.071).

Conclusion: The free healthcare policy favoured the decision to enrol in the NHI Scheme. However, enrolment rates among ISWs remain low, and significant pro-rich inequalities exist, primarily driven by age, economic factors, education, and perceived quality of care. Policymakers should consider exploring non-traditional communication channels to educate ISWs about NHI enrolment procedures and benefits. Utilizing microfinance institutions as onboarding structures, assigning premiums based on affordability, and expanding subsidies for low-income ISWs can help increase awareness, improve affordability, and reduce disparities, ultimately boosting enrolment. These findings are relevant to low- and middle-income countries implementing or considering to implement contributory NHI schemes. The findings are particularly important to Kenya, informing the process of ISWs inclusion as the country transitions to mandatory NHI enrolment policy.

Ind-973 Heterogeneous Preference for Supplementary Health Insurance: A Behavioral Economics Perspective

PRESENTER: **Lizheng Xu**
AUTHORS: Chaofan Li, Lei Si, Stephen Jan, Shunping Li, Jiaqi Yuan

Aims: Despite the universal health insurance coverage achieved in 2011, patients in China with serious health conditions, such as cancer and rare diseases, continue to face high risks of having catastrophic health expenses. Supplementary health insurance has the potential to reduce such risks. This study aims to assess residents' preferences for supplementary health insurance and analyze the heterogeneity from behavioral economics perspective. **Methods**: We conducted a discrete choice experiment (DCE) with five key attributes: premium (4 levels), benefit package (4 levels), deductible (3 levels), reimbursement rate (3 levels), and coverage for pre-existing conditions (3 levels). The attributes and levels were developed through literature review, policy comparison, Delphi method, and qualitative interviews with residents. Using a D-efficient design, we constructed 14 unlabeled choice sets, randomly assigned into two blocks. Respondents chose between two alternatives and an opt-out option in each choice task. A pilot survey assessed questionnaire feasibility, leading to refinements in attributes and levels. For the formal survey, 1,359 respondents were selected from 12 counties across three Chinese provinces using quota sampling according to residential location and age. Data were collected through face-to-face, computer-assisted interviews conducted by trained interviewers. After excluding invalid questionnaires, 1,254 responses were analyzed using conditional and mixed logit models to estimate attribute coefficients, relative importance scores, and willingness to pay. We further explored preference heterogeneity across disease risk awareness, numeracy, and risk attitudes using mixed logit models with interaction terms and subgroup analysis. **Results**: Among the 1,254 respondents, over 70% were female, and half resided in rural areas. Roughly 37% were aware of the risk of medical expenses, 16% had high numeracy, and 53% held risk-averse attitudes. A significantly negative coefficient of the "opt-out" option (β = -9.742, p<0.001) indicated a preference for enrolling in supplementary health insurance over the status quo. All attribute coefficients were statistically significant (p<0.01), with relative importance scores as follows: reimbursement rate (31.62%) > premium (30.83%) > benefit package (16.24%) > deductible (16.15%) > coverage for pre-existing conditions (5.15%). Respondents were willing to pay RMB 327.08 for a 90% reimbursement rate, RMB 182.32–287.66 for an expanded benefit package, and RMB 146.70–180.13 for including pre-existing conditions. The mixed logit model with interaction terms revealed that preferences for supplementary health insurance varied significantly (p<0.05). The respondents with high numeracy, disease risk awareness and risk aversion attitude were more likely to prefer enrolling in supplementary health insurance than opt out (p<0.05), and they also had higher preference for deductible 5,000 RMB than for deductible 20,000 RMB. **Conclusion**: Most respondents expressed willingness to enroll in supplementary health insurance, showing the highest preference for attributes of reimbursement rate and premium, moderate preference for benefit package and deductible, and lowest preference for reimbursement of pre-existing conditions. Heterogeneity analysis suggest that interventions aimed at improving risk communication and numeracy may enhance uptake rates for supplementary health insurance.

Ind-1853 The Double-Edged Sword Effects of Medical Insurance Integration on Health Equalities: Evidence From a Quasi-Natural Experiment in China

PRESENTER: **Jianhui Wang**
AUTHOR: Miao Yu

Background: Health inequality among different demographic groups have attracted wide attention in both developed and developing countries, as it stems from the unequal distribution of resources such as income, household registration, medical care, and pension. Governments worldwide have been working hard to carry out institutional reforms to address health inequality and maintain social stability, but the impact of these reforms on promoting equitable health outcomes remains unclear.

Objectives: This study focuses on China's urban and rural social medical insurance integration reform. China has been working hard to integrate the medical insurance schemes for urban and rural residents into a unified program, with the goal of mitigating disparities in medical insurance coverage and enhancing welfare benefits for rural residents. The objective of this study is threefold: i) Develop a comprehensive indicator to reflect the health status of urban and rural residents before and after the reform. ii) Assess the impact of reforms on health equalities between and within urban and rural residents. iii) Explain the mechanisms that contribute to the narrowing or widening of health inequality.

Design: The study utilizes *a quasi-natural experiment design*. Three *primary datasets* are used: i) Medical Insurance Integration Policy Dataset, which records the timing of integration reform in each city. ii) Individual's Health Outcomes Dataset, derived from the China Family Panel Studies, a national longitudinal study conducted from 2012 to 2020, providing data on self-rated health, physical health, mental health, and personal characteristics. iii) Income and Expenditure Data of China's City Government Medical Insurance Fund, collected from China's city statistical yearbook. The study employs three *methods*. The entropy method to measure comprehensive health indicators; staggered Difference-in-Differences (DID) to evaluate the impact of the integration reform on health outcomes; and the concentration index and decomposition method to estimate health inequality among rural residents at different income levels pre and post reform.

Results: The urban-rural medical insurance integration reform has a "double-edged sword" effect. It significantly improves the health outcomes of rural residents while not having a positive effect on urban residents, indicating a successful narrowing of health disparities between urban and rural areas. Mechanism tests reveal that the reform leads to higher health awareness, medical service utilization, and preventive consumption among rural residents, reducing inequality between urban and rural areas. However, the reform also widens health inequality within rural groups. Higher-income groups in rural areas utilize more medical services and receive greater government compensation, resulting in a reverse subsidy phenomenon where the poor subsidize the rich. Regional disparities in medical insurance fund compensation levels further contribute to heterogeneous health inequality.

Conclusions: Accelerating the integration of urban and rural medical insurance systems is an effective approach to reduce unfair treatment between urban and rural areas. However, when policy resources are not effectively allocated, new inequalities may arise. Therefore, the implementation of medical insurance policies should be more refined. For instance, providing financial compensation to areas with limited medical resources and establishing a multi-level social medical security system for residents at different income levels can address these issues.

Ind-284 Toward Risk-Adjusted Capitation for Primary Care in Nigeria: Evidence from Kaduna State's Social Health Insurance Scheme

PRESENTER: **Abubakar Yerima Mohammed**
AUTHORS: Catherine Goodman, Olufunke Fasawe, Abubakar Muhammad Hassan, Bala Sai'du

Background:

Effective provider payment mechanisms that align provider incentives with payer objectives are essential for achieving Universal Health Coverage (UHC) goals. However, this remains a significant challenge in Nigeria. State Health Insurance Agencies (SHIAs) primarily use crude capitation as the payment mechanism for primary care, with a capitation value of just N500 ($0.31) per life. This low and unadjusted rate leads to challenges such as risk selection, quality skimping, and under-provision of care. While risk-adjusted capitation has the potential to mitigate these issues, research on its implementation in Nigeria, particularly within state social health insurance schemes, is limited. This study addresses this gap by analyzing the factors influencing primary care service utilization under the Kaduna State Social Health Insurance Scheme, providing evidence to guide the development of equitable and effective capitation adjustments.

Methodology:

The study employed robust administrative datasets sourced from the Kaduna State Contributory Health Management Authority (KADCHMA). Data on primary care utilization from public primary health facilities and the comprehensive database of enrollees were merged to create an analytical master dataset. After applying the Multivariate Imputation using Chained Equations (MICE) technique to address missing data, multivariate logistic regression was employed to ascertain the relationship between primary care utilization and four predictive factors—age, gender, socioeconomic status, and geographical location.

Results:

The findings indicate that the middle-aged group (30-59 years) exhibited a heightened likelihood of primary care utilization, contrasting with lower utilization likelihood among those below 20 years and above 60 years. Females were 8.5% more likely to utilize primary care compared to males. Enrollees who paid insurance premiums demonstrated a 33% increased likelihood of primary care utilization relative to the poor enrollees who cannot afford insurance premiums that are covered by government subsidy insurance programs. Additionally, rural, and semi-urban residents exhibited a higher likelihood of using primary care services compared to urban residents.

Conclusion and Policy Implication:

This study has unveiled the existing inequities in access to primary care services under the Kaduna SSHIS, further accentuating the imperative for risk adjustment of capitation for primary care services. Moreover, the research highlights the distinct and significant predictive roles of demographic factors (age and gender), socioeconomic status (as reflected in insurance premium payment capacity), and geographical location (urban, rural, or semi-urban) in primary care utilization. Consequently, the findings support the appropriateness of these variables as essential needs factors for adjusting capitation payments for primary care services within the Kaduna State Social Health Insurance Scheme.

As Nigeria's new administration embarks on designing version 2.0 of the Basic Health Care Provision Fund under the Health Sector Renewal

Investment Program, this study offers valuable insights into how health care needs can inform equitable capitation adjustments and facility budget allocations. However, for evidence-based resource allocation to be effective, significant investments in robust data systems are imperative. The study also identified systemic weaknesses, including manual reporting and low service utilization data reliability, which must be addressed to ensure sustainable improvements in health care delivery

Ind-1348 Leveraging Machine Learning to Predict Hospital Activity in Kazakhstan Using Health Insurance Data

PRESENTER: **Daliya Kaskirbayeva**
AUTHOR: Tim Ensor

Kazakhstan introduced compulsory social health insurance (CSHI) schemes in 2020 as part of its efforts toward achieving universal health coverage. The current financial planning tool for hospital services in Kazakhstan, integrated into the CSHI, relies on a linear regression-based approach to predict hospital activity. Adequate prediction of hospital activity is crucial for insurance systems to ensure the sustainability and adequacy of premiums to cover healthcare costs. This study aims to evaluate the performance of machine learning (ML) models in comparison to the linear regression model currently used by the government. **Methods** We analyzed Kazakhstan's national hospital episode statistics from 2021 to 2023 using machine learning models, including Extreme Gradient Boosting (XGBoost) and artificial neural networks, to predict hospitalization rates and lengths of stay. A systematic literature review was conducted to identify parameters commonly used in regression and machine learning models for such predictions. Based on the findings, we included sociodemographic variables (age, gender, occupation, and region of residence), health-related variables (diagnosis, admission and discharge dates and times, ward type, procedures, hospital outcomes, and emergency vs. elective admission status), and hospital-level variables (e.g., rural vs. urban location, referring primary care facility location, hospital ownership, payment schemes such as the guaranteed package or health insurance, geographic location, bed capacity, and availability of medical and non-medical staff). **Results** The dataset included all hospital episodes reimbursed by the centralized health services purchaser (Health Insurance Fund): 3013041 observations in 2021, 3 313 144 in 2022, and 3 684 455 in 2023. Machine learning models demonstrated higher accuracy, measured by the area under the ROC curve (AUC), than traditional regression models when applied to the same dataset used for training. **Conclusion** Extreme gradient boosting showed superior predictive performance compared to the linear regression model traditionally used by Kazakhstan's Ministry of Health. Model performance improved further when a more restricted set of variables was used. To enhance prediction accuracy, more detailed patient-level data (e.g., education level) and hospital-level data (e.g., human resource training for medical equipment use) are needed. Improved prediction models can support better decision-making at both government and clinical levels.

10:30 AM –12:00 PM TUESDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Bandung

Modelling Frameworks for Valuing Health Economic Outcomes

MODERATOR: **Nhung Nghiem**, "John Curtin School of Medical Research, Australian National University"

Ind-640 How Ageing People Respond to Severe Health Shock: the Effect on Consumption, Income and Wealth

PRESENTER: **YI SUN**

This study examines the economic impact of spousal loss on older adults in the UK, leveraging harmonized longitudinal data from the English Longitudinal Study of Ageing (ELSA). Unlike existing literature centered on US datasets with high out-of-pocket healthcare costs, this analysis situates spousal loss within the UK's universal and low-cost healthcare system. The findings reveal a significant and sustained increase in surviving spouses' consumption, particularly in leisure and food expenditures, accompanied by a marked decline in household income. While these trends challenge conventional models predicting resource-constrained consumption following health shocks, the evidence highlights the role of resource redistribution within households. Wealth effects are modest. These insights suggest that, in a context of minimal medical expenditure risks, lifestyle changes and reallocation of financial resources drive observed patterns in post-widowhood economic behavior. Methodologically, the study employs the staggered Difference-in-Differences approach to account for heterogeneous treatment timing and ensure causal inference. Event study analyses confirm the exogeneity of the widowhood shock, with pre-trends validating parallel trend assumptions. This research contributes to the literature on economic adjustment to life shocks by highlighting how older adults, even in the absence of labor income, actively restructure spending and adapt to changes in household composition. The findings offer new insights for policy efforts aimed at supporting financial resilience in later life.

Ind-772 The Value of Age, Sex and Disability Level in Decision Strategies for Surgical and Conservative Treatments of Adult Spinal Deformity

PRESENTER: **Alessio Pignatellli**
AUTHORS: Noor Alesawy, Khaled Kebaish, Amit Jain, Tej Azad

Background

Adult Spinal Deformity (ASD) refers to spinal abnormalities that lead to misalignment of the spine, often causing pain, disability, and reduced quality of life. It is increasingly common in an aging population. Surgery generally yields better outcomes than non-surgical treatments, however it is a costly procedure with high rates of complications.

Objective

The goal of this project is to develop treatment guidelines based on age, sex, and disability level to maximize the total net benefits in the US

ASD patient population, and to quantify the value of adopting these demographic-informed strategies. The additional aim is to determine the residual value attainable with perfect information to evaluate the potential for research on other predictors of treatment outcomes.

Methods

Three treatment strategies are considered: surgery, non-operative care, non-surgical care followed by delayed surgery for non-responders. Treatment strategies and outcomes are modeled in a decision tree, using stochastic distributions with demographic-dependent parameters from our dataset or literature. The US ASD population size and composition is estimated from prevalence for subjects aged 40-80. 1,000 Monte Carlo simulations of the whole population are used for estimation. Utility scores (SF6D) were derived from ODI data and converted to QALYs, then translated to monetary benefits using willingness-to-pay (WTP). The net benefit is:

Net benefit = QALY monetary benefit - Direct costs - Opportunity costs + Productivity change

Net benefits are calculated at the population level for each full population treatment strategy, and for the best demographic-based treatment strategy. The value of each strategy is defined as the difference between such strategy and the worst-case scenario of assigning each patient to their least beneficial treatment. The percent value of a strategy is calculated from the ratio of the value of the given strategy and the value of the best-case scenario of assigning each patient to their most beneficial treatment. The difference between the value of the best-case scenario and the best demographic-based treatment strategy is the residual value.

Results

Net benefits are primarily driven by QALY monetary benefits and direct costs. Baseline disability level has the biggest impact on net benefits of different treatments. Within the same disability group, surgery is preferred in younger patients. Exact age cutoffs for treatment preference depend on the WTP per QALY. When treating the US ASD population, the value of the best demographic-based strategy is $1,938 - $2,144 billions (at WTP 91,000 - 140,000 $/QALY). Notably, this is $2 - $72 billions higher than conservative treatment for all, which is the best strategy ignoring demographic covariates. The percent value of the demographic-based strategy is 71% - 61%, which means the residual value is $774 - $1,375 billions.

Conclusions

Demographic covariates such as age, sex, and disability level should inform treatment decisions and have great cost-saving potential. The high residual value illustrates a need to determine additional treatment outcome predictors, especially in younger patients, to reduce variance in predictions and edge closer to ideal treatment allocation. In practice, such research and implementation could lead to better patient outcomes at lower relative cost.

Ind-786 Choosing Wisely: Evaluating Latent Factor Models in the Presence of a Contaminated Instrumental Variable with Differing Strength

PRESENTER: **Souvik Banerjee**, Indian Institute of Technology Bombay
AUTHORS: Anirban Basu, Shubham Das

Background: Causal inference methods are widely used in empirical research; however, there is a paucity of evidence on the use of latent factor methods in the presence of a contaminated instrumental variable (IV) for different strengths of the instrument. Objective: We aim to build on and extend the work of Banerjee and Basu (2021) in multiple ways: (i) we discuss the identification criteria for the shared latent factor (SLF) and SLF+IV models, (ii) we provide a theoretical framework to illustrate how the strength of IV and contamination determine the optimal choice between Two Stage Least Square (2SLS), SLF, and SLF+IV estimators, (iii) we compare the finite sample properties of the Ordinary Least Squares (OLS), SLF, 2SLS, and SLF+IV estimators in terms of percentage bias, standard error, coverage probability, and Mean Squared Error (MSE) for different degrees of contamination and strength of the IV, and (iv) we empirically test the OLS, 2SLS, SLF, and SLF+IV models using survey data. Methods: We present a theoretical formulation to depict how the strength and degree of contamination of the IV contamination simultaneously determine the optimal choice of estimator. We performed Monte Carlo simulations with four outcome variables, with sample sizes of 500 and 1000, and for 1000 iterations. We further applied the OLS, 2SLS, SLF and SLF+IV models to study the causal impact of obesity on various health indicators (diastolic and systolic blood pressure readings, blood glucose level, and haemoglobin count), using the arm circumference as an IV and the 2019-2021 Round 5 of the National Family Health Survey (NFHS-5) data. Results: Findings from the simulations indicate that, for a given level of strength of the IV, the SLF+IV estimator has a lower bias than that of the SLF estimator at lower degrees of contamination. However, beyond a certain threshold degree of contamination, the bias of the SLF+IV estimator becomes greater than that of the SLF estimator. The simulation results further highlight that if the IV is strong, then the SLF+IV estimator has a lower bias than the SLF estimator. However, if the IV is weak, then the SLF+IV estimator may or may not have a lower bias than the SLF estimator. The findings from the simulations are consistent with the theoretical results. In our empirical application, all the models reveal that obesity is associated with higher levels of diastolic and systolic blood pressure readings, blood glucose level and haemoglobin count, which indicates that obesity increases the risk of hypertension and diabetes but lowers the risk of anaemia. Discussions: Both SLF and SLF+IV estimators perform better than the traditional OLS and 2SLS estimators in terms of bias and MSE. A strong and less contaminated IV makes the SLF+IV estimator a better choice than the SLF estimator, while a weak and highly contaminated IV makes the SLF estimator a better choice than the SLF+IV estimator.

Ind-935 Causal Inference with Time-to-Event Outcomes: A Debiased Machine Learning Framework for Treatment Parameters

PRESENTER: **Meimei Chen**
AUTHORS: Henry Cutler, Yuanyuan Gu

Background: Causal inference is crucial in health econometrics for assessing the effectiveness and impact of health interventions. Traditionally, Randomised Controlled Trials are used to identify causal impact. However, advancements in data collection technologies, such as wearable devices and electronic health records, have significantly increased access to complex observational data, presenting new opportunities and challenges for health outcome evaluation. Concurrently, machine learning (ML) has gained recognition for its ability to handle and analyse large, complex datasets. This has led to the development of methods integrating ML with causal inference, including the notable approach of double machine learning (DML).

Objective: This research aims to adapt the DML framework for use with survival data, which are critical in health economics research for understanding survival and duration until events. The proposed method in this research allows for the use of a broad array of state-of-the-art ML methods while ensuring that the estimator remains unbiased and normally distributed asymptotically, which allows for the derivation of valid confidence intervals.

Methodology: This research develops a new framework for causal analysis with right-censored time-to-event data based on DML. In addition to the three fundamental assumptions of Rubin's potential outcome framework (i.e., exchangeability, consistency, and positivity), we assume that censoring is independent of the treatment assignment mechanisms, given all covariates. To remove bias introduced by ML methods, we provide a Neyman orthogonal score function for the parameters of interest, nuisance parameters, and censoring indicator. The Neyman orthogonality ensures that the estimator, which identifies our parameters of interest, is locally insensitive to the values of nuisance parameters. We also prove that estimators given in our research achieve a root-N rate of convergence and are approximately normally distributed.

Results: We used both simulated and real-world datasets to evaluate the accuracy and stability of our method. First, we showed that various state-of-the-art ML models, including random forests, gradient boosting machines, and neural networks, can be integrated into our method to estimate the nuisance parameters without compromising the consistency of our parameters of interest. Second, we compared the performance of our method with several conventional statistical methods on simulated datasets. We showed that as the number of nuisance parameters increases, our method remains stable. Third, we applied our method to a real-world dataset from the Linked Births and Infant Deaths Database (LBIDD). We compared our method to alternatives based on absolute bias, mean squared error, and standard deviation. Our method exhibited relatively smaller bias and lower variance.

Conclusion: Our research successfully extended the causal inference framework DML to incorporate time-to-event outcomes, showing robust performance on both simulated and real-world datasets. This method offers a powerful tool for health economists, enabling more accurate causal inference in studies involving survival data.

Ind-2847 Health Literacy's Effects on Health Outcomes and Healthcare Utilization: A Path Analysis of Tribal and Non-Tribal Populations in India

PRESENTER: **Kripa Nandan**
AUTHOR: Pratap C. Mohanty

Introduction: Health literacy is a crucial determinant of health outcomes and healthcare utilization, encompassing the ability to access, understand, evaluate, and apply health information for informed decision-making. This study examines the effects of health literacy on health outcomes and healthcare utilization among tribal and non-tribal populations in India, using path analysis. The research focuses on two districts in Odisha: Mayurbhanj, predominantly tribal, and Khordha, with a more diverse population. **Methods:** A multi-stage purposive cross-sectional survey was conducted from January to June 2024. The study employed the HLS-EU-Q47 comprehensive health literacy questionnaire, a validated tool with 47 items rated on a 5-point Likert scale. The questionnaire was translated into Hindi, Odia, and Santali, and also administered in English. It assesses four competencies: accessing, understanding, evaluating, and applying health information across healthcare, disease prevention, and health promotion domains. Reliability was confirmed with a Cronbach's alpha of 0.9449 and a split-half reliability of 0.823, indicating high internal consistency. Participants had a mean age of 42.59 years. In Mayurbhanj, 62.43% were aged 18-45, while in Khordha, this group comprised 64.33%. Gender distribution was balanced, with 57.51% male in Mayurbhanj and 55.62% in Khordha. Income and education levels varied significantly between the districts. **Data Analysis:** Path analysis was conducted using SPSS 27 to explore the relationships between health literacy, health outcomes, medical expenditure, interest in health-related activities, and healthcare utilization. The model's fit was evaluated using several fit statistics: the relative Chi-square Model-Fit Statistic, Adjusted Goodness-of-Fit Index (AGFI), Normed Fit Index (NFI), and Root Mean Squared Error of Approximation (RMSEA). A good model fit is indicated by an AGFI greater than 0.90, an RMSEA less than 0.05, and an NFI greater than 0.90. These indices collectively provide a robust assessment of the model's validity. **Results:** The path analysis revealed significant pathways through which health literacy impacts health outcomes and healthcare utilization. Higher health literacy was associated with better health outcomes and more efficient healthcare utilization, reducing unnecessary medical expenditures. The effects were more pronounced in the tribal population of Mayurbhanj, highlighting the critical role of culturally and linguistically tailored health literacy interventions. **Discussion:** The findings underscore the importance of enhancing health literacy to improve health outcomes, optimize healthcare utilization, and increase interest in health-related activities, particularly in tribal communities. The study highlights the need for targeted health literacy programs that consider cultural and linguistic contexts to effectively address health disparities. **Conclusion:** This research provides valuable insights into the role of health literacy in shaping health outcomes and healthcare utilization in diverse populations. By employing a path analysis approach, the study offers a nuanced understanding of the complex interrelationships between health literacy and health-related behaviors, informing policy and practice aimed at improving health literacy and reducing health inequities in India.

Bali International Convention Centre – Executive Room 1

Economic Burden of Disease

MODERATOR: **Asih Eka Putri**, Dewan Jaminan Sosial Nasional

Ind-63 Australian Epilepsy Project: Health Economic Perspectives on Epilepsy

PRESENTER: **Gopisankar Mohanannair Geethadevi**
AUTHORS: Patrick Kwan, For the Australian Epilepsy Project Investigators, Graeme Jackson, Zhibin Chen, Emma Foster, Zanfina Ademi

Background: In Australia, approximately 3-4% of the population will develop epilepsy at some point in their lives. European studies indicate that over 75% of the total healthcare costs of epilepsy are indirect, with 80-92% arising from absenteeism. The remainder is attributed to informal care, loss of productivity, and premature mortality. There is currently no robust, national Australian data on absenteeism or presenteeism due to epilepsy. This project utilised baseline data from the Australian Epilepsy Project (AEP), a prospective study that collects health and economic data from individuals with epilepsy, to address this gap.

Methodology: The AEP included three clinical subgroups: (a) focal and drug-resistant epilepsy (DRE), (b) first unprovoked seizure (FUS), and (c) newly diagnosed epilepsy (NDE). The primary objectives of the health economic sub study were to estimate quality of life based on the EQ-5D-5L questionnaire, and disease specific using QOLIE-31, informal care contribution, and presenteeism and absenteeism in a week using the Work Productivity and Activity Impairment (WPAI) questionnaire. Depending on the type and distribution of variables, univariate analyses were conducted to understand their influence on outcomes using generalized linear models, mixed methods models.

Results: A total of 854 people registered at baseline AEP: 46% had DRE, 34% had NDE, and 18% had FUS. The cohort was 47% female, with a mean age of 37 (SD 13). 66% (n = 258) were employed. The median (IQR) number of seizures in the previous 12-month among DRE, FUS and NDE were 50 (13 – 158), 1 (1 – 1) and 4 (2 – 21) ($p<0.001$: DRE vs NDE and FUS) respectively. Median (IQR) EQ-5D-5L values for the cohort was 0.93 (0.14) which did not differ between diagnostic groups. The mean QOLIE-31 score among DRE, FUS and NDE was 49.3 (17), 60.6 (15.4) and 57.1 (17.7) ($p<0.001$; DRE vs both FUS and NDE). The seizure worry sub-question in QOLIE-31, was the highest for individuals with DRE ($p<0.001$; DRE vs both FUS and NDE). The overall informal care requirement was 20% with the higher for DRE (25.3%; $p<0.001$) compared to FUS. Those with DRE were less likely to be employed (58%) compared to 80% of FUS ($p=0.002$), and 71% of NDE ($p= 0.016$) participants being employed. Of those employed, the mean (SD) hours missed due to epilepsy in a week was 5.1 (18). The mean percentage (SD) of absenteeism, presenteeism, work impairment, and impact on regular activities were 11 (24), 18 (26), 24 (32) and 28 (30) respectively. The mean percentage of presenteeism was 22.7 (28.8), 17.1 (22.7) and 13.6 (24.7) for DRE, NDE and FUS respectively ($p= <0.001$: DRE vs NDE). The mean percentage of impairment on daily activities was 35.7 (31.9), 22.6 (27.7) and 20.2 (28.3).

Conclusions and implications: Up to a quarter of a person's weekly work was negatively impacted by epilepsy. People with DRE experienced more seizures, higher rates of unemployment, increased presenteeism, greater worry about seizure recurrence, and a lower quality of life. Additionally, they faced a greater need for informal care.

Ind-147 Evaluating Health Through the Lens of Productivity Gains

PRESENTER: **Zanfina Ademi**, Monash University
AUTHORS: Melanie Lloyd, Maria Arvez, Dina Abushanab

Objectives: Traditional health economic evaluations often use the years of life lived and quality-adjusted life years (QALYs) to assess mortality risk reductions and health improvements. To advance discussions toward more robust prevention strategies and account for broader economic impacts, we developed a new metric, Productivity-Adjusted Life Years (PALYs), aimed at capturing a more comprehensive view of health's societal contribution. Our objective was to conduct a systematic review illustrating the application of PALYs as an outcome measure across various disease contexts.

Methods: We conducted a comprehensive review of studies utilising PALYs to identify effective methods for decision-making and to illustrate their applications. Using a snowball search, we selected studies that applied PALYs to quantify societal health burdens in specific diseases or contexts. Extracted data included health conditions, country setting, timeframe, model type, outcomes, data type (incidence/prevalence), discounting, time horizon, prevention strategies, working-age population, productivity index components, PALY economic value, GDP, and sensitivity analysis details. Income level classifications were based on World Bank standards, and findings were summarized through narrative synthesis.

Results: We identified 34 studies published between 2018 and 2024, with most from 2020–2023. These studies spanned health conditions from chronic diseases, such as cardiovascular and kidney disease, to environmental factors like PM2.5 exposure. Most were conducted in high-income countries (n=20), followed by upper-middle-income (n=9), lower-middle-income (n=4), and low-income (n=1) settings. Life table models (n=23) and dynamic models (n=8) were predominant, with other methods including mathematical projection, questionnaires, and cross-sectional designs. Prevention-focused studies (n=18) outnumbered those on chronic disease management (n=14), with two studies addressing both. From a population perspective, diabetes, hypertension, sleep apnoea, cardiovascular diseases, and non-optimal temperatures imposed the greatest societal burden, while epilepsy resulted in the most significant losses in life years and productivity-adjusted life years. Most studies

included presenteeism and absenteeism (n=26) in their productivity index; four included mortality, eight included labour force participation, and three included absenteeism alone. Productivity loss values ranged from US$1,137 to AU$217,983 per full-time worker.

Conclusion: The diversity of health conditions and economic contexts covered in these studies highlights a broad interest in the determinants of health as measured by the PALY metric. This diversity is essential, as it provides a comprehensive understanding of the economic impacts associated with varied health challenges. Moreover, the emphasis on prevention over chronic disease management suggests a strategic shift toward averting disease onset.

Ind-264 Factors Associated With Sickness Absenteeism and Presenteeism in a Canadian Working Population

PRESENTER: **Wei Zhang**, University of British Columbia
AUTHORS: Hong Qian, Jacynthe L'Heureux, Gary Johns, Mieke Koehoorn, Simon Woodcock

Background

Many economic evaluations conducted from a societal perspective have not considered absenteeism or presenteeism, two important work productivity loss components. One of the reasons is a lack of existing estimates that can be incorporated in the economic evaluations.

Objective

To estimate absenteeism and presenteeism among a representative sample of the Canadian working population, and identify associated factors.

Methods

Questions regarding absenteeism and presenteeism were added to the Canadian Community Health Survey as a rapid response module, which was conducted by Statistics Canada in July to December 2022. Eligibility for this module included 1) aged 15-75 years, 2) working at a job or business as their main activity in the past 12 months, 3) having worked at a job or business in the past 3 months, and 4) not “permanently unable to work”. We excluded some respondents through logic checks, e.g., if their reported absenteeism and presenteeism in the past 7 days were greater than those reported for the past 3 months.

Absenteeism was measured as the number of absent workdays because of health in the past 3 months. Presenteeism was measured as the number of days worked while experiencing health problems in the past 3 months. Linear regression using backward selection method (p value <0.2) was used to identify factors associated with absenteeism and presenteeism. Age, age squared, gender and chronic conditions (14 conditions) were included in the regression models regardless of statistical significance. Other factors included ethnicity/identity, immigrant status, province, education, household income, occupation, industry, self-employment status, full/part-time work status, telework status, work schedule/shift, self-perceived work stress, body mass index classification, type of smoker, and type of alcohol drinker.

Results

There were 9,148 survey respondents meeting our inclusion criteria. Chronic fatigue syndrome (3.14 days), multiple chemical sensitivities (2.27), fibromyalgia (1.92), and mood disorder (1.80) were associated with more absenteeism days in a 3-month recall period, compared to those without the corresponding chronic condition. Lower education was associated with more absenteeism. Compared to public administration industry, some industries, such as accommodation and food services, were associated with lower absenteeism. People who perceived their work as extremely stressful were absent from work for 1.69 more days than those without work stress.

Stroke (13.18 days), chronic fatigue syndrome (10.89), fibromyalgia (10.54), and post-traumatic stress disorder (8.07) were associated with more presenteeism days. People reporting Indigenous identity had 2.63 more presenteeism days than people who did not identify as a visible minority. People working in the health care and social assistance industry had 1.81 fewer presenteeism days than those in public administration industry. More presenteeism days were associated with annual household income <$100,000, being self-employed, working full-time, feeling quite a bit or extremely stressed at work, being underweight, or former daily smokers. Fewer presenteeism days were associated with regular drinkers.

Conclusions

Our results found both similar (e.g., chronic conditions and work stress) and different factors (e.g., household income and self-employment status) associated with absenteeism and presenteeism. The findings are intended to inform the inclusion of absenteeism and presenteeism in future economic analyses.

Ind-616 The Cost of Illness of Three High Burden Sexually Transmissible Infections; Chlamydia, Gonorrhoea and Syphilis in Australia.

PRESENTER: **Caroline Watts**, UNSW Sydney
AUTHORS: Virginia Wiseman, Rebecca Guy, Htein Linn Aung, Christopher K. Fairley, Nicholas Medland, Jane Hocking

Background Estimating the economic burden of priority sexually transmitted infections (STIs), chlamydia, gonorrhoea and syphilis, is important for policy making in regard to prioritising public health interventions and the allocation of resources. In Australia, and many countries globally the rate of STIs has increased considerably over the past decade. If untreated, these STIs are major causes of morbidity in women and men. For women, chlamydia and gonorrhoea can cause pelvic inflammatory disease leading to chronic pain, infertility and ectopic pregnancy. Syphilis can cause severe multi-organ disease, and stillbirth and malformations in babies. There is very little data on the economic

burden of STIs in Australia. **Aims** To estimate the cost of chlamydia, gonorrhoea and syphilis infections to the Australian society in 2019 (pre COVID-19 pandemic) **Methods** A prevalence-based approach was adopted which included all the costs associated with prevalent cases in 12-month period. Direct health system costs included costs of testing, consultations, medications, hospital services. Indirect costs related to productivity losses due to morbidity were also estimated. The analysis also included costs related to STI testing and management in jurisdictions which do receive funding through the universal insurance scheme such as publicly funded sexual health and community clinics, Australian Defence force personal and people who are incarcerated. Because COVID-19 resulted in a decline in the use of sexual and reproductive health service use, 2019 was chosen as the base case. **Results** In 2019, the annual direct health system cost of the STIs chlamydia, gonorrhoea and syphilis in Australia was estimated at $443.9 million of which 68% was for women and 32% for men. By infection type, the total (direct and indirect) annual cost for chlamydia was $192.0 million (SD 6.7) which accounted for 43% of total costs, for gonorrhoea $167.3 million (SD 5.9) which accounted for 38% of total costs and syphilis was $84.7 million (SD 2.9) which accounted for 19% of total costs. Productivity costs accounted for 20% of costs for women, 15% of costs for men. Reflecting that testing and management of STIs is largely conducted by general practitioners in Australia, 41%-47% of direct costs were related to consultations, 36%-49% to pathology, 8%-14% of costs due to hospital related expenditure and 0.2%-2% of expenditure from pharmaceuticals and medical imaging. By sector 67% of costs were funded through Australia's universal health insurance schemes, 15% funded through other government funding mechanisms and 18% of costs were due to productivity losses. **Conclusion** This study highlights the substantial cost of the STIs chlamydia, gonorrhoea to society. Further research is required to quantify the intangible costs associated with STIs. These results can inform economic evaluations to identify cost-effective STI prevention strategies to reduce this burden.

Ind-753 The Early Bird Does Not Get The Worm

PRESENTER: **Marco Bertoni**
AUTHORS: Francesca Meli, Lorenzo Rocco

Getting enough sleep is a fundamental biological need. Extensive medical research has demonstrated the significant effects of sleep deprivation on physical health, mental conditions, and cognitive functioning (Cappuccio et al., 2010; Ferrie et al., 2011; Hale et al., 2020). Parallel to this, economic research highlights how inadequate sleep affects financial market returns (Kamstra et al., 2000), academic performance (Avery et al., 2022; Jagnani, 2024), and labor market outcomes (Gibson et al., 2018; Giuntella et al., 2019; Costa et al., 2020; Bessone et al., 2021; Kajitani et al., 2021; Costa, 2024). This body of research acknowledges sleep duration as a choice influenced by economic incentives (Biddle & Hamermesh, 1990) and addresses endogeneity concerns by leveraging variations in natural light at time-zone boundaries, changes in sunset timing, daylight-saving time, disruptions from household babies, and interventions like monetary incentives to promote sleep. However, even with randomized sleep allocation, the binding time budget constraint complicates identification. More sleep means less time for other activities, making it challenging to isolate the impact of sleep on economic outcomes. The effect of one more hour of sleep may partly be due to reduced work, leisure, or other activities, and ignoring the substitution of activities has significant implications. Eventually, different activities impact outcomes differently, so the benefits of increasing sleep depend on what activity is reduced. Thus, analysing sleep in isolation, without characteristing time substitutions, complicates interpretation of results. What can instead be identified are relative effects of time allocation across activities (Fiorini and Keane, 2014), and a way to isolate the impact of a specific time trade-off is to control for time allocated in all the activities but one. This enables to estimate the effect of an increase in the activity of interest relative to the omitted time use category, which necessarily decreases in substitution, holding all the other activities fixed. This paper contributes to the literature on the economic impacts of sleep by integrating techniques from time use research. We use complete time diary data from the American Time Use Survey (ATUS) to estimate sleep vs. non-work activities' effect on labor productivity, proxied by weekly earnings, while controlling for work time. We address time use endogeneity with longitudinal productivity data in a VA specification, comparing productivity of workers with similar characteristics, work hours, and lagged productivity, but different sleep durations. Our main results indicate that, once work time is held constant, trading sleep for non-work activities does not significantly affect earnings. Further results show that increased sleep leads to a smaller decrease in work hours compared to other activities. When not controlling for work time, sleep's unconditional effect on earnings is negative, due to a weighted average of zero substitution effect with non-work activities and a negative substitution effect with work. These findings highlight the negative bias in sleep's marginal effect estimates when work-time adjustments are free. They underscore the importance of considering substitution patterns in sleep impact studies, as relative effects vary based on substituted activities.

Ind-758 Illness and Income: Quantifying Long-Term Effects of 20 Prevalent Diseases in Denmark

PRESENTER: **Emily K Johnson**
AUTHORS: Angela Chang, Liza Sopina

0.1 Background

Comparative disease burden estimation is a longstanding topic of research in epidemiology, and health policymakers depend on comparative information to prioritize efforts across diseases towards those at greatest disadvantage. In health economics, similar comparative estimation of the economic burden of disease is useful to understand how different disease burdens affect personal and population level productivity. In this study, we compare the comparative long-term income losses experienced by individuals diagnosed with 20 of the most prevalent diseases across the population in Denmark. We seek to identify who is most affected by income loss due to incident disease, and whether different diseases show different gradients of income loss across socioeconomic and demographic stratifications.

0.2. Methods

We adopt a cohort study design using Danish register data to estimate the causal effect of disease incidence on income loss across 20 diseases in Denmark from 2000 to 2018. We match individuals with incident disease burden to a control population by age, sex, region, baseline income, employment status, baseline health, education history, household size, and relationship status and follow outcomes for 10 years following diagnosis or until censorship. For diseases with acute onset such as cancer or stroke, we match in the year before diagnosis, and for diseases that

present slowly over time such as depression we match to control 5 years before incident diagnosis. Personal and household equivalized income loss over the whole period is estimated for each disease, along with the mortality rate in each cohort. Results are stratified by age, employment status, education, and region in Denmark.

0.3 Results

Income loss over 10 years varies vastly by disease in Denmark. For example, breast cancer, stroke and depression have similar prevalence rates in Denmark, but average 10-year personal income losses per incident case in the working population total €10,130 (€9570 - €10,690) for breast cancer, €34,070 (€33,660 - €34,490) for stroke and €79,300 (€78,880 - €79,720) for depression. With most diseases, individuals with higher education and higher baseline income levels suffer greater income loss in absolute terms but smaller relative loss as a proportion of the control income with the same education and baseline income. Regional variation in income loss is different for each disease, despite the same national sick leave and disability policies available across the country for all diseases measured.

0.4 Interpretation

Just as healthcare needs differ for different diseases in a population, so do the economic protections necessary to mitigate illness-related income loss. Though matching estimation of income loss by disease cannot fully account for confounding which may differentially impact different disease estimates, a comparative accounting of total income loss is crucial information to inform health and economic policy. In Denmark, a subset of the 20 measured diseases produces outsized income loss across the population, and these conditions deserve special attention to protect individuals and bolster population-level economic output.

Ind-2078 Economic Burden of Breast Cancer in Chinese Women: Analysis from 2016 to 2018 Using National Health Insurance Data

PRESENTER: **Yumeng Lv**
AUTHORS: Li Yang, Yu Qi, Yaqun Fu

Background: Breast cancer is the fourth leading cause of cancer death globally, with about 665,684 related deaths in 2022, representing 15.4% of the total female cancer deaths. In China, there were 0.36 million new cases and 75,000 deaths due to breast cancer of women in 2022. Although some previous studies have reported the economic burden of breast cancer treatment among Chinese patients, few of them were based on multiple annual national-level claim data. **Objectives**: This study aimed to analyze the costs associated with female breast cancer patients in China using data from the China Health Insurance Research Association (CHIRA) and to explore the factors influencing total and out-of-pocket costs. **Methods**: Female breast cancer patients aged over 16 years were included in the CHIRA database between 2016 and 2018. CHIRA is a national sampling database that collects hospital claim records of patients covered by either the Urban Employee Basic Medical Insurance (EBMI) or the Urban and Rural Resident Basic Medical Insurance (RBMI). Descriptive, subgroup (age, insurance type, medical service type, and regions), and log-linear analyses were performed to assess breast cancer treatments. Statistical analyses were conducted using STATA 17.0 and Microsoft Excel. **Results**: This study analyzed 166,956 claims from 28,464 women from 2016 to 2018, with an average age of 54.49. Most (72.54%) were covered by EBMI, with 82.07% treated at tertiary hospitals. The analysis revealed significant differences by insurance type, hospital level, and region. The annual total median costs for patients covered by the RBMI and the EBMI were $2141.40 and $1716.87, with RBMI had a statistically significant higher out-of-pocket (OOP) ratios (48.83%) than EBMI patients (33.21%). Specialized hospitals had higher annual and OOP median costs ($1893.16 and $517.45) than general hospitals ($1819.90 and $517.45). Regionally, central China had the highest total and OOP costs ($2346.30 and $722.63), with lower financial burdens generally in eastern and western regions. Log-linear regression showed that outpatient costs decreased while inpatient costs rose from 2016 to 2018. For older patients, total outpatient costs tended to be higher, but OOP and inpatient costs declined. Insurance differences were evident, with employees showing higher inpatient costs but a lower outpatient OOP ratio, reflecting better financial protection under EBMI. Patients in secondary hospitals faced lower costs, suggesting advantages in seeking care at lower-level hospitals, though tertiary hospitals remained most used. **Conclusions**: The mean age of Chinese patients is significantly younger compared to those in other countries, while the costs of breast cancer patients in China exhibit significant regional and demographic differences. Although the national basic health insurance has significantly reduced the economic burden on patients, it has also introduced inequalities among different beneficiary groups. Efforts in expanding breast cancer screening are necessary to reduce the financial burden, and reallocating funding across regions and different levels of hospitals should be encouraged to address financial inequities. 2

Ind-2792 Cost-of-Illness of Diarrhoea and Pneumonia Among Children Under Five in Urban Slums, Non-Slums, and Rural Areas of Bangladesh

PRESENTER: **Md Zahid Hasan**
AUTHORS: Gatien de Broucker, Deborah Oidhi, Bryan Patenaude, Himel Das, Jasim Uddin, Sayem Ahmed, Zerin Zannat

Introduction: Diarrhoea and pneumonia continue to impose a substantial burden on public health, particularly among children under the age of five. Limited research exists on the economic impact of these disease in slum, non-slum, and rural areas of Bangladesh. This study presents a comprehensive analysis of the economic burden of treating diarrhoea and pneumonia diseases among children under-five in the urban slum, non-slum, and rural areas.

Methods: A cross-sectional study was conducted in 13 healthcare facilities in urban and rural areas of Bangladesh. An ingredient-based costing approach was applied to estimate the societal costs for one episode of pneumonia and diarrhoea in children under-five. To estimate the average costs per patient, a minimum of 30 caregivers of under five patients were planned to interview from each facility following the central limit theorem. Considering 10% non-response rate, around 534 patients were planned to be randomly selected for interview. However, an interviewer spent least 15 days in each facility to capture the required number of cases. If the number of cases were not fulfilled, the interviewer moved to the next facility. A total of 680 caregivers of pneumonia patients and 533 caregivers of diarrhoea patients were interviewed during the time frame. To estimate provider cost, health facility survey was conducted with the facility managers and relevant personnel e.g., medical staff,

accountant, and head assistants and relevant documents were reviewed. Data collection spanned from September 2021 to August 2022. Societal costs were estimated using the caregiver costs per patient and provider costs for treating a diarrhoea or pneumonia patient at public facilities. The incidence of catastrophic health expenditure (CHE) was estimated considering 10% and 25% income as thresholds. Statistical differences in costs and incidence of CHE were analysis using Kruskal Walis, Mann Witney U, and chi-square tests by different characteristics.

Results: The societal costs per patient were US$102.01 for pneumonia and US$40.67 for diarrhoea in non-slum areas, US$100.34 for pneumonia and US$37.37 for diarrhoea in slum areas, and US$58.50 for pneumonia and US$25.90 for diarrhoea in rural areas. The total caregiver costs of illness were significantly higher for pneumonia patients (p <0.001) in non-slum areas compared to the slum and rural areas. Despite having significantly lower cost-of-illness among slum residents, incidence of CHE resulting from cases of diarrhoea and pneumonia were significantly higher in slums, with nearly double the percentage of slum dwellers (100%, 36.8%) facing CHE as a result of inpatient episodes of pneumonia and diarrhoea, respectively, compared to rural residents (42.9%, 18.0%) and urban non-slum residents (57.1%, 17.7%).

Conclusion: The study provides a nuanced understanding of the economic impact of childhood diarrhoea and pneumonia in Bangladesh by different areas. The findings demonstrate significant economic burden borne by caregivers in treating diarrhoea and pneumonia among under-five patients. Understanding these costs is crucial for healthcare policy and resource allocation, emphasizing the need for large scale targeted interventions such as vaccination to alleviate the financial strain on affected households, even those that currently face lower costs of care.

10:30 AM –12:00 PM TUESDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Surabaya

Drugs, Tests and Vaccines

MODERATOR: **Jeffrey McCullough**, University of Michigan

Ind-266 Antibiotic Resistance, Drug Prices, and Entry

PRESENTER: **Miaoqing Jia**
AUTHOR: Ching-to Albert Ma

Antibiotic drug resistance is modeled by an increase in future drug cost (or equivalently a decrease in drug quality) due to current consumption. Competition in the medicine market leads to maximum consumption, and results in inefficiency. A single consumer cannot affect future drug cost, so might as well choose to consume; a free-riding, inefficient outcome. Drug plans with a centralized way to ration medicine can alleviate free riding. A monopoly will dampen the market failure because the monopolist internalizes cost increase. However, consumers may not benefit from a monopoly; prices remain high despite reduction of cost increase due to internalization. If innovation is possible, a potential entrant must consider competing with an incumbent upon entry. Under Cournot competition, entry deterrence occurs when the incumbent restricts consumption to reduce its own future cost so the entrant cannot earn enough post entry. Entry deterrence by the incumbent can happen; this results in lower drug consumption and reduces resistance. Entry accommodation may actually exacerbate drug resistance because the incumbent has less incentive to internalize the cost increase.

Ind-1596 Disinvestment in Pharmaceuticals: A Survey

PRESENTER: **Smriti Raichand**
AUTHORS: Bonny Parkinson, Gabriella Hirang, Alicia Norman

Background: Among health technologies, pharmaceutical costs are one of the largest contributors to healthcare expenditures. The expenditure on subsidised pharmaceuticals in Australia was $17 billion, about 16% of total government healthcare expenditure in 2022-23. However, spending in lower-income countries often amounts to a higher share of health spending relative to other services. With the changing pressures on healthcare budgets and increasing prices of new pharmaceuticals, countries have employed disinvestment strategies for pharmaceuticals. Disinvestment in healthcare refers to “judicious investment in new healthcare technology with strategies to reduce the unnecessary, ineffective, inefficient or harmful care”, i.e. low-value healthcare services. Following up to a previous publication, we anticipate that newer strategies might have replaced the ones described previously. Further, little is known about how countries with emerging health technology assessment (HTA) processes make disinvestment decisions for pharmaceuticals. **Aim:** This study will provide an update on a previous study to examine what has changed in terms of disinvestment for the countries with well-established HTA processes, and document and summarise how countries with emerging HTA processes make reimbursement and disinvestment decisions in pharmaceuticals. **Method:** We are currently surveying key experts from the HTA community from countries with established HTA processes (UK, France, Canada, Australia and New Zealand), and experts from the HTA community in countries with newly established and emerging HTA processes. Our survey questions are based on the framework described in published literature on disinvestment strategies in pharmaceuticals, enquiring on all aspects of these strategies. We will describe the findings narratively. We will also explore the international differences in disinvestment strategies. **Findings:** We will summarise updates to disinvestment strategies in the countries with established HTA processes and highlight the distinct, and sometimes ‘borrowed/ inspired/traditional’ methods of disinvesting in the countries where HTA processes have recently been introduced. **Conclusions**: The study will potentially benefit the policy makers, pharmaceutical companies and researchers globally. The findings of this study will provide an insight into currently used methods of disinvestment, and the pros and cons of the approaches. The study will also provide an update on a previous study investigating disinvestment strategies. These insights will help shape future research and policy decisions regarding investment in pharmaceuticals. The study will also provide useful examples for other countries considering disinvestment in pharmaceuticals.

Ind-1476 Stocking Under the Influence: Spillovers from Commercial Drug Coverage to Medicare Utilization

PRESENTER: **Emma Dean**
AUTHORS: Luca Maini, Josh Feng

Background

The U.S. health insurance market consists of both public and commercial segments, with physicians and facilities treating patients across both. Studies have documented “spillovers” from U.S. public to commercial segments, focusing on how policies governing the public side of the market affect competition and outcomes in the commercial market. However, the mechanisms driving spillovers from the commercial to public segments remain underexplored.

We highlight a novel channel of commercial-to-public spillovers, driven by outpatient facilities standardizing certain aspects of care across all patients. We focus specifically on physician-administered drugs, including infusions like chemotherapies. In public Medicare insurance, which is provided to all citizens over 65, nearly all physician-administered approved drugs are covered for enrollees. In contrast, patients with commercial insurance plans only have access to a restricted list of covered medications. Though not restricted by insurance coverage, access to medications for Medicare patients may still be limited by facilities, which determine the drugs stocked and made available to physicians. Facilities limit the number of drugs stocked to simplify inventory management and secure better pricing from manufacturers. Because these facilities serve both publicly and commercially insured patients, they may prioritize stocking drugs broadly covered by commercial insurance formularies.

Methods

To establish a causal link between Medicare drug utilization and commercial formulary exclusion rates, we employ a shift-share instrumental variables research design based on variation across U.S. states in exposure to commercial insurance plans. We utilize a 20% random sample of Medicare claims data to estimate state-level drug utilization in the Medicare program. We merge this with data on commercial insurance coverage of drug brands from MMIT Network Solutions, which tracks coverage of different drugs for all commercial insurance plans.XX% of individuals covered by commercial insurance are on a plan that uses a national formulary. We then use variation in state-level exposure to different commercial insurance plans to translate changes in commercial coverage into state-level changes in Medicare drug utilization.

We then provide evidence that facility stocking decisions serve as a key transmission mechanism for this spillover. By focusing on physicians who prescribe medications across multiple facilities, we use a design inspired by Finkelstein et al. (2021) to decompose prescribing variation into physician- and facility-driven factors.

Results

Our results show that a 10% higher exclusion rate from commercial formularies for a given brand results in a 3% lower utilization rate among Medicare beneficiaries. Facility-level factors account for 80% of prescribing variation for clinically similar medications, but less than 50% for physician-preference items. These findings suggest that facility stocking decisions are key in transmitting spillovers from commercial insurance coverage.

Significance

Our results suggest that commercial market inefficiencies can affect government spending and support the idea that facilities can directly influence quality of care. Our findings generalize to other insurance-distribution settings in health care where different entities make insurance and distribution decisions. The spillover we document is difficult to address through regulation and may diminish the impact of proposed Medicare payment changes

Ind-1404 How Uncertainty Affects Physicians' Decision-Making: Evidence From Coronary Stenosis Management in China

PRESENTER: **Chenzhou Wang**
AUTHOR: ZHANG YAN

Background* Inappropriate medical decision-making leading to the waste of resources is an important issue in health economics. Overuse exists and has raised concerns, making the public realize that more is not always better. Uncertainty, as a unique attribute of the medical field, poses a challenge in identifying overmedicalization. Although current research pays attention to uncertainty, there is less exploration into the relationship between uncertainty and physicians’ decision-making. Evidence shows that up to one-third of coronary stenosis treatment involve inappropriate percutaneous coronary intervention (PCI) surgeries and expensive high-level examinations, making it an appropriate scenario for studying the relationship between uncertainty and physicians’ decision-making.

Objective To explore the relationship between uncertainty and medical decision-making in the context of coronary artery stenosis treatment. The decisions here include treatment based on visual assessment of angiography results and additional testing. Treatment based on visual assessment can lead to unreasonable care, while additional testing incurs a significant cost.

Methods (1) **Design**: Retrospectively collect imaging data from 10 patients with varying degrees of stenosis who were admitted for coronary heart disease and underwent coronary angiography at a tertiary hospital in Wuhan, China, assuming all other conditions of the cases are identical. Use these 10 sets of imaging data as hypothetical cases to design a scenario simulation test tool. (2) **Survey**: Recruit eligible physicians from the cardiology department of a tertiary hospital in Wuhan to conduct ten trials, ultimately including 74 valid participants,

resulting in 740 valid observation samples. (3) **Data Analysis**: Use fixed-effects logistic regression to analyze the effect of the perceived uncertainty in the visual assessment of coronary angiography by the participating physicians on the decision to perform additional high-level tests (FFR). Further, use a threshold regression model to analyze the non-linear relationship of this effect.

Results In 740 observations, 300 (40.54%) chose to add FFR, while among the remaining decisions made based on visual assessment, 5.68% involved under-treatment, and 19.77% resulted in unnecessary PCI. The surveyed physicians tended to overestimate the degree of stenosis overall. The mean level of uncertainty was 15.92 (SD = 9.77). The fixed-effects logistic regression model shows a strong association, with a one-unit increase in uncertainty leading to a 98.7% increase in the odds of FFR decision-making (OR = 1.987, $P < 0.001$). There is a double-threshold effect between physicians' uncertainty and FFR decision-making. When the level of uncertainty is between 16.5 and 34.5, the effect is maximized ($\beta = 0.038$, $P < 0.001$).

Conclusion Uncertainty increases the probability of opting for additional high-level tests, with a double-threshold effect observed. Physicians performed more high-level tests, unnecessary PCIs, and under-treatment decisions for cases close to the decision benchmark (stenosis degree of 70%). After removing external stimuli, the primary reason for physicians making inappropriate medical decisions is estimation bias during the diagnostic process, while uncertainty leads to increased testing costs. For controlling overmedicalization, it is necessary to focus on borderline lesions, and there exists an uncertainty response threshold for reducing testing costs.

abs-os370 Domestic Volume-based Procurement and Foreign Market Expansion: An Analysis of Chinese Pharmaceutical Industry

PRESENTER: **ZHEN WANG**
AUTHORS: Fanghao Chen, Lai Yi

Since 2018, Chinese government has launched several rounds of national volume-based procurement (NVBP) to cut prices and increase the accessibility of drugs for patients. While most literature are confined to the effects NVBP caused onto the domestic market, little is known about how firms respond to NVBP in the foreign markets. Combining firm-level data on NVBP and overseas foreign direct investment (OFDI) decisions, and adopting a generalized difference-in-differences (DID) design, we find that the affected firms responded strategically by increasing their overseas projects. The effects are more pronounced among private firms and firms more specialized in developing innovator drugs. Our findings suggest that NVBP acts not only as a cost-containment measure but also as a catalyst for pharmaceutical firms' international expansion, advocating for a nuanced understanding of policy interplays in international business dynamics.

Ind-2749 Comparative Analysis of the Economic Impact of Substandard Uterotonics on Post-Partum Hemorrhage & Maternal Mortality in Ghana, Nigeria, and Senegal

PRESENTER: **Sachiko Ozawa**, University of North Carolina at Chapel Hill
AUTHORS: Lester Chinery, Metin Gülmezoglu, Colleen Higgins, Ashley Yi-Fang Lee, Sara Rushwan, Petra Proctor

Background: Uterotonic medications, such as oxytocin and misoprostol, are vital in preventing postpartum hemorrhage (PPH), a leading cause of maternal mortality. However, in many low- and middle-income countries, substandard uterotonics undermine their effectiveness, posing significant health and economic challenges. Uterotonics have found to have some of the highest failure rates in quality testing among essential medicines. This study examines the implications of poor-quality uterotonics in three West African countries: Ghana, Nigeria, and Senegal.

Methods: A decision-tree model was developed to simulate the outcomes of substandard uterotonic use, including PPH incidence and associated economic costs, across 100,000 births in each country. The model incorporated country-specific data on delivery settings, uterotonic quality and usage, and maternal health outcomes. Data were derived from Demographic and Health Surveys and existing literature. The prevalence of substandard oxytocin and misoprostol was modeled across healthcare facilities in each country. National-level projections were calculated based on population size.

Results: Ghana demonstrated the greatest potential benefits from improving uterotonic quality, with annual cost savings of $2 million (13%) and 2,200 PPH cases (11%) avoided per 100,000 births. In Nigeria, cost savings were estimated at $1.1 million (7%), with 944 PPH cases (4%) avoided per 100,000 births. Senegal showed annual cost savings of $224,000 (7%) and 875 PPH cases (6%) avoided per 100,000 births. When scaled to national populations, improving uterotonic quality could result in annual savings of $89 million in Nigeria, $18.8 million in Ghana, and $1.3 million in Senegal, with 100,000 fewer PPH cases collectively. Key drivers of these outcomes included high levels of facility-based deliveries and poor uterotonic quality in Ghana, a high proportion of home births in Nigeria, and use of substandard misoprostol in Senegal.

Conclusions: Improving uterotonic quality offers significant economic and health benefits across the three countries. The greatest impact may be achieved through country-specific strategies: enhancing quality assurance in healthcare facilities in Ghana, increasing access to high-quality uterotonics and reducing home births in Nigeria, and addressing misoprostol quality issues in Senegal. Ensuring the quality of uterotonics not only reduces maternal mortality but also supports efforts toward Universal Health Coverage by improving medicine access and equity.

Ind-1882 Evidence use in the Decision-making Stages for Vaccine Introduction and Roll-out in Kenya's Public Health Sector

PRESENTER: **Dennis Wambiri Waithaka**, KEMRI-Wellcome Trust Research Programme/ Open University
AUTHORS: Jacinta Nzinga, Simon Lewin, Benjamin Tsofa, Edwine Barasa, Unni Gopinathan

Background: Most low-and middle-income countries (LMICs) have established technical advisory bodies to assist policymakers in making evidence-informed decisions on introducing and/or implementing new health programmes and commodities including vaccines. However, we know little about how policymakers and their technical advisory bodies contextualise and use global guidance documents and evidence as well as how they elicit and use local evidence, including the knowledge of stakeholders such as civil society groups, which is key in centring people

during policymaking processes for sustainable health systems in LMICs. **Objectives:** To investigate how health system policymakers and their technical advisory bodies use global and local evidence and include stakeholders in decision-making processes for the introduction and roll-out of HPV and malaria vaccines at the national level in Kenya. **Methods**: We employed a qualitative multiple case study design. Data were collected through document review (n=52), observations, and in-depth interviews of national and county level government officials, and other stakeholders such as partners and local civil society organisations (n=30). Modified framework analysis was used to analyse data and generate findings. **Results:** The World Health Organization's (WHO) global guidance and Ministry of Health (MOH) *programmatic data* were the most used explicit evidence. These two sources of evidence were perceived by decision-makers within the National Vaccines and Immunisation Programme's officials as legitimate sources of sufficient and readily available evidence to inform health systems and policy decisions. The consistent involvement of WHO and MOH officials in these decision spaces allowed them to easily share the information required to inform decisions. In contrast, the use of *local primary research findings* largely occurred when imposed by donors as part of funding requirements, and when non-government actors represented in the decision-making process had earlier on conducted research specifically to inform these decisions. *Local tacit evidence* from the MOH and partners involved in the decision-making was used largely to interpret and contextualise WHO guidance documents. Specifically, these actors used their local contextual and programmatic knowledge and experiences to make broad WHO recommendations relevant to local needs. **Conclusions**: While both global and local evidence can play key roles in informing decisions on implementing health interventions, the range of stakeholders represented in these decision-making spaces influences the diversity of global and local evidence that is available. Wider stakeholder involvement, including civil society is key in centring people in the policy making process for building fair and just health systems in LMICs.

Ind-517 Traditional Vaccine Platforms: Lessons Learned from the COVID-19 Pandemic

PRESENTER: **Veronica Vargas**, Universidad Alberto Hurtado

Abstract **Background:**The COVID-19 pandemic catalyzed unprecedented vaccine development, with traditional platforms, including inactivated and protein subunit vaccines, relying on established, non-genetic technologies, and modern platforms, such as mRNA and viral vector vaccines. Inactivated and protein subunit vaccines—often more affordable and accessible—were fundamental, particularly in low- and middle-income countries. Inactivated vaccines developed in China and India accounted for 42% of global deployment, compared to 33% for mRNA and 25% for viral vector vaccines. Despite extensive research and development, protein subunit vaccines experienced limited global rollout..**Objectives:** Analyze the R&D and authorization timeline (domestic and WHO) of inactivated and protein subunit COVID-19 vaccines from 2020 to 2024, identifying how funding, partnerships, and scientific evidence influenced approvals to guide future policy and innovation.**Methods:**We conducted a systematic literature review and statistical analysis of all authorized COVID-19 vaccines by national authorities and World Health Organization Emergency Use Listing (WHO-EUL) in the period 2020–2025. Variables analyzed included country of origin, technology, authorization timelines, partnership scope, and funding source (e.g., public, public-private, international) and scientific evidence supporting clinical and real-world data. **Results:** From July 2020 to March 2024, 28 traditional vaccines (39% inactivated, 61% protein-based) gained national domestic approval, mainly in Asia, the Middle East, and the Americas. Inactivated vaccines, led by domestic partnerships in China and India, were approved earlier (May 2021) than protein-based vaccines (February 2022), using more clinical and real-world studies. Only one-third achieved WHO EUL, with international partnerships boosting EUL likelihood (Spearman's $\rho = 0.5812$, $p = 0.0015$ **). Domestic funding drove inactivated vaccines. IP/manufacturing barriers delayed protein-based vaccines.**Conclusion:**Although mRNA vaccines dominated global attention during the COVID-19 pandemic, traditional platforms—particularly inactivated vaccines—played a vital role, especially in low- and middle-income countries. In countries like China and India, state-led initiatives facilitated the rapid domestic approval and rollout of these vaccines. In contrast, protein subunit vaccines, which pursued international distribution via the WHO Emergency Use Listing, faced significant delays. These delays were largely due to the complexities of multi-partner agreements, particularly around intellectual property and manufacturing capacity. However, Cuba's centralized and vertically integrated vaccine infrastructure proved to be an exception, enabling earlier development and deployment. To ensure equitable global access, WHO should streamline the EUL process, harmonizing IP policies across platforms such as the WHO's Technology Access Pool, the U.S. NIH, and academic institutions to accelerate vaccine availability.

Ind-989 What Role Does Equity Play in Australia's HTA processes? A Review of the Pharmaceutical Benefit Advisory Committee Recommendations Regarding Vaccines

PRESENTER: **Ms. Marie-Anne Boujaoude**

AUTHORS: Natalie Carvalho, Kim Dalziel, Mackenzie Bourke, Nancy Devlin

Background and Objective: PBAC makes recommendations to government on which vaccines to include in the National Immunisation Program. Vaccines can have important benefits in terms of reducing health inequalities, which produces benefit to society. It has been argued that these benefits are not adequately accounted for in evidence and decision-making. This study aimed at determining if and how equity is considered in the PBAC evaluation of vaccines.

Methods: A comprehensive evaluation of each vaccine including economic evaluation, financial implications, and other criteria, are published in Public Summary Documents (PSDs). All PBAC PSDs evaluating vaccines were reviewed. An Excel-based equity-focused framework for data extraction was developed through a literature review and included: (1) general variables containing details on the vaccine and economic evaluation, (2) equity specific variables reflecting equity dimensions and any equity-informative methods used.

Results: 70 PSDs from 2005 to 2024 capturing 37 vaccines were included. The equity relevant dimensions commonly mentioned within the documents were presence of comorbidities (48%), Indigenous status (38%), gender (19%), parental status (4%), geographic location (3%), socioeconomic status (1%) and refugee status (1%). Fewer equity-relevant dimensions were incorporated in the final PBAC recommendations and proposed listing of the vaccines. An even smaller number of evaluations included equity dimensions explicitly within the analysis. Subgroup analysis (40% of PSDs) was the only method used showing distributional concerns. There was no evidence of any equity-informative economic evaluation used.

Discussion: Although specific groups (ex: Indigenous adults) were targeted in the evaluations and/or recommendations, equity-informative

economic evaluation evidence supporting these decisions was scarce. In some cases, a description of health inequity was presented through subgroup analysis. However, equity in the distribution of health and opportunity costs was not included. Equity informative economic evaluation methods offer a way of strengthening this aspect of PBAC decisions and could offer lessons to other settings.

Ind-225 Optimal Pricing of Diagnostic Tests: How Much Money to Compensate for the Incurability of a Disease

PRESENTER: **Bruno Ventelou**, CNRS - Aix Marseille Univ
AUTHOR: antoine lacombe

Objectives – When it comes to patients' decision to undergo testing, two characteristics are involved in the decision to take test for a given disease: the "transmissible" nature of a disease, which will push the patient to be screened/tested to avoid being a vector of the disease in those around them (prosocial motive), and its "curable" nature, which will give the patient personal motivation for screening/testing (individual benefit).

Methods - We conducted an online survey on a representative sample of the French population in September 2021 (n=1017). Using a contingent valuation methodology, we studied the impact of these two characteristics on the propensity to be screened and tested (for the case of a disabling respiratory disease). We applied a two-part model to account for a partition of the population in our data between absolute refusal screening and screening hesitancy. We sought to estimate the effect of the two characteristics on the "willingness to pay" for tests and to quantify precisely how (much) the incurable nature of a disease could be a disincentive to screening/testing.

Results –We determined that the optimal subsidy to compensate for the incurability of an illness must decrease the price of the test by 39% (95% CI: [28.42%;52.11%]). This figure can be studied for different population strata (gender, age, level of income, health status etc.) and, due to the parallel collection of behavioural data, for different psychological profiles of people (risk aversion, cooperativeness, and trust-in-science, etc.).

Discussion - The behaviour of access to care and in particular of diagnostic tests utilisation is decisive for the success of epidemic prevention and control strategies (the famous test and treat policies). Even in the absence of current treatments, early detection may facilitate proactive measures, emphasizing the need for optimal pricing strategies to promote the adoption of tests. This study brings new insights on that topic.

10:30 AM –12:00 PM TUESDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Lotus

Public Insurance for Vulnerable Populations: Access and Utilization

MODERATOR: **Damien de Walque**,

Ind-1225 Public Health Insurance and Healthcare Utilisation Decisions of Young Adults

PRESENTER: **Muhammad Fikru Rizal**

Background: Low- and middle-income countries (LMICs) are home to 90% of the world's young adult population, who face higher morbidity and mortality risks compared to their counterparts in higher-income countries, yet have poorer access to healthcare services. To address these issues, LMICs are expanding public health insurance coverage, commonly through fully subsidised schemes for the poor and contributory mechanisms for the non-poor. While the impact of public health insurance on healthcare access in these settings is relatively well-studied, research has generally focused on subsidised schemes, and studies specifically targeting young adults are lacking. Inadequate medical treatment for this population may lead to long-term health and economic consequences.

Objective: This paper examines how non-subsidised public health insurance coverage affects the health and healthcare-seeking decisions of young adults in Indonesia.

Methods: The study exploits a sharp change in insurance coverage caused by an age-eligibility rule within Indonesia's National Health Insurance (NHI) programme, which states that individuals older than 21 are no longer covered by their parents' employer-sponsored, non-subsidised NHI scheme. A regression discontinuity design (RDD) is used to estimate the impact on health-seeking behaviours and health outcomes among young adults aged 19 to 23. Data are drawn from two sources: (1) the NHI sample dataset containing 1.7 million individuals representative of all NHI enrolees by the end of December 2018, and (2) the 2018 wave of the Indonesia National Socioeconomic Survey (Susenas), a nationally representative household survey of 1 million respondents.

Results: The age-eligibility rule caused a sudden 14.6 percentage point reduction in NHI coverage among young adults. While this sharp change does not affect self-reported health status, significant impacts on healthcare-seeking decisions are observed. Among those reporting illness in the past month, the age cut-off abruptly reduces the probability of an outpatient visit by 5.3 percentage points. This reduction is mainly driven by decreased utilisation of primary care services rather than specialist or hospital outpatient visits. The age limit also leads to substitution in treatment-seeking behaviour, increasing the likelihood of self-treatment and the use of traditional healers. Further analysis suggests that the age threshold has larger impacts on healthcare-seeking decisions among individuals who are poorer, less educated, and those living in regions with above-median average outpatient costs.

Conclusions: This is the first study to document the effects of a dependent coverage age-eligibility rule on young adults in Indonesia. The findings suggest that the government's efforts to increase insurance uptake among the young population should target young adults who were

previously insured through their parents' coverage, with a particular focus on the relatively poor and less educated subgroups. Policymakers should also anticipate additional costs incurred by increased NHI uptake on this cohort's healthcare service utilisation.

Ind-2462 Impact of Long-term Care Insurance on Healthcare Utilization and Expenditures: Evidence Using an Insurance Claim Dataset in City A, China

PRESENTER: **Xiaoyu Wang**
AUTHORS: Yunting Zheng, Min Chen, Yanming Lin

Background: The effects of long-term care insurance (LTCI) on healthcare utilization and expenditures in developing countries is limited, and existing findings remain inconclusive. Previous studies have identified both a "release effect" and a "substitute effect" of LTCI on health service use and costs. City A, one of 49 LTCI pilot sites in China, known for its dynamic private sector and strong philanthropic culture, launched a distinct LTCI program in August 2020 to address the challenges posed by a rapidly aging population. This study aims to assess impacts of LTCI on healthcare utilization and expenditures. **Methods:** This study analyzed outpatient and inpatient medical insurance claim data from 4,624 individuals covered by urban employee basic medical insurance between 2018 and 2023 in City A. LTCI eligibility required a disability assessment, eligible disabled enrollees received LTCI benefits in a staggered manner. To address potential biases in traditional two-way fixed effects (TWFE) methods for estimating causal effects in staggered implementations, we applied an updated staggered Difference-in-Differences (DID) approach, accounting for treatment effect variations by calendar time, entry cohorts, and exposure length, allowing for a precise estimation of the LTCI's impact on healthcare utilization and expenditures. Patients who completed disability assessments were defined as the treatment group (1,020 individuals), with the assessment completion date marking the start of their LTCI benefits. **Results:** The average annual hospitalization cost is 22,000 yuan, and the average quarterly outpatient cost is 740 yuan. The baseline regression results show that, aside from a significant decrease in outpatient visits, there was no notable reduction in inpatient admissions or medical expenses. According to the staggered DID analysis, after the introduction of LTCI, patients with LTCI coverage experienced a sustained reduction in hospital admissions compared to those without coverage, with annual hospital admissions decreasing by 0.8 visits. In the first year of LTCI benefits, inpatient expenses and out-of-pocket costs for inpatient care increased by 30.1% and 29.6%, respectively, with no significant changes observed thereafter. Outpatient visits also showed a sustained decrease beginning four quarters post-implementation, ranging from 0.4 to 1.0 visit per quarter. Additionally, quarterly outpatient expenditures decreased by approximately 15% starting in the third quarter. However, changes in patients' out-of-pocket costs for outpatient services were not statistically significant, likely due to the deductible threshold in outpatient reimbursement policies. **Conclusions:** The implementation of LTCI in city A initially increased inpatient expenditures and out-of-pocket costs, likely due to a release effect. However, in long-run, it may reduce hospital admissions and outpatient visits through a substitution effect, with unsignificant impact observed on healthcare expenditures. This study underscores the importance of adequately preparing medical insurance funds at the outset of LTCI implementation and establishing a robust supply system for long-term care to meet healthcare needs. These insights are essential for policymakers considering LTCI in developing contexts, highlighting the need for a balanced approach that addresses both immediate and long-term impacts on healthcare utilization and spending.

Ind-2627 The Impact of Indonesia's National Health Insurance (JKN) on Healthcare Utilization Among the Elderly: A Decade of Implementation

PRESENTER: **Mr. Antokalina Sari Verdiana**
AUTHORS: Rizal Mansur, Mitha Cerinda, Yenny Yenny, Fentya Yumna Cahyani, Mr. Benjamin Saut Parulian Simanjuntak, Mahlil Ruby

Background: Indonesia is entering an aging population phase, with the elderly (aged 60+) comprising more than 7% of the total population by 2023. This demographic shift presents significant challenges for the healthcare system, particularly in ensuring equitable access to healthcare services for the elderly. The introduction of Sustainable Development Goal (SDG) 3.8, supported by the National Health Insurance (*Jaminan Kesehatan Nasional*/JKN) program, aims to improve healthcare access. With 98% of the population now enrolled, JKN's decade-long implementation provides a unique opportunity to evaluate its impact on healthcare utilization among the elderly. **Methodology:** This study analyzed data from Susenas 2013 and 2023, focusing on individuals aged 60 and older (95,464 respondents in 2013 and 129,234 respondents in 2023). Using the Andersen Behavioral Model, predisposing (age, gender, marital status, education), enabling (urban/rural residence, internet access, asset index), and need factors (health complaints, disruptive conditions) were examined. Logistic regression was employed to assess the factors influencing healthcare utilization in insured populations. Propensity Score Matching (PSM) with nearest neighbor matching (caliper 0.05) was used to reduce bias between insured and uninsured groups, followed by Difference-in-Differences (DID) analysis to evaluate JKN's impact over the decade. Additionally, the Concentration Index (CI) was calculated to analyze inequality in healthcare utilization based on asset index for 2013 and 2023. **Results:** The study revealed significant changes in factors influencing JKN participation between 2013 and 2023. Education's influence on insurance ownership increased from 16.22% to 23.72%, and urban residency's impact rose from 11.14% to 46.93%. Internet access, while still significant, saw a decline from 40.82% to 34.94%, and the influence of health complaints decreased from 22.56% to 12.47%. Matching results showed that in 2013, the ATT was 1.86% and not statistically significant, indicating minimal impact of insurance ownership on healthcare utilization before JKN. By 2023, the ATT increased to 7.71% and was statistically significant, highlighting JKN's role in improving healthcare access for the elderly. The DID analysis demonstrated a 5.85% increase in the probability of healthcare utilization attributable to JKN implementation. The CI for healthcare utilization based on asset index was 0.065 in 2013 and decreased to 0.041 in 2023, indicating reduced inequality in access to healthcare between wealthier and poorer groups after JKN's implementation. **Conclusion:** The JKN program positively impacted healthcare utilization among the elderly, improving access and reducing inequalities. The 5.85% increase in healthcare utilization probability and the reduction in Concentration Index (0.065 to 0.041) demonstrate JKN's success in addressing financial and structural barriers. However, to maximize its impact, regional governments should focus on enhancing healthcare accessibility for elderly populations, particularly in underserved areas and eliminating remaining financial barriers. Policies should prioritize expanding quality healthcare services in rural and lower-income areas while promoting awareness and utilization of JKN among the elderly. These measures can further strengthen the program's effectiveness and ensure equitable healthcare access for Indonesia's aging population.

Ind-1526 Urban-rural Critical Illness Insurance and Forgone Healthcare Utilization

PRESENTER: **Jiyuan Wang**
AUTHORS: Ya Gao, Yi Zhang

Over the past decades, many countries have invested heavily in expanding public health coverage and improving access to healthcare. In China, near-universal coverage of basic public medical insurance has been achieved. To further protect vulnerable households from catastrophic health expenditures, China introduced Critical Medical Insurance (CMI) as a supplementary scheme to its basic resident medical insurance. While CMI aims to reduce forgone care by alleviating out-of-pocket expenses, concerns about potential moral hazard persist, and its effectiveness, particularly in reducing forgone healthcare, remains unclear. This study examines the impact of CMI implementation on forgone healthcare, leveraging a staggered policy rollout that began in 2012. Unlike previous studies that primarily focus on insurance expansions for risk reduction or welfare improvement, this research evaluates a unique supplementary insurance scheme, offering insights for public health policy design. Our analysis employ a difference-in-differences (DID) approach with data from the 2011–2015 China Health and Retirement Longitudinal Study (CHARLS), CMI implementation timelines from government websites, and city-level socio-economic data from the *China City Statistical Yearbook*. These datasets allow us to compare cities with different CMI adoption dates while accounting for local development trends. Our findings indicate that exposure to CMI reform reduces the probability of forgoing inpatient care by 1 percentage point (pp) and outpatient care by 2 pp—approximately 20% reductions relative to baseline rates of 5.6% and 10.4%, respectively. Notably, CMI reform primarily reduces the likelihood of forgoing inpatient care due to financial constraints, suggesting that CMI effectively alleviates disease-induced financial burdens. An event study analysis further reveals that the reduction in forgone inpatient care persists for up to four years after the reform. These results remain robust across different estimation methods. Additionally, we find that the effects are more pronounced among households with non-agricultural *hukou*, females, and individuals with higher baseline health risks. Regarding mechanisms, we find no evidence of overtreatment or moral hazard but observe improved health outcomes and more cost-effective use of healthcare services. These findings suggest that CMI not only improves healthcare access but also enhances the efficiency of healthcare utilization by reducing financial barriers without encouraging excessive medical consumption. In summary, this study highlights the crucial role of supplementary insurance in addressing unmet healthcare needs among vulnerable populations. By alleviating financial constraints and promoting cost-effective care, CMI contributes to a more equitable and sustainable healthcare system, providing valuable insights for future policy design.

abs-os256 Achieving UHC with Disability Inclusion in Indonesia: A Mixed-Method Study to Explore People with Disability's Access to Healthcare

PRESENTER: **Relmbuss Biljers Fanda**
AUTHORS: Shita Listyadewi, Ardhina Nugraheni, Retna Siwi Padmawati, Tri Muhartini, Muhamad Faozi Kurniawan, Ika Septiana Eryani

Background: In Indonesia, universal health coverage called *Jaminan Kesehatan Nasional*, or the JKN, has promised free access to healthcare for everyone, including people with disabilities, since 2014. However, little is known about the health-seeking behaviours of these individuals, particularly their use of this JKN scheme. This convergent mixed-method study explored the JKN coverage rate for people with disabilities and their use of the JKN.

Method: For the qualitative component, we interviewed participants from national, provincial, and district governments, primary health centres (PHCs), and associations for people with disabilities. We conducted a total of 19 focus group discussions with 167 participants. For the quantitative component, we carried out a household survey involving 2,666 individuals with physical and sensory disabilities across three provinces and six districts: the Special Region of Yogyakarta (Yogyakarta Urban and Bantul districts), Bali (Denpasar and Buleleng districts), and East Nusa Tenggara (Kupang Urban and Kupang Rural districts). Descriptive, bivariate, and logistic regression analyses were performed to examine JKN utilisation among individuals with disabilities experiencing illness symptoms within the past year. We integrated the findings by triangulating the quantitative data with qualitative insights.

Results: The JKN insurance coverage rate for all survey respondents was 89%. Around 85 % of the population received premium subsidies because they were coming from families with limited income. The national, provincial and district governments have made multiple efforts to ensure that all people with disabilities are enrolled in JKN, such as providing population data and paying their premiums. Those who are not insured reported that they had a lack of information on the registration process (46%), financial constraints (18%), and a preference to remain uninsured (9%). Regarding health-seeking behaviour, although 35% of them have utilised the JKN when looking for a health service, others (65%) did not use it. Even more concerning, 7 % of the population who needed health services lived without any needed treatment. In addition, our logistic regression showed that the respondents tended to use the JKN if they were self-employed, had guardians, visited primary health centres and visited hospitals. In terms of out-of-pocket payments, variations in the health service costs ranged from 0.05 to 103 times the daily minimum wage, which can be catastrophic for these individuals. In our interviews, participants mentioned that the JKN scheme only covers a partial health benefits package, including medications in hospitals. In another case, they had to pay since their JKN registration status was inactive. Their premiums were not paid because they were excluded from the list of the JKN participant groups that received a premium subsidy.

Conclusion: Although Indonesia has succeeded in ensuring high coverage of all individuals with physical and sensory disabilities registered in the JKN program, these individuals still tend not to utilise it when needed. To prevent catastrophic payments in this community, the Indonesian government should expand healthcare design to achieve universal health coverage by increasing the JKN benefit package in the hospital and maintaining their activated status.

os176 Bali International Convention Centre – Magnolia

Dietary Behavior of Children and Adolescents: Evidence from Behavioral Experiments in Indonesia and Vietnam

MODERATOR: **Igna Bonfrer**, Erasmus School of Health Policy & Management

CONVENER: **Robert Sparrow**, Wageningen University

DISCUSSANT: **Hien Nguyen**, Erasmus University Rotterdam; **Puguh Prasetyoputra**, National Research and Innovation Agency; **Tri Mulyaningsih**, Universitas Sebelas Maret

abs-os393 Adolescent Girls, Agency and Appetite: Evidence from a Food Voucher Experiment

PRESENTER: **Ms. Tri Mulyaningsih**

AUTHORS: Mr. Robert Sparrow, Matthias Rieger, Amalina Shabrina

Nutrition during adolescence is increasingly recognized as a key to a healthy and productive life for women and their children. Nutrition policies and advocacy in the Global South have traditionally focused on mothers and their children under five years of age, because the first years of life are often characterized by growth faltering and stunting, offering a “first window of opportunity” for interventions. However, there is a “second window of opportunity” that is particularly relevant for adolescent girls as the growth velocity is intense again. This second window is behaviorally complex as girls undergo important cognitive and emotional changes. We explore the role of agency in improving nutritional behavior among adolescent girls in Indonesia, by testing the effectiveness of food vouchers in altering dietary behavior, leveraging agency to enhance outcomes. We hypothesize that food vouchers can encourage healthier eating habits and that agency — exercised through choice — improves the efficacy of interventions, as agency may foster patience and goal-oriented decision-making, critical for adopting healthier diets. We test this with a randomized controlled trial involving 1,011 girls aged 12-16 in Solo, Indonesia. We compare three groups: a group with restricted vouchers for healthy foods (paternalistic treatment), a group with vouchers offering a choice between healthy and unhealthy options (agency treatment), and a control group receiving vouchers for stationery. The choice (in the agency treatment) was made salient through information on healthy diets, provided to all groups. Vouchers were personalized and handed out over three weeks (2 times a week), and could be redeemed at food stalls on school grounds. Baseline and follow-up surveys track food choices and preferences, complemented by food diaries and anthropometric measurements. We find that the healthy (restricted) and the choice (agency) vouchers reduced consumption of the number of unhealthy food items relative to the control group, but the treatment effects of both food vouchers were statistically equivalent. There were no statistically significant effects of either voucher on the primary outcome variable (a free healthy versus unhealthy meal choice in a controlled setting), suggesting that preferences were on average unaffected by our short-term intervention. But we do observe substantial heterogeneity by age, as the choice voucher increased healthy meal choice by a third (relative to the restricted voucher) for the youngest half of the sample, but there is no statistically significant effect for the older group. There was also qualitative evidence that effects vary across schools and BMI status. Our findings contribute to the literature by demonstrating the role of agency in shaping dietary preferences and behaviors.

abs-os414 Information Provision, Research Participation, and Altruism: Evidence From a Field Experiment

PRESENTER: **Hien Nguyen**

Research participants are often neglected in the process of sharing research findings and do not receive detailed information stemming from the research data to which they contributed. Although there is qualitative evidence on the effects of sharing research findings with participants, there is very little experimental evidence in the economics domain. We are among the first in the literature to develop and implement a field experiment that randomized the provision of different types of research findings involving 1,734 research participants. In one experimental condition, treated parents received general findings from the child health and nutrition literature and in another experimental condition treated parents received general research findings plus personalized research findings from the survey they completed. In the context of research related to the health and nutrition perceptions of parents and their children in Vietnam, we estimated the effects of sharing these research findings on knowledge, research uptake, perception of research usefulness, and willingness to support research. For example, we estimated the impacts of sharing research findings on donations to fund a follow-up study and to disseminate research findings via controlled and incentivized dictator games. Our results show that participants who received research findings–especially coupled with personalized survey data–donated more money to fund a follow-up study and to disseminate the research findings. We interpret these results within the qualitative literature on research participation in the health domain. One implication of our results is that policies to share research findings with research participants may increase support for future scientific investigations and broader dissemination of scientific findings, which may promote scientific discoveries and progress.

abs-os398 Interpretive Nutrition Labels, Parent-Child Interactions, and Food Choices in Indonesia

PRESENTER: **Margarita de Vries Mecheva**

AUTHORS: Mr. Robert Sparrow, Matthias Rieger, Mr. Puguh Prasetyoputra, Rika Rachmalina

Diets in many countries in the Global South are moving towards more processed, unhealthy foods. One popular policy response to tackle the growing consumption of unhealthy food in the Global North has been the introduction of interpretive nutrition labels. Experimental evidence from the Global South and contexts undergoing a nutrition transition remains scant. We conduct a series of lab-in-the-field experiments with parents and children in public primary schools in Bogor, Indonesia (n = 900 parent-child dyads). We use an online experimental supermarket

(for parents) and a table with snacks and drinks (for children) to investigate if a nudge in the form of "traffic lights" labels (green "Healthier choice", yellow "OK choice", red "Less healthy choice") may potentially improve the healthiness of parents' and children's food and snack consumption. In post-experimental surveys we explore the participants' perceptions of the nutrition labels and motivation of choosing the foods/snacks. We also record whether a parent approves/disapproves the snack choice of her child and whether a child accepts/rejects it. We compare the proportions of healthy/unhealthy foods and snacks chosen by the participants in treatment ("traffic lights" labels) and control (no labels) groups.

abs-os405 Sharing Research Results and Correcting Nutritional Perceptions and Behavior: Evidence From a Field Experiment

PRESENTER: **Hien Nguyen**

To contribute to the scarce literature on the effects of sharing research results with study participants, we conducted an RCT in which parents received research data and findings about childhood obesity and healthy lifestyles through virtual workshops, videos, and written reports. The primary goal of this information intervention was to empower parents with an updated information set to achieve more accurate perceptions about their child's weight status, diets, and exercise levels. A total of 1,734 parents were randomly assigned to three groups: (1) a control group; (2) a treatment group receiving general research findings from the child health and nutrition literature plus aggregate data from our baseline survey; and (3) a treatment group receiving general research findings from the child health and nutrition literature, aggregate data from our baseline survey, and personalized data from our baseline survey. Our findings indicate that the receipt of research information, especially personalized survey data, led to improvements in both perceptions and behaviors after about 1 month. Treated parents receiving personalized research data and findings were more likely to correctly categorize their child's weight status, declare that they would like their child to be at a healthy weight, and express more accurate assessments regarding their child's food consumption and exercise levels. Moreover, treated parents receiving personalized information also reported increases in their child's consumption of healthy foods and physical activity levels. We find that these improvements in perceptions and behaviors were partly driven by increases in concerns about their child's weight status, with treated parents who received personalized research data and findings being more likely to express concern about their child eating too much unhealthy food and needing to change their diet to maintain a desirable weight, being overweight as an adult, and developing diabetes and cancer later in life. Overall, our findings indicate that, compared with traditional modes of information provision, personalized research findings sourced from the participants themselves may be one potential solution to improve health perceptions and behaviors in the short term.

10:30 AM –12:00 PM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

os187 Bali International Convention Centre – Karangasem

Bridging the Gap Between R and Excel for Health Economic Modelling

MODERATOR: **Aaron Winn**, University of Illinois at Chicago

CONVENER: **Howard Thom**, University of Bristol

DISCUSSANT: **Rob Smith**, Dark Peak Analytics; **Yun-Ting Wang**, Clifton Insight

abs-os432 AssertHE: An R Package to Improve Quality Assurance of HTA Models

PRESENTER: **Mr. Rob Smith**

Summary: The growing use of health economic models to inform resource allocation in healthcare underscores the need for rigorous quality assurance processes to ensure model reliability and robustness. Traditional approaches to quality assurance rely on both technical and non-technical experts manually reviewing various model components, which can be time-consuming and resource-intensive. This process often requires an extensive understanding of how model components interact, and it is sometimes not feasible to thoroughly test each part within available timeframes. Addressing this gap, we introduce the *assertHE* package, an open-source tool for the R programming environment aimed at enhancing the quality assurance of health economic models.

Methods: The *assertHE* package offers a suite of testing functionalities that can be integrated directly into the health economic model development workflow. The package features multiple automated checks designed to reduce the likelihood of common modelling errors, aiding both model builders and reviewers. Additionally, *assertHE* includes functions that allow users to explore the network of R functions within a model, detailing where each function is defined, if and where it has been tested, and the test coverage of tested functions. An added feature is the package's ability to generate summaries of functions using a Generative Pretrained Transformer Large Language Model (LLM), providing a clear overview of complex model components.

Results: We applied the *assertHE* package to three open-source health economic models built in R, demonstrating its application in real-world settings. This use case involved embedding assertHE's check functions within model code to automate error detection, as well as using its visualisation capabilities to map the interconnections among model functions. This network visualisation also enabled users to identify untested functions and assess overall test coverage comprehensively. The LLM-generated summaries facilitated a quicker understanding of each function's purpose within the model, enhancing usability for reviewers with varying levels of technical expertise. Throughout *assertHE's* development, we collaborated with industry partners, regulatory bodies, and academic institutions to ensure its applicability across diverse modelling frameworks. Feedback from these collaborators informed adjustments to the source code, making *assertHE* adaptable to a wide range of health economic models.

Conclusions: The *assertHE* package provides an effective toolkit for both developing and reviewing health economic models, streamlining the

quality assurance process and promoting model reliability. By automating routine checks, enabling detailed function mapping, and offering AI-generated summaries, *assertHE* helps reduce the resource demands of traditional manual reviews. This, in turn, could improve model validation efficiency and effectiveness, especially in settings where time or expertise constraints hinder thorough quality checks. The package's open-source nature and adaptability further allow it to be widely applicable, supporting best practices in health economic modelling. Through *assertHE*, we aim to contribute to a more rigorous, consistent, and accessible quality assurance framework for health economic models, with implications for enhanced policy decisions based on well-validated, reliable models.

abs-os427 Automatic Conversion from Excel to R Using the Reliable and Efficient Estimation of the Economic Value of Medical Research (REEEVR) Tool

PRESENTER: **Mr. Howard Thom**

SUMMARY: Complex models build in Microsoft Excel for health technology assessment (HTA) can suffer from long run times when performing probabilistic sensitivity analysis (PSA). This makes it difficult to fully explore parameter uncertainty and often limits the base case and scenario analyses to be deterministic. It also prevents the conduct of value of information (VOI) analysis, which quantifies the value of further medical research. A solution is provided by the R statistical programming language but expertise with R is limited and its learning curve is steep. We present an alternative method for Excel users to benefit from the greater speed of R by providing a tool to convert Excel models into R automatically. The converted model enables the calculation of VOI and the tool is named Reliable and Efficient Estimation of the Economic Value of medical Research (REEEVR).

METHODS: REEEVR requires users to specify the output cells of the Excel workbook, for example the incremental net monetary benefit or incremental cost-effectiveness ratio, but the conversion process is otherwise automatics. Using concepts drawn from interpreters and auto-coding REEEVR then parses, tokenises, generates abstract syntax trees (ASTs), and translates each cell of the Excel workbook. The ASTs are a language agnostic representation of the logic of the Excel workbook and theoretically facilitate conversion to any language. The exported R code is then ordered and redundant code which is not linked to the specified output cells is culled. Finally, libraries, extraneous code, and the program itself are output, along with an RShiny graphical user interface.

RESULTS: REEEVR is tested with deterministic and probabilistic decision trees and probabilistic Markov models. Exemplar tests comparing implants for hip replacement surgery demonstrated improvement in runtime from 95±2.1s in Excel to 0.323±0.02s in converted output for 3500 iterations. We require 106 iterations to yield run-times comparable to Excel, 34±2.5s. Due to loop unrolling used in the conversion, we also demonstrate speed improvement over the exemplar R model, 13.6±0.68s for R and 0.53±0.03s for the Excel-to-R conversion at 103 iterations. This work is achieved without additional improvements due to the use of RCpp, leaving avenues for further improvement.

CONCLUSIONS: The REEEVR converter has been developed using models from academia, industry, and with input from UK National Institute for Health and Care Excellence (NICE) Guidelines Development Group, which has lead to a variety of models that have been explicitly tested and demonstrated to be successfully converted from Excel to R , while also demonstrating a significant increase in PSA run-time performance.

abs-os428 Proof-of-Concept of a Process for Automatically Generating Excel Implementations of R Cost-Effectiveness Models

PRESENTER: **Ms. Yun-Ting Wang**

SUMMARY: The spreadsheet software Microsoft Excel is the dominant tool for health economic model development, with the majority of submissions to the Health Technology Assessment (HTA) agencies being developed in Excel. It is widely accepted that the R statistical programming language has much greater computational efficiency than Excel and can handle more complex and realistic models. However, only a subset of global HTA agencies accept R submissions from manufacturers, while others require Excel. Experience with R is also limited to specialists, restricting the transparency and usability of models build in R. We aim to overcome these barriers to the wider adoption of R by developing a framework for R modelling that enables the automatic export of Excel versions of the model. We prove that this concept is possible by implementing it for probabilistic Markov multistate cost-effectiveness models.

METHODS: We develop a template for Markov multistate models in R that represents cohort vectors and transition matrices with multidimensional arrays. This template also stores all samples of the input parameters but also specifies the distribution for these input parameters and the relation of the parameters to the transition matrices, state costs, and state utilities. The template is general so that users can specify the numbers of states, treatments and cycles; the allowed transitions between states; and the distribution for the input parameters. Sophisticated string manipulation functions are used to generate the Excel formulae for the Markov trace by linking the input parameters in a way that reproduces the matrix multiplication of the transition matrices with the cohort vector. String manipulation is also used to generate the Excel formulae for the total cost and quality adjusted life years (QALYs). These various formulae are then exported to an Excel sheet with a pre-built Visual Basic for Applications (VBA) macro that enables probabilistic sensitivity analysis.

We tested our template on a Markov model for smoking cessation with two states and two treatments, and a Markov model for hip replacement surgery with four states and four treatments.

RESULTS: The tests on the smoking cessation and hip replacement surgery examples indicated that the model logic was reproduced exactly. Results differed to a small extent due to differences in random number generation between Excel and R. The incremental cost-effectiveness ratio (ICER) for the two treatment smoking cessation model was approximately £3900/QALY in both the original R and exported Excel model. The incremental net benefit for the four treatment hip replacement surgery model model also approximately matched.

CONCLUSIONS: Our proof-of-concept study has demonstrated that it is possible to build a template for cost-effectiveness modelling in R that can automatically export an Excel version of the model. The concept could be used by manufacturers to develop a 'Global' R model that still allows county affiliates to submit an Excel version to HTA agencies that do not yet accept R. The concept could be extended to other model types such as partitioned survival models, semi-Markov models, and microsimulations.

10:30 AM –12:00 PM TUESDAY [Evaluation Of Policy, Programs And Health System Performance]

os229 Bali International Convention Centre – Frangipani

Interventions That Improve Maternal Health

MODERATOR: **Thuy Nguyen**, University of Michigan School of Public Health

CONVENER: **Ana Balsa**, University of Montevideo

DISCUSSANT: **Firman Witoelar**, Australian National University (ANU); **Stéphane Verguet**, Harvard University

abs-os654 Primary Care Provider Engagement Postpartum and the Reduction of Emergency Department and Urgent Care Center Visits

PRESENTER: **Anjelica Gangaram**

AUTHORS: Ishani Ganguli, Mark Clapp, Jessica Cohen

Background & Aim

In the United States, approximately 30% of emergency department visits are classified as non-urgent. Non-urgent emergency department visits are visits for conditions that do not require an immediate resolution, delaying the treatment of these conditions for several hours would not result in negative health consequences for patients. In addition to seeking non-urgent care at emergency departments, patients may also seek non-urgent care at urgent care centers. Urgent care centers are walk-in clinics for minor illnesses and injuries. When non-urgent care is obtained at emergency departments and urgent care centers, it is more expensive than if the analogous care was obtained at primary care physician offices. In addition to the increased financial costs, the dependence on emergency departments and urgent care centers for non-urgent care reduces the likelihood that patients develop relationships with their primary care providers and in turn diminishes patients' care coordination. Reduced care coordination can negatively affect the quality of care a patient receives. Substituting away from receiving care at emergency departments and urgent care centers and towards primary care physician offices may result in a variety of health and financial benefits for patients.

Socioeconomically disadvantaged, postpartum patients are more likely to obtain emergency department care relative to their more advantaged peers. The postpartum period is a medically complex time one where patients could benefit from engaging with their primary care providers. In our paper, we examine the effect of primary care provider engagement on emergency department and urgent care center utilization among postpartum patients.

Methodology

In our analyses, we use data from a randomized clinical trial that scheduled patients visits with their primary care provider within four months postpartum. We assess the effect of primary care provider engagement on having: an emergency department visit, an urgent care center visit, an emergency department or urgent care visit within one year postpartum. We also assess the effect primary care provider engagement has on the number of emergency department and urgent care center visits obtained during this period. To do so, we conduct instrumental variable and reduced form analyses.

Results

Preliminary results indicate that primary care engagement early in the postpartum period reduces emergency department and urgent care center utilization for up to a year postpartum. These results remain qualitatively unchanged in both the instrumental variable and reduced form analyses. Early postpartum primary care provider engagement results in heterogenous utilization effects by patient race suggesting that that provider engagement may have particularly salient effects among the disadvantaged. Our results tentatively suggest that increasing primary care engagement may improve postpartum health and well-being beyond the initial visit and have medium-term effects on health.

abs-os643 Protective and Preventive Tools for a Good Start: Supporting Families During Pregnancy Through a WhatsApp Chatbot

PRESENTER: **Ana Balsa**

AUTHORS: Juanita Bloomfield, Alejandro Cid

As early as the prenatal period, brain structure and function are sensitive to environmental influences. The formation of neural processing capacities depends directly on experiences in the womb that are affected by maternal stress, nutrition deficits, intake of toxic substances, maternal health problems, lack of exercise, or infections, among others. Despite this knowledge, most programs targeting early childhood development begin usually after pregnancy.

In this paper we report on the design, implementation and evaluation of an intervention aimed at optimizing the pregnant woman's health, fetus development, and pregnancy outcomes through the delivery of information, the administration of screening tools, and the provision of support. The intervention takes advantage of mobile technology and leverages behavioral science in its design. The program functions as a complement to the regular obstetric care received by pregnant women and is initially advertised through the primary care provider. The content is based on three pillars: (i) promoting healthy habits (physical activity, eating healthy, avoiding toxic substances), (ii) helping women maintain a healthy mental and emotional state, and (iii) encouraging father's involvement.

We assess the impact of the program by using a randomized controlled design on 1,190 pregnant women recruited from public and private healthcare providers in Uruguay. We find moderately sized improvements in pregnancy-related wellbeing for women at risk of depression at baseline, more engagement in self-care activities, and weak evidence of effects on diet and physical activity. We also observe signs of increased paternal involvement, as captured by a higher likelihood of assisting to prenatal controls and an increased intention of taking paternity leave days. On the other hand, results show that treated women with no risk of depression at baseline increase their depression symptoms and the risk of depression by the end of the pregnancy. The culprit does not appear to be increases in distress due to more demanding reference norms or an excess of cognitive load. Instead, we hypothesize that it is due to a higher awareness about emotions. Finally, we find, based on administrative data, that the intervention did not affect birth outcomes. (JEL: I12, I31, J13, H43)

abs-os655 When Abortion is Illegal: The Effects of Access to Medication

PRESENTER: **Azka Imran**
AUTHOR: Partha Deb

In countries where abortion is illegal, "do-it-yourself" abortions, which once involved wire-coat hangers, are becoming safer. Misoprostol, a stomach-ulcer pill which can be used to induce abortions, is making it easier for women to end unwanted pregnancies. Women are obtaining the drug on the black market and its use is developing primarily on a trial-and-error basis. As women have begun to experiment with the drug, doctors have sought to reach them with information on proper use.

In 2006, in Peru, clinicians in five of the country's twenty-five departments, adopted a so called harm reduction approach and began disseminating information on the use of misoprostol pills with detailed directions of dosage after confirming a woman's pregnancy. All women are encouraged to come in for an "after visit" for post-abortion care. If misoprostol is properly used, women present as if they are having a miscarriage, allowing physicians to complete termination and address complications with complete confidentiality.

We exploit the geographic variation in the implementation of the harm reduction program in Peru and use a difference-in-differences design to estimate the effects of the program on the rate of self-induced abortions, abortion related complications, pregnancy care practices, infant health outcomes, and women's labor market and educational outcomes.

We use three data sources: (1) The Perinatal Information System in Peru that collect clinical records on live births, infant health outcomes and information on the number of women receiving abortion related care (2) The Peruvian Demographic and Health Survey and (3) Encuesta Nacional de Hogares Survey. The former survey is a nationally representative cross-sectional household survey that collects data on self-induced abortions, and pregnancy care practices** and the latter is a nationally representative household survey that collects information on employment and education.**

Our analysis reveals that the rate of self-induced abortion increased by 1.7 percentage points, and the rate of adequate antenatal care increases by 1.4 percentage points (defined by the WHO organization as at least 4 antenatal visits) in treated regions.

Statistics on how many women take abortion pills without medical care are patchy. Still less is known about how they fared. Unsafe abortions claim the lives of 22,800–31,000 women (depending on the data source) annually, posing a serious public health issue. It is important to understand whether abortion harm reduction models can be used to mitigate harm in restrictive environments.

10:30 AM –12:00 PM TUESDAY [Health Beyond The Health System]

os231 Bali International Convention Centre – Bougainville

Breaking the Cycle: Economic Costs, Prevention, and Intergenerational Impacts of Child Maltreatment

MODERATOR: **Nicole Black**, Centre for Health Economics, Monash University

CONVENER: **Gabriella Conti**, UCL

DISCUSSANT: **David Johnston**, Monash University

abs-os764 The Architecture of Care: Professional Models in Early Home Visiting and Child Maltreatment

PRESENTER: **Gabriella Conti**, Department of Economics and Social Research Institute, University College London
AUTHORS: Tilman Brand, Malte Sandner, Soren Kliem

Background: Home visiting programs have shown promise in supporting disadvantaged families and preventing adverse childhood outcomes.

However, questions remain about optimal delivery models. This study examines the efficacy of two different delivery models of the ProKind intervention, a German adaptation of the evidence-based Nurse-Family Partnership (NFP) program. We compare two approaches: a continuous model (CM) where NFP-trained midwives deliver all visits from pregnancy through the child's second year, and a tandem model (TM) where visits are delivered by midwives during pregnancy and transition to social workers for postnatal care. This comparison addresses the critical question of whether professional continuity matters for program effectiveness.

Objective: Our primary aim is to evaluate the relative effectiveness of these delivery models in reducing three key outcomes that signal family adversity: surveillance by child protection services (CPS), foster care placements, and pediatric medical incidents. These outcomes were chosen as objective measures of child wellbeing and family functioning that can be tracked through administrative data.

Participants and Setting: The study recruited 755 pregnant women facing multiple disadvantages (including low income, limited education, and social isolation) from multiple centers across Germany. Participants were randomly assigned to either intervention (n=394) or control (n=361) groups. The intervention began during pregnancy and continued until the child's second birthday, with follow-up extending to the child's seventh year.

Methods: We conducted a longitudinal multicenter randomized controlled trial with two distinct follow-up phases: Phase I covered birth to 36 months, capturing immediate program impacts, while Phase II extended to approximately the child's 7th birthday, allowing assessment of sustained effects. To estimate average treatment effects (ATE), we employed augmented inverse probability weighting (AIPW), an innovative approach that combines outcome regression and propensity score methods. We enhanced this analysis by using lasso techniques to select relevant control variables, ensuring robust and precise effect estimation.

Results: The continuous midwife-led model demonstrated significant positive impacts across multiple outcomes. Most notably, it reduced hospital visits across both phases (ATE = -7.20, $p<.001$), suggesting improved child health and parental healthcare utilization. By Phase II, we observed promising trends toward reduced CPS surveillance (ATE = -5.24 percentage points, $p=.10$) and fewer foster care placements (ATE = -2.25 percentage points, $p=.09$). In contrast, the tandem model showed no significant effects on any outcome measure. Analysis of the combined intervention group revealed significant reductions in hospital visits during Phase II (ATE = -3.58, $p<.005$), though effects were smaller than for the CM alone.

Conclusions: Our findings demonstrate that delivery model choice significantly influences program effectiveness. The continuous midwife-led model shows superior outcomes, particularly in reducing healthcare utilization and trending toward decreased child protection involvement. These results suggest that professional continuity may be a crucial element in home visiting programs, potentially due to stronger therapeutic relationships and more consistent support. The sustained effects visible at age 7 indicate that early intervention through midwife-led home visiting can achieve long-term benefits for high-risk families. These findings have important implications for the design and implementation of home visiting programs internationally.

abs-os762 The Economic Burden of Child Maltreatment in Italy

PRESENTER: **Gabriella Conti**, Department of Economics and Social Research Institute, University College London
AUTHORS: Elena Pizzo, Francesca Marazzi, Emma Scandolo, Flavia Bustreo

Child maltreatment is a major public health problem in Italy, with significant consequences for victims and society. About 27% of adults recall experiencing physical harm during childhood, and 50% report having experienced harm, neglect, or poor parental relationships. The last comprehensive study on the cost of child maltreatment (Bocconi for Terres des Hommes & CISMAI, 2013) is more than ten years old, does not include some costs due to data unavailability and lacks econometric modelling; hence, there is a need to compute updated and more comprehensive estimates of the costs of this phenomenon. In this paper, we provide comprehensive updated estimates of the economic costs of child maltreatment in Italy, in relation to several long-term outcomes, ranging from physical and mental health problems to labour market outcomes and welfare use.

To compute the costs of child maltreatment on health and socio-economic outcomes, we adopt the two-step procedure of Conti et al. (*Health Economics,* 2021), which can be summarized as follows: (i) we perform econometric analysis using OLS and logit models to estimate the impact of child maltreatment on health and socio-economic outcomes, holding constant background characteristics; (ii) we perform the cost analysis using the regression results from step (i) and best-published evidence on the cost of each outcome. To estimate step (i), we use rich data from the 7th wave of the Survey of Health, Ageing and Retirement in Europe (SHARE) and the EU Agency for Fundamental Rights (EU-FRA) Violence Against Women Survey, which collect retrospective information on childhood. We complement our analysis with data on Italian hospital discharges for the period 2004-2016 to estimate the average cost per hospital admission associated with child maltreatment. We identify diagnoses related to violence and abuse via the associated ICD-9 codes; and we then compute the average cost for the NHS using the national tariffs, which are associated with every hospital admission via the DRG (HRG) codes.

Following previous work, we construct a global measure of child maltreatment as physical abuse, neglect, and a poor parental relationship. Assuming that the average age at which children are maltreated is 6 years old, on the basis of the survey data analysis, we find that child maltreatment: (a) increases the likelihood of experiencing depression in adulthood by 2.4pp, which translates into a discounted cost per victim of €5,973.29; (b) increases the likelihood of smoking by 6.6pp, which translates into a discounted cost per victim of €4,539.53; (c) increases the probability of receiving disability benefits by 2pp, amounting to a discounted cost of €3,133.96 per victim; (d) is associated with a productivity loss from reduced daily activities of €49,591.97. Additionally, using hospital registry data, we estimate that the average cost per hospital admission associated with child maltreatment is €1,418 per child (inflated to 2024).

Our estimates provide the first comprehensive benchmark to quantify the cost of child maltreatment in Italy and suggests more coordination is needed between health (GPs), social services and law enforcement to improve surveillance of child maltreatment and so reduce a substantial economic burden.

abs-os664 The Impact of Compulsory Schooling on Teen Fertility and the Intergenerational Transmission of Maltreatment

PRESENTER: **Adam Akmal Dzulkipli**
AUTHORS: Nicole Black, David Johnston, Leonie Segal

Background and Research Aim:

Victims of child maltreatment tend to suffer from a variety of adverse outcomes throughout the lifecycle, including poor educational attainment, poor health, and self-destructive behaviours. Maltreated females in particular are at higher risk of experiencing teenage pregnancies, which may negatively impact their future health and economic outcomes. Additionally, mothers who are exposed to abuse and neglect during their childhood have a higher risk of maltreating their own children, leading to the pervasive cycle of violence.

In this paper, we use a raising of the school-leaving age (RoSLA) reform in South Australia to examine the impact of schooling on teenage fertility outcomes and the intergenerational consequences of maltreatment. While economists have long documented a negative relationship between schooling and teenage fertility, whether these findings apply to maltreated children is an open question. We further contribute by examining the impact of schooling on the intergenerational transmission of maltreatment, which remains relatively unexplored in the literature.

Methodology:

In 2009, the South Australian government implemented new laws that mandated children to remain in education between the ages of 16 and 17. We use this reform in a regression discontinuity (RD) design to identify the impact of schooling on teenage fertility and intergenerational maltreatment, by comparing children born just before the reform cut-off (i.e. 1 January 1993) to children born shortly thereafter. Our analysis uses data from the Impacts of Child Abuse and Neglect study, which linked records from multiple government and semi-government agencies in South Australia to create a large dataset of the universe of children born in the state from 1986 to 2017.

Preliminary Results:

Preliminary analyses indicate that the RoSLA reform led to a 6.3 percentage point increase in school enrolment at age 16 among females with a history of Child Protection Services (CPS) involvement. Correspondingly, we find that these children are less likely to experience a pregnancy-related event at age 16. In particular, the reform led to a 43% reduction in teenage pregnancies and a 47% reduction in abortions. Effects for fertility-related outcomes in the five years after the new mandatory school-leaving age (between ages 17 and 21) were much weaker in comparison. This is consistent with an 'incapacitation' effect, whereby being in the school environment reduces children's propensity to engage in risky sexual behaviours. Tracking these females into the future, we find no significant difference in the birth outcomes of children born to mothers who were affected by the reform versus children born to unaffected mothers.

Conclusion:

We find that compulsory schooling policies play an important role in the lives of maltreated females by reducing their risk of teenage pregnancies. This is likely to have positive implications for these children's health and economic outcomes in the future. More generally, our results suggest that encouraging maltreated children to remain in school may remediate some of the adverse outcomes that these children face.

10:30 AM –12:00 PM TUESDAY [Evaluation Of Policy, Programs And Health System Performance]

os51 Bali International Convention Centre – Medan

Global Perspectives on Innovative Models for Health Care Delivery, Payment, and Cost-Sharing

MODERATOR: **Jui-fen Rachel Lu**, Chang Gung University

CONVENER: **Meng-Yun Lin**, Wake Forest University School of Medicine

DISCUSSANT: **John Langenbrunner**, Aceso Global

abs-os94 Episode-Based Cost-Sharing for Childbirth in the Privately Insured Population in the United States: Quantifying the Out-of-Pocket Cost Redistribution

PRESENTER: **Michal Horný**, University of Massachusetts Amherst

Background: In most clinical circumstances, patients in the United States do not know how much they will have to pay for their medical care until after that care is delivered. Consequently, many patients are forced into medical debt, even for planned health care encounters. The episode-based cost-sharing model—under which patient cost-sharing obligation is derived from the expected rather than the realized treatment intensity—was developed to provide patients with reliable, upfront out-of-pocket cost information while preserving mechanisms to contain moral hazard and sustaining premiums. Given the novelty of this model, evidence on its consequences is sparse.

Research question: The goal of this research was to quantify the cost redistribution under the episode-based cost-sharing model from patients who receive less than the statistically expected amount of treatment intensity to those who receive more in the setting of inpatient admissions for childbirth—a common and shoppable health-care-related episode—in the privately insured population in the United States.

Methods: Using health insurance claims from the 2021 Merative MarketScan Commercial Database, we identified inpatient admissions for childbirth and all associated health care services. For each childbirth encounter, we quantified the realized treatment intensity by aggregating services provided to both the birthing person and newborn(s) weighted by their respective national mean prices and estimated a price scale factor by dividing the total cost of care and the realized treatment intensity to measure the episode-specific price level at the given provider. We estimated patients' out-of-pocket costs under the episode-based cost-sharing model by applying each patient's insurance benefit design parameters to the product of the statistical expectation of treatment intensity and the estimated price scale factor. Finally, we compared the observed patient cost-sharing to the estimated amounts under the episode-based cost-sharing model using descriptive statistics.

Results: The study sample consisted of 98,635 inpatient admissions for childbirth. Mean patient cost-sharing was $2,783 (SD = 2,167) per episode. Under the episode-based cost-sharing model, patients would incur lower cost-sharing than under the status quo in 22,136 (22.4%) encounters, with a mean reduction of $793 (standard deviation [SD] = 1,233). At the same time, patients would incur higher cost-sharing than under the status quo in 63,683 (64.6%), with a mean increase of $754 (SD = 635).

Conclusion: By design, episode-based cost-sharing would reduce the financial burden for the minority of patients who have the bad luck of experiencing clinical complications during a planned episode of care and simultaneously increase the financial burden for the majority of patients who experience no—or only minor—complications. Notably, patients who would financially benefit from episode-based cost-sharing would experience a greater reduction in out-of-pocket costs than the amount by which out-of-pocket costs would increase for the majority of patients. As such, episode-based cost-sharing would introduce further redistribution of resources within a pool of insured individuals. Policymakers can use these findings to make better-informed decisions regarding potential implementation of the episode-based cost-sharing model. Future research should assess patients' preferences for this cost-sharing model and its impact on the incidence of medical debt.

abs-os95 Reduced Mortality and Admissions Through Integrated Care: Evidence from Taiwan's Family Doctor Program

PRESENTER: **Li-Lin Liang**, National Yang Ming Chiao Tung University
AUTHOR: Ms. Jui-fen Rachel Lu

Background:

Integrated care (IC) addresses fragmented health systems through a primary healthcare approach, targeting the triple aims of improving health outcomes, reducing costs, and enhancing patient experience. While its effectiveness is well-documented for single-disease management, its impact on multimorbid patients remains unclear. Over 70% of IC research focuses on North American and European models, where patient registration with family physicians is mandatory or incentivized. However, there is limited evidence on the design and implementation of IC in health systems where primary care delivery is weakly integrated into broader healthcare systems. This study addresses this gap by evaluating Taiwan's Family Doctor Program (FDP), a nationwide IC initiative introduced by the National Health Insurance (NHI) Administration to enhance care for high-cost, multimorbid chronic patients.

Research question:

What are the effects of the FDP on avoidable hospital admissions and all-cause mortality?

Methods:

We conducted survival analysis using nationwide data from the Taiwan NHI Research Database. Eligible patients were identified from the annual roster and assigned to FDP or non-FDP groups using a one-to-one matching method. Matching criteria included demographics, health status, healthcare utilization patterns, and attributes of the clinic most frequently visited. The study period spanned from 2013 to 2020, divided into baseline (2013–2016) and follow-up (2017–2020) phases. Analyses focused on hospital admissions and all-cause mortality, with final matched samples of 484,644 individuals for admissions and 826,996 for mortality. We employed multivariable modified Cox proportional hazards models and stratified analyses to assess FDP effectiveness.

Results:

FDP participants exhibited a 1.88% lower 4-year cumulative mortality incidence compared to non-participants (7.94% vs. 9.82%; $P<0.001$). After multivariable adjustments, FDP participants had a 3% lower risk of hospital admissions (adjusted hazard ratio [AHR]: 0.97; 95% CI: 0.95–0.98; $P<0.001$) and a 13% lower risk of death (AHR: 0.87; 95% CI: 0.86–0.89; $P<0.001$) than non-participants. The reduction in admission risk was most notable among patients under 65 and those with hyperlipidemia or diabetes (AHR: 0.95–0.96, $P<0.05$). All-cause mortality risk was significantly lower across all subgroups (AHR: 0.84–0.89, all $P<0.005$).

Conclusion:

The FDP's multifaceted IC approach—comprising case management, clinic-hospital care pathways, and team-based care—may explain its association with improved outcomes. Performance payments in the FDP are directed to primary care teams, who may share these payments with hospitals, thereby incentivizing hospital engagement in IC initiatives. This mechanism highlights the critical role of primary care coordination in achieving improved outcomes while fostering hospital collaboration. Taiwan's experience provides valuable insights for countries seeking to establish IC models in systems with less integrated primary care delivery.

abs-os93 The Performance Paradox: Longitudinal Payment Disparities for Safety-Net Providers in a U.S. Value-Based Payment Model

PRESENTER: **Ms. Meng-Yun Lin**, Wake Forest School of Medicine
AUTHORS: Amresh Hanchate, Zhang Zhang

Background

In an effort to shift the focus of Medicare payments from volume to quality, the United States implemented the Medicare Access and CHIP Reauthorization Act (MACRA) in 2015. This act introduced the Medicare Merit-Based Incentive Payment System (MIPS), which adjusts payments to clinicians based on performance across four domains: quality, cost, improvement activities, and promoting interoperability (use of electronic health records). Payment adjustments under MIPS range from negative to positive, with the potential to increase or decrease Medicare payments by up to 9% starting in 2020.

While MIPS aims to incentivize higher-quality care, it does not account for patient social determinants of health, raising concerns for clinicians who serve socially disadvantaged populations—often referred to as safety-net providers (SNPs). These providers, who are critical in delivering care to underserved communities, may face resource limitations and workforce shortages that could affect their ability to achieve higher MIPS scores and payment rewards.

Research Question

This study aims to assess how SNPs have fared under MIPS compared to non-SNPs over a four-year period (2018-2021). Specifically, we examine whether there are disparities in performance scores and payment adjustments that may disadvantage providers serving vulnerable populations.

Methods

The study identified 329,657 clinicians who participated in MIPS from 2018 to 2021. We defined SNPs as clinicians affiliated with safety-net hospitals (those in the highest quartile of Medicare Disproportionate Share Hospital payments) or outpatient providers serving communities with high rates of uninsured or Medicaid-covered residents. Our study focused on three key outcomes: (1) the likelihood of receiving positive payment adjustments ("rewards") consistently over four years; (2) changes in payment adjustments between the early (2018-2019) and later (2020-2021) years of the program; and (3) the cumulative impact on payment adjustments over the four-year period.

We employed multivariable regression analyses, adjusting for provider characteristics (sex, specialty, practice years), practice settings (practice size, health system affiliation), and patient risk factors (average clinical complexity and proportion of dual-eligible patients).

Results

Among the study cohort, 95,317 (29%) were identified as SNPs. Over the four-year period, SNPs consistently achieved slightly higher performance scores than non-SNPs, with average scores increasing from 90.6 in 2018 to 91.9 in 2021, compared to a rise from 88.7 to 90.4 for non-SNPs.

SNPs were 14.5% more likely ($p<0.001$) than non-SNPs to receive positive payment adjustments consistently throughout the study period. Additionally, SNPs were 16.6% more likely ($p<0.001$) to achieve improved adjustments in the later years (2020-2021) compared to the earlier years (2018-2019). However, despite their better performance, SNPs received lower cumulative dollar adjustments, with a net difference of \$0.39 less per patient served ($p=0.006$) relative to non-SNPs. Sensitivity analyses using matched samples, based on 2018 performance scores, yielded consistent results.

Conclusions and Policy Implications

Our study reveals a paradox in the MIPS program: although safety-net providers serving disadvantaged populations consistently performed well, they received lower cumulative financial adjustments compared to their non-SNP counterparts. This discrepancy may impose an unintended financial burden on SNPs, potentially undermining their ability to sustain care for underserved communities in the long term.

10:30 AM –12:00 PM TUESDAY [Health, Its Valuation, Distribution And Economic Consequences]

os8 Bali International Convention Centre – Hibiscus

The Hidden Costs of Caring: Unseen Economic, Health, and Quality of Life Impacts on Informal Carers.

SESSION CHAIR: **Hareth Al-Janabi**, Health Economics Unit, Institute of Applied Health Research, University of Birmingham

CONVENER: **Ann Livingstone**, Deakin University

abs-os23 Exploring Variations in Carer Quality of Life and Health Status Across Differing Health Conditions of Care Recipients.

PRESENTER: **Ann Livingstone**
AUTHORS: Jessica Bucholc, Lidia Engel, Clement Wong, Ms. Nikki McCaffrey

Background As the number of informal carers continues to rise, understanding the impact of informal caregiving, both economically and from a quality-of-life perspective, remains challenging. Many instruments have been developed and validated to measure carer quality-of-life impacts. However, how these tools compare across those caring for people with differing health conditions is unclear. **Objectives** This research aimed to compare the impact on quality of life for carers of people with various health conditions using three carer-specific preference-based measures: ASCOT-Carer, Carer Experience Scale (CES), and CarerQol; two preference-based health-related quality of life (HRQoL) tools: AQoL-8D and the EQ-5D-5L; and the Caregiver Reaction Assessment (CRA). **Methods** Data were collected through an online survey of 500 Australian informal carers. Participants completed three carer-specific preference-based measures (CES, ASCOT-Carer, CarerQol) in randomised order, two HRQoL tools (AQoL-8D, EQ-5D-5L), and the five domains of the Caregiver Reaction Assessment (CRA: self-esteem, schedule, family support, finances, and health). Preference-based instruments were scored using UK algorithms, while the AQoL-8D used the Australian value set. Total mean scores were estimated for the carer-related and health-related preference-based measures and CRA domains, and a linear regression model was used to compare the scores across the care recipient's different health conditions (temporary disease, chronic disease, dementia, mental health, intellectual disability, aging-related issues, terminal illness, and other illnesses). Sociodemographic characteristics were summarised using descriptive statistics. **Results** The analyses suggest there are significant differences ($p \leq 0.05$) in mean CES scores (N=375) for all health conditions except terminal illness compared with temporary disease, with mental health showing the largest difference (Coefficient 22.26, SE 4.20). There was also a statistically significant difference in mean AQoL-8D score (N=469) for chronic disease, mental health, intellectual disability, and terminal illness versus temporary disease. Mental health again showed the greatest difference (Coefficient 0.15, SE 0.04). Compared to temporary disease, carers of individuals with intellectual disability and other illnesses showed significant differences across four CRA domains (self-esteem (N=473), schedule (N=475), finances (N=474), and health (N=474)), carers of people with chronic disease, across all domains except self-esteem, and carers of individuals with dementia and mental health conditions just two domains, finances and health. **Conclusions** Meaningful differences in carer-related and health-related quality of life emerged across assessment tools and health conditions. Carers of individuals with mental health issues reported greater negative impacts on care-related and health-related quality of life. In contrast, carers of individuals with chronic diseases, intellectual disability, and other illnesses experienced a higher burden compared to the reference group temporary disease as measured by the CRA. These findings offer valuable insights into the diverse impacts of providing informal care, with the potential to guide the development of tailored support and services for informal carers globally.

abs-os323 How Well do Generic Preference-Based Measures Perform in Informal Carers: a Psychometric Study in Australia

PRESENTER: **Jan Faller**, Monash University
AUTHORS: Gang Chen, Lidia Engel, Cathy Mihalopoulos, Ms. Nikki McCaffrey, Brendan Mulhern

Background: Using generic preference-based measures (GPBMs) to capture informal care outcomes provides consistency across economic evaluations and facilitates combining patient and carer quality-adjusted life years. However, it is currently unknown how well GPBMs perform in informal carers. This study assesses the psychometric performance and dimensionality of the 5-level EQ-5D (EQ-5D-5L) and the Assessment of Quality of Life 8 Dimension (AQoL-8D) among Australian informal carers. Objective: To assess the psychometric performance of the EQ-5D-5L (the most commonly used measure in economic evaluation) and the AQoL-8D (a measure with a broader coverage of psycho-social domains of quality of life) among Australian informal carers. Methods: This was a secondary data analysis with data derived from an online survey administered to 500 informal carers across Australia. The online survey contained three carer-related measures (CES, CarerQol, ASCOT-Carer) and GPBMs (EQ-5D-5L, AQoL-8D). Descriptive analysis was conducted, including ceiling and floor effects analysis. Convergent validity was assessed through correlations (Spearman's rank) analyses with the three carer-related measures and discriminative validity tested using Mann-Whitney U and Kruskal-Wallis tests based on a priori hypothesised relationships between the EQ-5D-5L, AQoL-8D and the informal care situation. Test-retest reliability was assessed for respondents who self-reported 'no change' in their quality of life as a carer over two weeks using the EQ-5D-5L. An exploratory factor analysis (EFA) was conducted to understand the conceptual overlap between the AQoL-8D, EQ-5D-5L and the three carer-related measures. Ethics approval were secured from Deakin University (HEAG-H 91_2018) and Monash University (39031). Results: Mean informal carer utilities were 0.819 and 0.604 for the EQ-5D-5L and AQoL-8D respectively. Both did not show any ceiling or floor effects (threshold >15%). Test-retest reliability, which was only available for the EQ-5D-5L, revealed good agreement (ICC=0.825) with moderate (usual activities, pain and discomfort, anxiety and depression) to substantial (mobility, self-care) agreement on domains. Convergent validity analysis showed that both EQ-5D-5L and AQoL-8D had moderate correlations with the three carer-specific measures. Known-group validity suggested that the GPBMs had the ability to discriminate based on hours of care, number of tasks, number of care recipient diagnoses, number of recipients cared for, sharing a household and duration of care. EFA identified 9 factors with minimal overlap between the carer-related measures and the GPBMs. Discussion: The GPBMs tested are all acceptable for use in informal carers, and the choice of instrument to use will depend on the constructs to be measured. The inclusion of both generic and carer measures during outcome assessment may still be warranted to understand carer wellbeing and burden. Further research is still needed to examine responsiveness of the respective measures.

abs-os330 Developing a New Preference-Based Measure of Quality of Life for Carers of People with Dementia: Results From the COCOON Study

PRESENTER: **Lidia Engel**, Deakin University

Background: Providing informal care to a person with dementia can affect carers' quality of life. While existing generic preference-based measures (e.g., EQ-5D) may not be able to fully capture the caring experience, carer-specific measures (e.g, CarerQol), whilst preference-based,

are not anchored onto the dead-full-health scale to derive quality-adjusted life years (QALYs) in cost-utility analysis. Aim: The aim of the COCOON project was to develop a new preference-based quality of life questionnaire for carers of people living with dementia that can be used in cost-utility analysis. Methods: The development of the descriptive system was informed by: (1) interviews with 10 carers of people with dementia, assessing the face validity of candidate items; (2) an online survey of 202 carers of people with dementia, evaluating the psychometric performance of candidate items (missing data, floor-and ceiling effects, known-group difference, convergent validity, exploratory factor analysis and item response theory analysis); and (3) engagement with an Advisory Group. To derive preference weights for the new measure, a discrete choice experiment (DCE) with duration was constructed in an online survey and administered to a representative sample of the Australian general population (n=1000). A partial subset DCE design was used with 3 fixed attributes and 5 varying attributes, containing 240 choice tasks that were blocked, so that each respondent completed 12 choice tasks. A conditional logit model was used to generate an anchored model (anchored on the 0 to 1 dead-full health QALY scale). Results: From the initial pool of 60 candidate items, the advisory group selected 44 items for further testing in qualitative interviews with carers. These interviews helped identify and remove inappropriate items, ultimately reducing the total number to 35. Based on the psychometric analysis of candidate items and a final consultation with the Advisory Group, the final descriptive system of the quality of life measure comprised seven items: (1) emotional health; (2) physical health; (3) loss and grief; (4) loss of freedom; (5) loneliness; (6) support; and (7) financial burden. Each item is measured on a 5-point frequency scale, ranging from ‘never’ to ‘always’. For the development of the value set, several models were tested to smooth out the disordering of the utility estimates, with the final value set reflecting the monotonic nature of the descriptive system. Conclusion: The new developed COCOON measure of carers quality of life will enable the inclusion of carer outcomes in future cost-utility analysis in dementia, leading to more equitable and efficient resource allocation decisions.

abs-os333 Evaluating Methods for Including Caregiver QALYs in Economic Assessments: Impacts of Treatment Effects on Patient Cure, Morbidity, and Mortality

PRESENTER: **Holly Cranmer**
AUTHORS: Becky Pennington, Sarah Davis

Background: Traditionally, health technology assessments (HTAs) and economic evaluations have focused on patient outcomes, but there is increasing recognition of the broader impact of disease on the patient's support network. Including caregiver quality-adjusted life years (QALYs) can provide a more comprehensive picture of a treatment’s value, especially in conditions that require significant caregiving, such as chronic, progressive, or severe diseases. However, there are ongoing debates regarding the approach to incorporating caregiver QALYs into economic evaluations. **Aim:** To assess and compare five different approaches for incorporating caregiver QALYs into economic evaluations across six hypothetical interventions, each with varying effects on cure, mortality, and morbidity. **Methods:** Building on established methods from the literature, we examine five different approaches to modelling caregiver QALYs in a hypothetical disease setting characterised by mild, moderate, and severe health states. Additionally, we explore the impact of incorporating caregiver QALYs in the patient cure and patient death states. The five approaches are: (1) caregiver utilities, (2) caregiver disutilities, (3) increments relative to the best health state, (4) increments relative to the worst health state, and (5) increments relative to the midway health state. We examine how these approaches affect the incremental QALYs across the six interventions and under what conditions they are consistent with each other. **Results:** Incremental QALYs are consistent across all approaches when caregiver QALYs are included for both the patient cure and death states. Caregiver QALY gains are observed in scenarios where the intervention improves morbidity without curing patients, where the intervention cures all patients without affecting mortality, and where the intervention improves cures all patients and extends survival. Conversely, caregiver QALY losses occur in scenarios where the intervention improves mortality but does not cure patients. When caregiver QALYs are excluded for the patient cure and death states, the only scenario where incremental QALYs remain consistent across all approaches is when the intervention improves morbidity without curing patients and does not affect mortality. When caregiver QALYs are included for the patient cure state but excluded for the death state, the only scenario where incremental QALYs remain consistent across all approaches is when the intervention cures all patients but does not impact mortality. **Conclusions:** Where caregiver QALYs are relevant for inclusion in economic evaluations, including them for both patient cure and patient death ensures consistency across modelling methods. Nevertheless, there are still challenges in ensuring the validity of the results that require further exploration. One key consideration is whether caregiver QALYs would be affected by extending mortality in the cured health state. Another important question is how caregiver QALYs would be impacted following the death of a patient. Ongoing research aims to engage caregivers and stakeholders in discussions around key questions, with the goal to advance the methods for including caregiver QALYs in economic evaluations.

10:30 AM –12:00 PM TUESDAY [Supply And Regulation Of Health Services And Products]

os94 Bali International Convention Centre – Jakarta A

Factors Influencing Recruitment and Retention of Healthcare Workers

MODERATOR: **Amy T. Hsu**, Bruyere Health Research Institute

DISCUSSANT: **Joanne Spetz**, University of California, San Francisco; **Sung-Hee Jeon**, Statistics Canada

abs-os117 Developing a Consolidated Conceptual Framework for Understanding Physicians Choice of Specialization Throughout Their Medical Careers

PRESENTER: **Ms. Amy T. Hsu**

Background and Aim: There is a significant shortage of geriatricians worldwide, with the demand far outpacing current supply. In the United States alone, it's estimated that about 30,000 geriatricians will be needed by 2030; yet, less than 7,300 certified geriatricians currently practice

nationwide. Studying motivating factors can help develop strategies to attract more physicians to this specialty. Many existing studies have examined the factors medical trainees and professionals consider when choosing a specialty or sub-specialty. However, no single conceptual framework currently consolidates all these factors and determinants into one relational system to provide a comprehensive overview of how decisions concerning a career in a specific medical specialty or sub-specialty are made.

The aim of this scoping review was to, first, identify conceptual frameworks and models that summarize factors influencing the decisions of medical students, residents, and physicians when selecting a medical specialty or sub-specialty. Then, individual factors and their associated domains from the identified conceptual frameworks are compiled into a consolidated framework. Finally, we applied the consolidated framework to understand the motivating factors for choosing a career in geriatric medicine.

Method: We developed a search strategy with a medical information scientist and searched six databases, including MEDLINE, Embase, PsycINFO, CINAHL, Web of Science, and ProQuest Dissertations & Theses Global. We considered all study designs but only included studies that presented a multifactorial conceptual or theoretical framework summarizing the determinants of medical trainees and physicians' pursuit of a specialty or sub-specialty. Studies that do not focus on careers in allopathic medicine or focused on medical education systems outside of North America were excluded, given our focus on application towards North American medical education and training. Articles were independently screened by at least two reviewers. Data from included studies were charted, and results were described narratively.

Results: A total of 5,469 abstracts and titles were retrieved, with 839 selected for full-text review (ongoing). We anticipate that broader domains, including student and medical school characteristics, attitude towards specialty, specialty profile, personal values, and career needs will be significant determinants in choosing a medical specialty.

Implications: Conceptual frameworks are crucial for understanding career decision-making, shaping educational policies and programs, and identifying gaps in the literature to inform future research in medical education. As the global population ages, the demand for geriatric care is increasing rapidly. Understanding what draws physicians to geriatric medicine can help healthcare systems and policymakers create incentives and programs to ensure adequate care for older adults.

abs-os312 Gender Mix Prescription: Is it the Cure for GPs Job Satisfaction and Retention?

PRESENTER: **Martina Repetto**
AUTHOR: Margherita Agnoletto

Background: Job satisfaction is a critical component of worker well-being, significantly impacting turnover rates, absenteeism, and productivity. Although previous research highlights the influence of workplace gender composition on job satisfaction, most studies focus on large, hierarchical, male-dominated firms. This study examines the effect of gender composition among general practitioners (GPs) in Australia —a setting characterized by small to medium-sized practices, frequent coworker interactions, high earnings, limited promotion opportunities, and a balanced gender distribution.

Objectives: We investigate how changes in the proportion of female GPs within a practice affect overall job satisfaction, various lower-level satisfaction domains (e.g., satisfaction with colleagues, recognition at work, freedom in work methods), intentions to quit medical work, and the service quality of "stayer" GPs—those who remain at the same practice over time.

Methodology: Using data from the Medicine in Australia: Balancing Employment and Life (MABEL) longitudinal survey, which includes approximately 3,500 GPs over 11 annual waves from 2008 to 2018, we employ individual fixed-effects models to control for unobservable time-invariant characteristics, dealing with potential endogeneity concerns in several ways. Among others: we focus on GPs who remain in the same practice over time, excluding them when they change practices to mitigate future self-selection. We also exclude GP principals to mitigate biases related to hiring preferences and we conduct additional randomness checks on our independent variable.

Key findings: Our findings reveal that an increase in the proportion of female GPs within a practice positively affects overall job satisfaction and specific components such as satisfaction with colleagues, recognition received for good work, and with working hours. These effects are driven by female GPs, who exhibit increased satisfaction across all areas and greater freedom to choose their own working methods. We do not observe significant effects on service quality, except for a decrease in consultations with others among male GPs and a decrease in patients seen per hour among female GPs. Additionally, intentions to quit medical work decrease. We find support for some mechanisms to explain the role of gender composition on job satisfaction. GPs are less likely to report having a poor support network at work when the proportion of women increases. They also experience lower stress in managing the practice and face a reduced probability of aggression from colleagues or supervisors. Furthermore, we investigate the role of gender balance and discover that the effects of increasing the proportion of female GPs are moderated when accompanied by a decline in gender diversity within the practice. This suggests that diversity itself enhances job satisfaction.

Conclusions: These findings contribute to the understanding of how gender composition affects job satisfaction and retention in a high-skilled, gender-balanced workforce. They have important implications for policy and practice, highlighting the potential benefits of promoting gender diversity within healthcare settings to enhance worker well-being and reduce turnover intentions. Our results are robust to multiple sensitivity checks, including the Oster test and assessments of the randomness of the independent variable.

abs-os160 Homecare Labour Supply: Modelling Determinants of Homecare Personal Support Worker Exit

PRESENTER: **Katherine A.P. Zagrodney**, University of Toronto
AUTHORS: Emily King, Rachael Jaffe, Sandra McKay
Background: Inadequate health workforce supply is one of the most pressing challenges facing healthcare systems worldwide. In homecare, there is a mismatch between chronic shortages of personal support workers (PSWs) and the growing demand for PSW services to support an aging population. Despite many healthcare systems' expanding reliance on homecare PSWs, literature applying quantitative methods

to examine homecare PSW exit from employment (turnover) is relatively limited. Insight into factors influencing homecare PSW turnover are essential to building sustainable healthcare systems that meet population needs. **Objectives:** 1) Describe turnover rates of homecare personal support workers (PSWs) in Ontario, Canada 2) Determine the relative effects of demographic and workplace factors on homecare PSW decisions to take long-term absence or exit from employment. **Data:** The study used longitudinal, individual-level, retrospective administrative data of over 2,704 PSWs providing over 6.6 million hours of publicly funded care within a homecare organization in Ontario, Canada over the last three years (April 2021 - May 2024). **Statistical Analysis:** Multilevel multinomial logistic regressions estimated the effect of a PSW exiting employment or a long-term absence from work relative to working in a given week across two stratified models (late- and post- COVID-19 pandemic). The models were adjusted for individual-level heterogeneity, demographic factors (e.g. age, gender), and workplace factors (e.g., income, distance travelled between homecare visits, and job tenure). **Results:** The majority of the PSW sample (n = 2,704) were female (96%) with an average age of 44 years. Approximately one-sixth of the sample exited employment within the study period (18%) and one-third experienced a long-term absence at some point over the three years (28%). Higher income significantly decreased the odds of a long-term absence or turnover across all models while longer distances between visits increased the odds of turnover during the pandemic. Each additional year of employment tenure was associated with a decrease in the odds of leaving their job. **Conclusions:** Findings from this research provide insight into the increasingly critical topic of homecare labour supply. Utilizing an individual-level and longitudinal dataset, preliminary findings suggest that key determinants of homecare PSW turnover were lower income, further travel distance between visits, and higher localized demand-to-supply ratios. Targeted policies such as improved financial remuneration and reduced travel between visits can be expected to improve retention for this increasingly vital workforce. As demand for homecare PSWs is forecasted to rise over the coming years, improving homecare access and PSW workforce stability will be critical to meet the needs of those relying on care at home.

12:00 PM –1:30 PM TUESDAY [Social Events]

Bali International Convention Centre

Lunch - Exhibition Gallery (Level 2) with some overflow in front section of Exhibition Hall (Level 1)

12:00 PM –1:30 PM TUESDAY [Social Events]

Bali International Convention Centre – Exhibition Hall

Mentoring Lunch - Back section of Exhibition Hall

1:30 PM –3:00 PM TUESDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Orchid

Inequity in Access to Health Care Services

MODERATOR: **Jacob Novignon**, University of Ghana

Ind-571 Treatment Preferences and Their Determinants Among Adults With Depression or Anxiety in Outpatient Mental Health Care: A Systematic Review

PRESENTER: **Lara Lenz**

AUTHORS: Hans-Helmut König, Melanie Leitner, André Hajek

Background:

Due to rising prevalence of depressive and anxiety disorders, we experience a growing demand for mental health care. However, treatment gaps, long waiting times for psychotherapy and high rates of treatment drop-outs show that the system is overwhelmed and better allocation of resources is needed to secure timely and effective mental health care. Accommodation of treatment preferences is known to improve treatment outcomes and increase patient satisfaction.

Aim:

The aim of this study was to systematically review studies that elicited treatment preferences and their determinants among adults with depressive or anxiety disorder for outpatient mental health care.

Methods:

The study was registered in PROSPERO and followed the PRISMA guidelines. Studies were systematically retrieved from four databases (Web of Science, PubMed, CINAHL, PsycInfo) from inception to May 2024. Study screening was performed in a three-step process (title, abstract, full-text) in duplicate. We included studies of all types that assessed and reported treatment preferences of adults with depressive or anxiety disorder for outpatient mental health care, and that were published in English or German. We made no restrictions regarding geographical

location or year of publication. We did not review grey literature. Extracted data on preferences and determinants was summarized. Preferences were categorized into *treatment approaches*, *psychotherapy delivery and setting*, and *psychotherapy parameters*. Determinants were grouped into *sociodemographic* and *health-related factors*. Study quality was assessed with the Mixed-Methods Appraisal Tool (MMAT).

Results:

Of 14,035 identified records, 19 studies were finally included in the review for qualitative synthesis. The studies were conducted in Europe (n=8), the United States (n=8) and Australia (n=3). Seventeen studies were quantitative and two used a mixed-methods approach. Depressive disorder alone was examined in 14 studies, anxiety disorder alone in four studies and one study observed both disorders. The overall quality of the studies was moderate, with main issues concerning nonresponse bias, preference elicitation and statistical methods. Preference elicitation methods ranged from simple (single or multiple choice) questions to discrete choice experiments. Types of preferences examined relate to *treatment approaches* (n=13), *psychotherapy delivery and setting* (n=10) and *psychotherapy parameters* (n=7). Despite high heterogeneity in terms of statistical methods and preference types, three main findings were identified: 1) psychotherapy was preferred over medication, 2) face-to-face treatment was preferred over digital treatment, and 3) individual therapy was preferred over group therapy. Regarding determinants, results were highly diverse and many findings derived from single studies.

Discussion:

Our review synthesized existing evidence on treatment preferences and associated determinants in outpatient mental health care. Results showed considerable heterogeneity regarding preference types, determinants and statistical methods. We highly recommend to develop and use standardized instruments to assess treatment preferences to enhance comparability of studies and thus, strengthen the evidence. In terms of clinical implications, providers should be aware that preferences can be diverse, which highlights the importance of assessment and integration of treatment preferences into care planning to provide individualized mental health care.

Ind-664 The Impact of Free Care on Health Care Use and Financial Protection Among Vulnerable Women: Evidence from a Randomised Controlled Trial in Cameroon

PRESENTER: **Kasim Allel**, Centre for Global Health Economics, UCL
AUTHORS: Aurelia Lepine, Stephanie Moyoum, Tamoufe Ubald, Iliassou Mfochive-njindam, Sandie Szawlowski, Eric Defo Tamgno, Emilemichel Nitcheu

Background User fees in low-income countries have been linked to health inequalities, particularly among vulnerable populations. Removing these fees is anticipated to improve health service utilization and provide financial protection, though recent studies present mixed results. This study aims to assess the impact of free health care on health service use and financial protection for a vulnerable population in Cameroon.

Method A randomized controlled trial was conducted in Yaoundé, Cameroon, with 1,147 women and girls involved in transactional and commercial sex. Participants were randomly assigned to a treatment group, which received free health care for themselves and up to six dependents over 12 months, or a control group, which received no intervention. Data on health care use and out-of-pocket expenditures were collected at 6 and 12 months through surveys and hospital records.

Results The free care intervention led to a moderate increase in health care use and a substantial improvement in financial protection. However, out-of-pocket expenses during the last illness decreased by 98.3% ($p < 0.01$), the likelihood of experiencing a health-related economic shock reduced by 8.75 percentage points (14.4%, $p < 0.05$), and the incidence of catastrophic health expenditures fell by more than 30% ($p < 0.05$).

Conclusion This study highlights both the challenges and benefits of removing user fees in a low-income setting. While the intervention improved financial protection significantly, it only moderately increased health care utilization, likely due to barriers such as self-medication preferences, stigma, and supply-side issues like drug shortages. Nonetheless, the findings demonstrate the potential for health insurance models to enhance financial protection among vulnerable groups in low-income countries

Ind-1189 Assessment and Optimization of the Spatial Accessibility of Pediatric Healthcare Resources in Beijing,China

PRESENTER: **Jiawei Zhang**, Peking University
AUTHORS: Zhihu Xu, Peien Han, Chao Gong, Li Yang

Background: In recent years, the demand for pediatric services has surged, particularly during peak seasons for respiratory infectious diseases. This surge has often led to overcrowding in care facilities, straining the healthcare system and exposing systemic vulnerabilities. Addressing these challenges requires a focus on equitable access to healthcare for children, which is essential for reducing health disparities.

Objectives: This study aims to investigate the allocation of pediatric resources in Beijing, analyze disparities in the distribution of pediatric physicians and beds, and propose optimization strategies to enhance accessibility.

Methods: This study summarized the issues in pediatric resource allocation in Beijing through key informant interviews. Data pertaining to hospitals and the population for 2022 were sourced from the Beijing Municipal Health Commission. Initially, spatial accessibility to pediatric physicians and beds for resident children was analyzed using the modified two-step floating catchment area method. Subsequently, birth rates and population growth rates by district were used to predict the number of children in 2025. Finally, an optimization model was applied to determine the additional pediatric beds required to maximize equity across districts.

Results: In 2022, Beijing had a total of 4,704 pediatric beds, falling short of national standards by 1,104 beds (the national target for 2020 was

2.2 beds per 1,000 children), and 4,011 pediatric physicians, exceeding the national standard of 0.69 physicians per 1,000 children. The opinions of 11 experts emphasized three major challenges: (1) difficulties in training paediatricians, (2) insufficient pediatric bed capacity, and (3) uneven resource distribution across administrative districts.

We then calculated the spatial accessibility of pediatric physicians and beds in Beijing and optimized their spatial distribution. Across 7,184 communities, the average accessibility of pediatric physicians and beds was 0.97 physicians and 1.17 beds per 1,000 children, respectively. Notably, 45.28% of communities had fewer than 0.3 physicians per 1,000 children, 36.26% of communities exhibited bed accessibility below 0.3. In an optimized setting, Daxing District (requiring an additional 245 beds), Tongzhou District (203 beds), and Mentougou District (203 beds) emerged as the top three districts, all of which are non-central urban districts, are most in need of augmented bed capacity. With resource optimization, the average accessibility of pediatric beds improved to 1.68, with 2,076 communities (28.90%) having bed accessibility below 0.3, which represented a significant improvement.

Conclusions: There were significant spatial disparities in the accessibility of pediatric physicians and beds across Beijing. The central urban districts had better access, while the northern and southern suburban districts faced greater challenges. Focusing resources on areas with low accessibility can enhance service accessibility and reduce cross-district healthcare seeking. Compared to increases in pediatric beds based on population and policy target values, this optimized allocation methodology enabled a more equitable distribution, prioritizing healthcare accessibility over population size. These findings underscore the importance of incorporating accessibility considerations into healthcare planning to ensure equitable provision, guiding future strategies for allocating pediatric physicians and bed capacity upgrades aligned with broader health policy goals.

Ind-1704 Exploring Potential and Challenges of Cost-Sharing Policy Initiatives in Indonesia: Reflection from Global Experiences and Stakeholders Perspectives

PRESENTER: **Zahrina Laborahima**
AUTHORS: Pujiyanto Pujiyanto, Gemala Chairunnisa P, Budi Hidayat, Khairun Nisa'il Hulwah, Atmi Roseva, Mahlil Ruby, Arif Budiman, Sarah Dewi Mustika, Atik Nurwahyuni, Amila Megraini, Ibnu Susanto, Adang Bachtiar

Background: The Social Security Fund for the National Health Insurance Program (JKN) in Indonesia is projected to face a deficit of up to IDR 18 trillion by 2027. To address this, cost containment policies are necessary, including interventions on the demand side through the implementation of cost-sharing mechanisms. Indonesian regulations have outlined the need for cost-sharing policies, particularly for conditions susceptible to participant misuse. This study aims to explore the implementation and impact of cost-sharing policies in various countries and assess stakeholder perspectives on the potential introduction of cost-sharing in Indonesia.

Methods: A scoping review approach was used to systematically and iteratively synthesize relevant journal articles, reports, and regulations on cost-sharing. The analysis focused on the impact of cost-sharing on health service utilization, economic impact, and patient health outcomes. Additionally, this study used the Analytic Hierarchy Process (AHP), in-depth interviews, and focus group discussions (FGDs) to capture stakeholder views and preferences regarding the potential adoption of cost-sharing policies.

Results: Of a total of 865 articles in the review, 38 were included. These articles highlighted the diverse implementation of cost-sharing across different types of services, target populations, amounts, and payment methods. The copayments ranged from IDR 17,000 to IDR 231,000, while coinsurance rates ranged from 7% to 30%. In terms of clinical impacts, 82% of studies found no significant evidence, 13% indicated negative impacts, and 5% were neutral. Regarding economic impacts, 18% reported positive effects, while 11% noted adverse outcomes. For utilization impacts, most studies (34%) indicated a reduction in service utilization. Standard services subject to cost-sharing included childbirth, physiotherapy, dental care, and cataract surgeries. Key stakeholders agreed that cost-sharing policies should be implemented to ensure the sustainability of the JKN program and regulate participant behavior.

Conclusion: Any cost-sharing model to be implemented in Indonesia must carefully consider public acceptance, ease of implementation, and the long-term sustainability of the JKN program. The types of services included and the amount of cost-sharing should align with the principles of financial protection, considering the ability to pay (ATP) while excluding catastrophic or life-saving services from the cost-sharing scheme.

Ind-838 Partial Change in Patient Cost-sharing Affects All? Evidence from National Health Insurance Reform in Korea

PRESENTER: **Yuichi Watanabe**

Background:

The price sensitivity of health care consumption and the effect of change in patient cost-sharing on health care utilization have been one of the major concerns in health economics with the wide coverage of public health insurance throughout the world. Recent studies focus more on the elderly population due to a growing interest in aging society worldwide. Nevertheless, relatively little is known about how patient demand for health care varies by price range and types of healthcare facilities among the elderly. This study is expected to fill the gap by analyzing the quasi-experimental policy reform in Korea.

Objective:

Korean government reformed the national health insurance (NHI) scheme in 2017; out-of-pocket expenses for the elderly (over 65 years of age) outpatient care costing from 15,000 to 25,000 KRW in (dental) clinics were reduced from 30% to 10% or 20% of total spending since 2018 to alleviate their financial burden of having a minor illness and induce them to go to clinics rather than large hospitals, while their copayments for other price levels or those in the case of hospital visits were not changed. We aim to examine the causal impacts of this partial change in patient

cost-sharing among the elderly on outpatient care use and spending in clinics, allowing for a deeper investigation into the heterogenous and spillover effects across demographic groups and disease classification.

Data and Methods:

We use the sample cohort database from 2016 to 2019, provided by the National Health Insurance Service. It represents a patient sample of 2% randomly extracted from qualified NHI subscribers and medical aid recipients, including individual medical claims records and additional information on demographics and socioeconomic status. We employ a difference-in-differences (DID) estimation with fixed-effects according to price range of total expenses, where the treatment (control) group is defined as outpatient visits to clinics (primary hospitals). Primary hospitals are assumed to be a counterpart of clinics in Korea when patients with mild disease use outpatient services.

Results and Implications:

Our DID estimation for the entire sample shows that partial reduction in the copayment rate decreases overall out-of-pocket expenses in clinics by approximately 1,600 KRW per episode without significant increase in outpatient visits, while the reduction in out-of-pocket payments by 2,000 to 4,000 KRW on average and an increase in visits to clinics are found in the targeted price range as expected. We also demonstrate a significant decrease by around 1,000 KRW per episode even in the untargeted price level (over 25,000 KRW) as a spillover effect. These overall and spillover impacts are larger for females and the richer group as well as in disease areas of the eye, ear and circulatory system. However, we do not observe these effects in dental clinics. Our findings imply that partial change in patient cost-sharing applicable to clinics helps to lead the elderly in mild condition to go there at a lower cost on average rather than to primary hospitals that should treat more severe patients, contributing to the efficient allocation of healthcare resources.

Ind-1759 Patient Preferences for Centralisation of Surgical Services for Oesophageal Cancer: a Discrete Choice Experiment

PRESENTER: **Norma Bulamu**, Flinders University
AUTHORS: Gang Chen, Josipa Petric, David Watson, Tim Bright

Background and Aims: Surgery for oesophageal cancer (OAC) in a centralised high-volume centre has significant benefits to outcomes for patients including lower mortality and shorter length of stay, compared to localised low volume centres. However, patients may value and perceive these benefits differently and may be willing to make trade-offs for access to localised services. This may be due to a lack of a support network associated with a centralised high-volume centre, the need to travel further, or the costs associated with travel. The aim of this study was to understand whether these factors are important to patients, and how they influence the choice of surgical services.

Methods: A discrete choice experiment (DCE) was conducted to investigate the preferences for localised low volume centres or centralised surgical services in a high-volume centre. Attributes included were distance travelled to hospital (<10km, 50km,

400km, >1000km), risk of in-hospital mortality (1%, 3%, 8%), length of hospital stay (7-10 days, 11-20 days, >20 days), out-of-pocket cost ($0, $1-$1000, $1001 - $5000,

>$5000) and five-year survival (30%, 40%, 50%). Four respondent groups from metropolitan and rural/remote areas were recruited: patients under surveillance, OAC survivors, doctors, and the general population. Data was analysed using the framework of random utility theory.

Results: The DCE was completed by 85 surveillance patients, 30 cancer survivors, 80 clinicians, and 100 from the general population.

Significant preference was observed for travel distance of >10km (except survivors), risk of hospital death under 3% (survivors and clinicians), hospital stay under 11 days (survivors and general population), out-of-pocket costs under $1000 and 5-year survival over 40% (clinicians and general population). Similar trend of significant preference was observed when disaggregated by residence (metropolitan vs rural/remote), however, preference for lower risk of hospital death (1%) and higher 5-year survival (50%) was not significant for the rural/remote respondents.

All respondent groups had >50% probability of choosing a centralised service (reference: distance= 400km, risk of mortality=3%, hospital stay=11-20 days, out-of-pocket cost=$1-$1000, 5-year survival=40%) over a localised service (reference: distance= 50km, risk of mortality=8%, hospital stay=>20days, out-of-pocket cost=$0, survival=30%) across all attribute levels except the general population.

The probability of choosing a centralised service was most affected by higher risk of hospital death (from 83% at 1% risk to 70.2% at 8% risk) and out-of-pocket costs (from 75.9% at $0 to 62.6% at >$5000). This was also observed when disaggregated by residence. The general population switched preference to a localised service if the centralised service cost $1000-$5000 (58%) or >$5000 (62.8%) out-of-pocket.

Conclusions and Significance/Impact: Surgical services for oesophageal cancer are centralised in most parts of Europe but only in a few Australian states. With proven clinical benefits of a centralised service, this study provides the necessary patient perspective indicating that centralised surgical services are acceptable to clinicians and patients regardless of residence in metropolitan or rural/remote areas.

Ind-2249 Learning, But Not Paying: The Effect of Free Health Insurance on its Willingness to Pay

PRESENTER: **Henry Cust**
AUTHORS: Mingxuan Wu, Julienne Noo, Serge Billong, Aurelia Lepine, Iliassou Mfochive-njindam, Tamoufe Ubald, Emilemichel Nitcheu, Eric Defo Tamgno, Sandie Szawlowski

Abstract

Background: In sub-Saharan Africa, where the burden of HIV is disproportionately high among young women, improving access to health services is critical for reducing gender health disparities. Health insurance schemes have been promoted as a means to increase healthcare access, and as recent evidence finds to protect against risky behaviour and HIV infection, particularly for vulnerable populations. However, little is known about how receiving health insurance impacts the willingness of high-risk groups, such as women at high risk of HIV, to pay for such services in the future.

Aim: This study aims to examine the effect of receiving health insurance on the willingness to pay for continued coverage among women at high risk of HIV in Cameroon, a country where HIV prevalence remains significant and free health insurance has been found to effectively prevent HIV.

Methods: This study utilizes data from the POWER randomized controlled trial (RCT) in which health insurance was randomly allocated to women at high risk of HIV and their economic dependents. Data from the endline survey were used to assess the willingness to pay (WTP) for health insurance. WTP was elicited through bidding games with dichotomous choice questions, recorded as the switch point value, the amount stated in an open-ended question, or zero if all bids were rejected. Tobit models were employed to identify the effect of receiving health insurance on the WTP while controlling for socioeconomic determinants at baseline. To adjust for non-compliance, health insurance utilisation was instrumented using treatment assignment, and the local average treatment effect (LATE) was estimated via two-stage least squares (2SLS) models.

Results: The average willingness to pay (WTP) for health insurance was 42,579.40 FCFA (approximately 76.75 USD in 2021), with 89.57% of participants expressing a willingness to pay a non-zero amount. The experience of receiving health insurance did not significantly affect WTP, even when accounting for outliers and non-compliance. To scale up the intervention and uptake to be successful, our findings suggest an additional subsidy of $38 to $52 per capita would be required. Socioeconomic factors linked to higher risk of illness, such as being in transactional sex, younger age, and higher past health expenditures, were found significantly correlated with higher WTP and can be used to stratify targeted subsidies.

Conclusion: We show that whilst willingness to pay for health insurance is insufficient to cover the incurred costs, the amount of subsidy needed is relatively small and could be reduced with careful targeting. Receiving insurance for free for a year did not increase the WTP for health insurance, even after accounting for low compliance in treatment group, which could be due to the remaining barriers to health care and a possible anchoring effect. However, considering the vast benefits of providing health insurance to this population, subsidies represent an effective cost without burdening individuals with high out of pocket expenses.*

Ind-1517 Primary Health Care and Health-Related Quality of Life of Older Patients with One or Multiple Chronic Diseases in China

PRESENTER: **Jiajing Lee**
AUTHOR: Yongjian Guo

Background: China faces a dual challenge of rapid population aging and rising multimorbidity (≥2 chronic conditions). Primary Health Care (PHC) is positioned as the gatekeeper for chronic disease management, yet its effectiveness in improving Health-Related Quality of Life (HRQoL) among older adults with multimorbidity remains understudied.

Objective: This mixed-methods study examined the heterogeneous impact of PHC utilization on HRQoL among older adults (≥60 years) with single chronic disease versus multimorbidity in China, and identified systemic barriers to effective PHC delivery.

Methods: In quantitative study, Data from the Sixth National Health Services Survey (Shandong Province, 2018; *n*=12,938 households) were analyzed using a Simultaneous Equation Model (SEM). Outcomes included self-rated health (SRH), activities of daily living (ADL), depression/anxiety (DA), and physical pain (PP). PHC metrics included supply (doctors/beds per 10,000), accessibility (distance), and utilization (family doctor registration, chronic disease management sites).In qualitative study, semi-structured interviews (n=20 stakeholders) from an integrated multimorbidity management pilot in Sanshui District were coded using the Consolidated Framework for Implementation Research (CFIR).

Results:

1. Multimorbid older adults had significantly poorer HRQoL than single-disease peers: higher moderate/extreme DA (20% vs. <12%, $p<0.001$) and PP (>50% vs. <40%, $p<0.001$).

2. **Heterogeneous PHC effectiveness:** PHC supply/accessibility improved pain/ADL only in the single-disease group. No association was found for multimorbidity. Family doctor registration improved SRH in both groups (single: $\beta=2.929$; multimorbidity: $\beta=2.776$; $p<0.05$) but showed no association with mental health or ADL in multimorbidity. Chronic disease management reduced PP only in older people with multimorbidity ($\beta=0.092$, $p<0.01$).

3. **Systemic barriers:** Fragmented health information systems (lack of automated multimorbidity indicators, poor interoperability), unquantified PHC costs (multidisciplinary coordination, rural outreach), and digital divides hindered integrated care.

Conclusion: PHC utilization differentially impacts HRQoL in older adults with single versus multiple chronic conditions. While family doctors improve physical health perception in both groups, PHC fails to address mental health and functional limitations in multimorbidity. Reforms must prioritize integrated data systems, multimorbidity-focused performance metrics, and resource allocation for underserved populations.

Ind-2298 Health Literacy and the Use of Emergency Rooms. Experiment to Reduce Information Asymmetry By Guiding Patients with a Triage Service.

PRESENTER: **Sebastian Neumann-Böhme**, University of Hamburg
AUTHOR: Jonas Schreyögg

Introduction:
Emergency departments (EDs) are often misused for conditions that could be treated in primary care, contributing to system strain, delays, and increased costs. One contributing factor is **limited health literacy**, which impairs patients' ability to navigate the healthcare system and assess the urgency of symptoms. Patients may over- or undertreat due to uncertainty, especially in situations involving children. Building on theories of **credence goods** and **bounded rationality**, this study investigates whether targeted triage guidance can improve decision-making and reduce inappropriate ED use.

Methods:
A **vignette-based online experiment** was conducted with a representative sample of the German adult population (N=303). Participants were randomized to one of three arms: control, triage, or triage+framing. Each respondent evaluated one of two clinical scenarios describing a child with either urgent or non-urgent gastrointestinal symptoms. The triage tool offered structured advice on whether emergency care was needed; in the framed version, participants also received contextual information on ED overcrowding. Health literacy was measured using the HLS19-Q12 instrument, with particular focus on navigational aspects.

Results:
Participants with **limited navigational health literacy** were significantly more likely to opt for overtreatment in the baseline (control) condition (OR = 2.60, $p = 0.03$). Both interventions **reduced overtreatment**, with odds ratios of 0.39 ($p = 0.046$) and 0.34 ($p = 0.02$), respectively. The **framing intervention** additionally **reduced undertreatment** (OR = 0.21, $p = 0.083$), suggesting increased appropriateness in both directions. Gender and risk aversion were also significant predictors of behavior.

Discussion:
This study provides experimental evidence that **triage guidance tools** can mitigate the effects of low health literacy on emergency care decisions. While health literacy predicts overtreatment, the intervention **closes this gap**, especially among those with poor system knowledge. The vignette method allows for realistic yet controlled assessment of patient decision-making. These findings support the use of scalable, literacy-sensitive interventions to improve care navigation and reduce inappropriate ED use in the general population.

Ind-2571 Development and Validation of the Healthcare Access Barriers Scale: A Measurement Development Study Based on a Population Survey in Shanghai, China

PRESENTER: **Danyang Wei**
AUTHORS: Yusheng Jia, Jingyi Li, Min Hu, Xiaoyu Wang
Background: Access to healthcare remains a pressing global challenge, with significant implications for healthcare experience and health outcomes. Previous studies have predominantly relied on qualitative methods to examine healthcare access barriers, lacking unified theoretical frameworks and quantitative measurement tools. This study developed and validated the Healthcare Access Barriers Scale (HABS) and applied it to assess barriers by residents in Shanghai, China, providing evidence for identifying healthcare needs and designing targeted interventions.

Methods: A cross-sectional survey was conducted among 2,009 Shanghai residents. HABS was developed based on Penchansky and Thomas's Theory of Access and Saurman's modification. Exploratory and confirmatory factor analyses (EFA, CFA) assessed its structure. Reliability and validity were tested using Cronbach's alpha and model fit indices.

Results: Healthcare access barriers were conceptualized based on the theory and model of health services appropriateness， and encompassed six dimensions: unawareness, unavailability, inapproachability, adaptability, unaffordability, and unacceptability. The final 31-item HABS used a five-point Likert scale (1=strongly disagree, 5=strongly agree), with higher scores indicating greater perceived barriers. A total of 2,009 valid responses were collected and analyzed. The HABS demonstrated strong reliability (Cronbach's $\alpha = 0.974$) and a good fit for the six-factor model (CFA: Comparative Fit Index [CFI] = 0.937, Tucker-Lewis Index [TLI] = 0.930, Root Mean Square Error of Approximation [RMSEA] = 0.069). The mean score for access barriers was 3.03 (SD=5.78), with unaffordability scoring the highest (3.26, SD=1.16), followed by unawareness (3.19, SD=1.07), inadaptability (3.13, SD=1.07), unavailability (2.89, SD=1.22), unacceptability (2.87, SD=1.05), and inapproachability (2.84, SD=1.21).

Conclusion: The HABS is a valid and reliable instrument for measuring perceived healthcare access barriers in an urban population, offering a more holistic, process-integrated assessment by capturing obstacles across the full continuum of care – before, during, and after healthcare visits. This unified scale can facilitate systematic barrier assessment, comparison across settings, and identification of target areas for intervention. Future use of HABS may inform policies and programs to improve health service access and equity.

Ind-2691 Preferences for Alternative Kidney Donation Systems: Evidence From Sub-Saharan Africa

PRESENTER: **Maximilian Guigas**
AUTHOR: Jan Priebe

The shortage of donated kidneys remains a critical issue in addressing the needs of end-stage kidney disease patients, particularly in Sub-Saharan Africa, where infrastructural limitations hinder the establishment of deceased organ donation programs. Despite these challenges, progress in kidney transplantation is evident, such as successful operations by local surgeons in Ghana and availability of transplantation services at multiple centers in Nigeria. However, further advancements necessitate robust legal frameworks for transplantation practices in the

region. In the absence of deceased donations, alternative kidney procurement systems are being considered, though many of these proposals raise significant ethical and moral questions. This study aims to investigate preferences for alternative kidney procurement systems among individuals in five Sub-Saharan African countries, focusing on the impact of moral foundations and religious beliefs on support for these systems. The study deployed an online survey targeted at participants from Ghana, Nigeria, Tanzania, Uganda, and Kenya, recruited through Facebook Ads. Participants were randomly assigned to evaluate one of 16 alternative kidney procurement systems, categorized into exchange systems and undirected donation systems. The exchange systems varied by regional scope (national vs. international) and donor incentive (no incentive vs. priority on the waiting list). The undirected systems varied across three dimensions: regional scope, type, and level of incentive (no incentive, priority waiting list, low compensation, high compensation), and payment source (government vs. recipient). We further randomized into two groups, one receiving psychological primes to stimulate individuals into thinking about the role of organs in traditional African beliefs. We provide descriptive statistics to check for group balance and levels of support. To evaluate the impact of different dimensions on participants' support we use multivariate regressions (OLS). Preliminary results indicate that individuals with stronger religious beliefs show lower support for alternative kidney procurement systems, suggesting potential ethical or moral concerns. Additionally, the psychological prime further reduces support for these systems. We also find differences along personality traits (e.g. altruism). This study highlights the complex interplay of ethical, moral, financial and religious factors influencing public support for alternative donation frameworks. By integrating individual moral and religious perspectives, the research contributes to a nuanced understanding of the societal readiness for innovative organ donation methods and informs ongoing discussions on ethical transplantation practices in resource-constrained settings.

1:30 PM –3:00 PM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Bandung

Non-Communicable Diseases in Low and Middle Income Countries

MODERATOR: **Likke Putri**,

Ind-600 Exploring the Socio-Economic Toll of Non-Communicable Diseases in Low-Resource Settings: Novel Evidence from Mozambique.

PRESENTER: **Maria Verykiou**, SDA Bocconi University
AUTHORS: Giovanni Putoto, Aleksandra Torbica, Paolo Belardi

Background: Low- and middle-income countries face increasing public health challenges, with non-communicable diseases (NCDs) like diabetes and hypertension becoming increasingly prevalent. However, there is limited data on the socio-economic burden of these conditions in low-resource settings. This study seeks to fill that gap by estimating the economic burden of type 2 diabetes (T2DM) and hypertension (HTN) for patients in selected health facilities across two provinces in Mozambique.

Methods: This is a cost-of-illness cross-sectional study measuring the societal costs of T2DM and HTN in patients enrolled in an integrated disease management program. The costs measured included program implementation costs, direct healthcare, non-healthcare costs, as well as productivity loss at patient level. Primary data was collected through direct interviews with patients attending the program and healthcare personnel involved in delivering the services, while secondary data pertained to the program's cost of implementation.

Findings: The total implementation cost of the program amounted to $1.2M, equivalent to $3.2 per patient visited. Recurrent costs were reported per month per patient across disease groups, location, sex and income group. These averaged $49.8 per month per patient, with direct non-healthcare costs as the main cost driver at 74% of the total recurrent costs. Consistently higher costs across all cost categories were reported by diabetes patients ($62.4), males ($58.5), and patients from the upper-income group ($96.7). Patients from rural locations reported higher direct costs but lower indirect costs than urban patients. The average cost from the patient's perspective incurred by the lowest income group ($44.8) accounted for the majority (71%) of their reported monthly income, while 3% of the sample indicated that the costs incurred for the management of their disease were catastrophic.

Conclusions: The study is the first attempt to measure the socio-economic burden of T2DM and HP in Mozambique. Results offer valuable insight into the disproportionate economic impact of the diseases across income groups, with those living under the poverty line, who represent a significant proportion of the Mozambican population, being most negatively affected. Further research is encouraged to investigate the implications of these diseases for health systems in low-income countries.

Ind-620 Adapting Public Health Economic Models for Low- and Middle-Income Countries: A Case Study on Hypertension Prevention Modelling in Ghana

PRESENTER: **Joseph P Mensah**, University of Sheffield
AUTHORS: Chloe Thomas, Robert Akparibo, Alan Brennan

BACKGROUND: Hypertension is a significant and growing public health issue in low- and middle-income countries (LMICs), including Ghana, where it is a leading cause of cardiovascular disease. The prevalence of severe hypertension among adults aged 18-69 in Ghana is 11.8%, posing substantial health and economic burdens. Public health economic models, typically developed in high-income settings, are valuable tools for assessing the costs, health benefits, and cost-effectiveness of interventions for conditions like hypertension. However, adapting these models for LMICs requires careful consideration of context-specific challenges and data limitations. This study aims to adapt an existing public health economic model to evaluate hypertension prevention interventions in Ghana, and to highlight the methodological and

data challenges encountered when adapting models to LMIC settings.

METHODS: We selected the School for Public Health Research (SPHR) diabetes prevention model, a microsimulation model developed in the UK which has a conceptual framework suitable for modification, and adapted it to incorporate demographic, epidemiological, and health system characteristics specific to Ghana. Using data from the Ghana WHO Study on global AGEing and adult health (SAGE) longitudinal study, we developed multistate Markov models that include key risk factors such as BMI, alcohol consumption, and salt intake, to estimate transition probabilities for the individual lifetime simulation of hypertension progression and associated cardiovascular outcomes. The model evaluates intervention impact on hypertension prevalence, cardiovascular events, healthcare cost savings, and cost-effectiveness, measured in cost per Disability-Adjusted Life Years (DALYs) averted. Cardiovascular events were estimated from the WHO CVD risk chart for Western sub-Saharan Africa. Country-specific data on disease incidence, mortality, and intervention effects were derived from the Global Burden of Disease database, supplemented by literature and expert consultation. Probabilistic sensitivity and scenario analyses were conducted to assess robustness to variations in local data inputs.

RESULTS: Base-case results estimate an average per-person cost of $4,426.00 (95% CI: 2125.06, 7660.22) associated with hypertension over a lifetime horizon, using a 3% annual discount rate, corresponding with an average of 3.51 (95% CI: 3.314, 3.733) DALYs lost due to premature death or disability. The model simulation projected a total 1099 (95% CI: 857, 1326) CVD-related deaths per 10,000, with 325 stroke cases (95% CI: 293, 359), 522 MI cases (95% CI: 484, 555), and 759 heart failures (95% CI: 506, 990) across the lifetime of the population. Behavioural interventions targeting salt and alcohol consumption have the potential to avert disability-adjusted life years (DALYs) and reduce healthcare costs. Key adaptation challenges included limited longitudinal data, missing values, and potential bias due to reliance on observational or self-reported data.

CONCLUSION: In conclusion, this study demonstrates that adapted health economic models can inform policy decisions on hypertension prevention in LMICs. However, it also highlights the complexities and data constraints involved in such adaptations. Our findings advocate for the development of tailored health economic models to support evidence-based health policy and resource allocation in Ghana and similar LMICs. Future endeavours should focus on improving data availability and quality and explore health economic model adaptations, to enhance the robustness of health economic evaluations in diverse low-income settings.

Ind-1752 Efficient Pathways for Reducing NCD Mortality and Achieving SDG 3.4 in the South-East Asia Region

PRESENTER: **David Watkins**, University of Washington
AUTHORS: Cherian Varghese, Pradeep Joshi, Nalika Gunawardena

Most countries, including in the WHO's South-East Asia Region (SEARO), are off track for Sustainable Development Goal (SDG) target 3.4, which includes a one-third reduction in noncommunicable disease (NCD) mortality by 2030. The economic and health system impacts of Covid-19 has made achieving this target more challenging. This study sought to identify efficient interventions and scale-up options for SEARO countries to get back on track for SDG 3.4.

We built our analysis around a dynamic population model developed for the NCD Countdown 2030 Collaboration, with some notable improvements. In brief, it used demographic and epidemiological modeling approaches to project NCD-specific death and case counts and total population counts over time using WHO and UN Population Division estimates. We modeled the mortality effects and costs of 10 primary healthcare (PHC) interventions, 9 secondary/tertiary care interventions, and 6 intersectoral policies using published effectiveness evidence, WHO's "Best Buys," and a costing model adapted from the Disease Control Priorities Project. We explored alternative combinations of interventions under two different scale-up assumptions: a "realistic" scenario (2% annual increase in coverage) and an "ambitious" scenario (4% annual increase in coverage). The time horizon was through 2030, the end of the SDG period, and results were not discounted. Analyses were done separately in each of the 11 SEARO countries then aggregated.

With no additional action, premature NCD death rates in the SEARO region are expected to remain relatively constant through 2030. An approach using the 10 PHC interventions could reduce NCD mortality by 8.4% (realistic scenario) to 18% (ambitious scenario) by 2030, i.e., a quarter or just over one-half (respectively) of the reduction needed to achieve the target. Within PHC, aspirin for heart attack, treatment of chronic heart failure, and primary prevention of cardiovascular disease (CVD) would all cost under US$ 500 per disability-adjusted life-year (DALY) averted. Primary and secondary prevention of cardiovascular disease (CVD) would generate the greatest overall mortality impact; diabetes treatment would incur the greatest cost. Scale-up would require an additional US$ 52 billion (realistic) or US$ 100 billion (ambitious) cumulatively by 2030. Adding 9 secondary/tertiary care interventions to the PHC interventions would reduce NCD mortality by 12% (realistic) or 18% (ambitious) but add 30-40% to the PHC costs. Within secondary/tertiary care, treatment of acute heart failure, cervical cancer, and breast cancer would all cost under US$ 500 per DALY averted. Adding 6 intersectoral policies to the 19 clinical interventions would reduce NCD mortality by 18% (realistic) or 32% (ambitious), the latter nearly reaching the 3.4 target. These policies would incur modest additional costs, since they are mostly fiscal and regulatory measures (e.g., tobacco taxes, trans fat bans).

While it will be challenging to achieve SDG 3.4, countries that choose to prioritize and scale up NCD interventions can make meaningful progress on NCD mortality and Universal Health Coverage. We identified several highly cost-effective interventions that would be feasible to implement in any health system context. We also developed a web-based tool that can help support country-level prioritization and planning (URL available on request).

Ind-2288 Addressing the Non-communicable Disease Burden in South Asia: Priority Setting through Cost-effectiveness Analysis of Essential NCD Interventions

PRESENTER: **Krishna Kumar Aryal**
AUTHORS: Tarun Shankar Choudhary, Kjell Arne Johansson

Background: Non-communicable diseases (NCDs) contribute 53% of DALYs (range: 38% Afghanistan to 72% Sri Lanka) in South Asia. Reducing the burden of NCDs requires improving the universal health coverage (UHC) service coverage index, and countries in the region lie between 41 (Afghanistan) and 67 (Sri Lanka) while the global average is 68 out of 100. Reaching the 2030 SDG 3.8.1 target will require additional efforts in expansion of essential services including that of NCDs and reducing the burden of NCDs will require focusing on interventions that are highly cost-effective. We aim to assess the health impact of the NCD interventions by 2033 along with the budget impact and opportunity cost. We further aim to compare the results with a more cost-effective package. **Method:** We used the database built in the FairChoices disease control priorities (DCP) analytics tool developed by the University of Bergen in collaboration with University of Washington and analyzed a set of major interventions recommended by DCP3 and WHO UHC compendium. The input data used for the analysis are that of burden of disease, demography, unit cost of interventions and incremental cost-effectiveness ratio sourced in the database from relevant global sources. For the set of NCD interventions we used the most recent baseline coverage and then estimated 100% coverage by 2033 and analyzed cost-effectiveness of the NCD package. The outcome indicators used are lives saved and health life years (HLYs) gained. We present a preliminary analysis for Nepal and will further refine this analysis for all 8 countries in World Bank region of South Asia with additional interventions and updated data where available subsequently. **Results:** The current health expenditure (CHE) of 58$/capita will have to be increased by $630/capita in 10 years to achieve 100% coverage of the selected NCD interventions. This will result in 333,739 lives saved and 8.5 million HLYs gained but at an opportunity cost of 69,300 lives that could be saved from using a most cost-effective package. With a more cost-effective package by limiting incremental cost-effectiveness ratio threshold to 1,000$/HLY that includes the most essential NCD interventions as well as interventions for communicable diseases and maternal and child health, we will save 273,000 lives and gain 6.8 million HLYs at just an additional cost of 38$/capita. **Conclusion:** The required per capita cost of service coverage expansion to 100% is way above the CHE per capita but will result in only a slightly higher health gains and with an opportunity cost compared to a cost-effective package still yielding similar health gains. And the results for other countries in the region are expected to be similar. This analysis will help policymakers of the countries in the region to consider using a systematic priority setting approach to select the most essential NCD interventions to achieve maximum health benefits within limited fiscal space. **Keywords:** burden of disease, essential NCD interventions, health life years, lives saved, south Asia, universal health coverage

Ind-2491 Cost of Treatment for Diabetes Mellitus with Heart Complications: Indonesian National Health Insurance Participants in 2015-2021

PRESENTER: **Pujiyanto Pujiyanto**

In 2023 BPJS Health will spend more than IDR 23 trillion to cover heart disease. One of the risk factors for heart disease is diabetes mellitus (DM). DM can cause thickening of the walls of blood vessels, which can inhibit blood flow. Therefore, diabetesee are at higher risk of developing heart disease. To reduce the pressure of increasing costs for heart treatment, efforts are needed to reduce the rate of diabetesee who suffer from heart disease complications. To increase awareness of Indonesian National Health Insurance (NHI/JKN) participants regarding the magnitude of economic losses due to the costs of treating DM and heart complications, it is necessary to study the increase in DM treatment costs if they suffer from heart complications. The research was conducted using BPJS Health (the name of Indonesian National Health Insurance/NHI carrier) sample data which is panel data on health service utilization for NHI/JKN participants starting in 2015 and every year the number of JKN participants in the sample is increased. Since 2015, there have been NHI/JKN participants suffering from DM, even until 2021, but along the way there are also DM sufferers who experience complications of heart disease (as secondary diagnosis). The total sample using secondary hospital services (outpatient and/or inpatient) includes 47,118 individuals suffering from DM and 33,576 individuals suffering from DM with heart complications. In the 7 year observation period from 2015-2021 the average duration of DM treatment was 3.22 years (SD = 1.64) and DM with heart complication was 3.19 years (SD = 1.64). The average annual cost of hospital treatment (outpatient and inpatient) for DM patients is IDR 1,814,385 (SD = 3,409,819) and for DM with heart complication patients is IDR 11,304,138 (SD = 22,647,610). Multivariate analysis results prove that total medical treatment costs per year are influenced by age, gender, heart complications, duration of treatment, treatment class, and area of residence. Treatment costs for male patients and those living outside Java Island are lower compared to women and those living in Java Island. Interestingly, we found that the older the patient and the longer the duration of treatment, the lower the cost of medical treatment. And the dominant factor that influences the total cost of treating DM patients per year is the occurrence of heart complications. The cost of treating DM patients with heart complications per year is IDR 9,450,259 more expensive than those without heart complications. Research results prove that heart complication among diabetesee cause an increase of more than IDR 9 million in medical costs per year. Therefore, it is necessary to promote every effort to prevent or at least slow down the occurrence of heart complications among diabetesee in order to save on the national health insurance funds.

1:30 PM –3:00 PM TUESDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Nusa Dua

Social Determinants of Health and Quality of Care

MODERATOR: **Teguh Dartanto**, "Faculty of Economics and Business, Universitas Indonesia"

Ind-1358 Understanding the Underperformance of Minority Patient Outcomes at Minority-Serving Hospitals

PRESENTER: **Shane Murphy**, University of Connecticut
AUTHOR: Angela Saquinaula

ABSTRACT With a forecasted increase in ethnic and racial diversity in the United states, hospitals will see a more diverse mix of patients. As a result, addressing the lack of health equity across race and ethnicity is critical for future healthcare reform. The purpose of this study was to identify how the role of patient ethnicity/race on inpatient mortality varies depending on changes in the racial/ethnic composition of the hospital the patient is admitted to and the racial/ethnic makeup of the neighborhood around the hospital. Using inpatient data from hospitals in New York between the years 2005-2015 and patient-level data adjusting for patient morbidity severity, we consider six conditions: acute myocardial infarction, cerebral thrombosis/embolism, pneumonia, surgical complications, intestinal obstruction, and newborn care. Controlling for a number of key variables including patient illness severity, patient insurance type, and hospital specific variation, we find evidence that Hispanic patients had worse outcomes across two of the six conditions at hospitals that serve a higher proportion of Hispanic patients. In addition, for acute myocardial infarction, Black patients had worse outcomes at hospitals that serve predominantly Black patients, but had higher rates of survival for the other five conditions at hospitals that serve a higher proportion of Hispanic patients and are located in areas that have a large Black population. This relationship is not present in economic variables; for example Medicaid patients did not see significantly different outcomes at hospitals with different patient-ethnicity-profiles. This was robust to various measures of risk-adjustment, suggesting that the difference was not due to severity of the patient. It is also robust to adjusting for multiple-hypothesis testing. An important reason this is policy relevant is because it indicates that outcome disparities may be greater in facilities most likely to treat non-white patients.

Ind-1371 The Relationship between Disease and Income Inequality: National Level Analysis Using Linked Data from New Zealand

PRESENTER: **Philip Clarke**
AUTHORS: Finn Sigglekow, Tony Blakely, Sophie Cole, Laxman Bablani

Abstract

Background: Considerable interest exists regarding the extent to which income inequalities impact both population and individual health. While it is acknowledged that patterns of disease can also affect income inequality, few attempts have been made to quantify the overall relationship at a national level.

Aims: This study aims to quantify the degree of income loss associated with 12 disease categories (cancer, cardiovascular, endocrine, gastrointestinal, genitourinary, infectious, injury, mental health, musculoskeletal, respiratory, skin, reproductive, and sensory) and to estimate their impact on income inequality at the country level.

Methods: This analysis utilized individual-level data from New Zealand's Integrated Data Infrastructure (IDI), which links whole-population health and administrative tax datasets from government agencies via a population-level spine. The study included 22.5 million person-years of data (collected from 2007 to 2016), combining administrative tax records with hospitalisation data, cancer and diabetes registries, and mental health datasets. Disease-specific income losses were estimated using panel fixed-effects regression. Simulations assessed the within-person marginal effects of income changes associated with being diagnosed with, dying from, or being otherwise affected by each disease (compared to no disease). The regressivity of income loss by disease was quantified using the Reynolds-Smolensky Index.

Results: Income losses associated with having one or more diseases were regressive, ranging from a 7.5% loss in the most deprived quintile to 2.3% in the least deprived quintile. Simulations indicated that the absence of disease was associated with a 4.43% reduction in the Gini coefficient for personal (i.e. individual) income, from 0.549 to 0.525. Mental health disorders accounted for the largest contribution to the gap between actual and counterfactual income inequality (35%), followed by cardiovascular disease and musculoskeletal disorders (both 14%).

Discussion: These findings provide a national-level measure of the association between disease and income inequality, as well as the extent to which sickness benefits mitigate the economic impact of major health conditions. The feasibility of applying similar methodologies in other countries which have integrated administrative data will also be discussed.

Ind-255 The Impact of Economic Development on Distribution of Non-communicable Diseases?A National Longitudinal Data Analysis between 1991-2020 in China

PRESENTER: **Xuemei Zhang**
AUTHORS: Tianxin Pan, Barbara McPake

Background

Non-communicable diseases (NCDs) are major contributors to health burden globally, accounting for about 74% of global deaths each year. Notably, 77% of all NCD deaths occur in low-and middle-income countries (LMICs). As countries undergo economic transition from low income to upper-middle income and further, evidence indicate that the burden of NCD shifts from the rich to the poor and exacerbates health inequalities. This reversal, influenced by complex factors such as childhood socio-economic status (SES), environmental exposures, and changing behavioural patterns, underscores the urgent need to explore how economic development impacts health disparities. If NCDs become increasingly a problem for the poor, it is crucial to deconstruct this reversal by gender and social group and analyse its drivers to better protect disadvantaged groups, from bearing major NCD burdens in the future. However, existing evidence has largely relied on cross-sectional analyses across countries, with limited analysis on the dynamic trends at the subnational level within an individual country over time by using longitudinal data. China, with its significant burden of NCDs — which accounted for 90.99% of total deaths and 86.74% of disability-adjusted life years (DALYs) in 2021 — along with its rapid economic growth, large population size, and availability of large data sets, provides promising setting to explore these dynamics and address existing gaps.

Aim

This study aims to investigate how economic development influences the distribution and burden of NCDs across different populations in China, focusing on temporal trends and demographic variations.

Methods Utilizing 16 waves longitudinal data from the China Health and Nutrition Survey (CHNS, 1991-2015) and the China Family Panel Studies (CFPS, 2010-2020), we investigate the prevalence of the 87 types of NCDs across different SES groups (proxied by education levels, income, and household expenditure), gender and age. Multivariable logistic regression and Blinder-Oaxaca decomposition models are fitted to investigate the relationship and examine the possible contributors for the relationship. We further investigate the impacts of socio-economic status mobility on the development of NCD in different populations.

Results

Our final sample size is between 10,565 (1991) and 32,522 (2020) over waves. The NCD and education level analysis results shows that the prevalence of a list of NCDs in the overall population increased from 3.52% (1991) to 13.72% (2020). The association between SES and NCDs has shifted from positive to negative over time, shifting earlier among women compared to men. For both men and women, the difference in prevalence between high and low SES groups was mostly explained by the socio-demographic and risk behaviors variables included in the models: age, being overweight, employment status, residency, and region. However, the contribution size of these factors and consistency was different by gender and changed over time.

Conclusions

China has experienced a reversal in the education level-NCD gradient which occurred first among women. The explanations of education differences are differed by gender. Policymakers should consider these shifting patterns in health inequalities to develop effective strategies. Globally, the common drivers of shifting NCD burdens should be identified and strategies that target those drivers should be developed.

Ind-1463 Does Chronic Illness Lead to Early Retirement? Insights from the Longitudinal Ageing Study of India

PRESENTER: **Amit Kumar Goyal**
AUTHOR: Shamrin Akhtar

Background: Chronic illness profoundly impacts older adults, leading to early retirement, which burdens society through productivity loss and increased healthcare costs. Employees with chronic health disorders reported reduced productivity and more absenteeism, resulting in significant economic losses for firms. Furthermore, chronic diseases can cause fatigue, pain, and cognitive impairments, all of which can interfere with concentration and focus, lowering work performance. Individuals with chronic diseases have lower motivation and involvement in their work duties.

Objective: This study aims to investigate the association between chronic illness and early retirement among Indian older adults aged 45-64 years. It focuses on identifying which chronic conditions are most significantly associated with early retirement and explores the role of sociodemographic factors in this relationship.

Data: The study utilizes cross-sectional data from the Longitudinal Ageing Study in India (LASI), Wave 1, conducted in 2017-2018. The analysis includes 5,221 early retirees and 27,246 non-retirees aged 45-64 who provided self-reported health and retirement status data.

Methods: Descriptive statistics were used to compare sociodemographic characteristics and chronic disease prevalence between early retirees and non-retirees. Chi-square tests assessed the significance of differences between groups. Multivariate logistic regression models were employed to estimate the odds of early retirement associated with various chronic conditions and sociodemographic factors, adjusting for potential confounders.

Results: 17% of the older adults aged 45-64 retire early from economic activities. The analysis revealed that early retirees had a higher prevalence of chronic diseases such as hypertension (35.43% vs. 19.79%), diabetes (17.75% vs. 9.11%), chronic lung disease (8.22% vs. 3.62%), and stroke (3.94% vs. 0.75%) compared to non-retirees. The odds of early retirement increased with the number of chronic diseases: individuals with two chronic diseases had 2.82 times higher odds (95% CI: 2.09-3.80), and those with three or more had 2.83 times higher odds (95% CI: 1.79-4.45) of retiring early. Additionally, being female, widowed, or living in urban areas was associated with higher odds of early retirement.

Conclusion: Chronic diseases significantly contribute to early retirement among older Indian adults. The study highlights the need for workplace interventions and policies that support employees with chronic conditions to extend their work life and improve their quality of life.

Ind-2194 Effects of Health Care System Consolidation on Inpatient Care Quality: Evidence from a U.S. Military Health System Study.

PRESENTER: **Seungbeen Ghim**, "Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc."
AUTHORS: Patrick Richard, Jangho Yoon, Ara Yoon, Nilam Gibson, Daniel Gedeon

Aim: The 2017 National Defense Authorization Act heralded the modernization of the U.S. Military Health System (MHS), transferring

administrative authority over all military treatment facilities (MTFs) from military branches to a single entity under the Defense Health Agency (DHA) in three implementation phases. This study examined the effect of the system consolidation under the DHA on the quality of care** among hospital inpatients.

Methods: Quarterly inpatient event data were retrieved from the 2016-2023 military healthcare claims data repository (N=56). We excluded 16 direct care hospitals outside the US and three hospitals with missing transition dates. We created a propensity score-match sample using multivariate logistic regression that matched transitioned MTFs to the 100-nearest neighbors for two types of controls: 1) not-yet-transitioned MTFs (direct care) and 2) private care hospitals (purchased care) within a 40-mile radius of the transitioned facility. We performed a staggered difference-in-difference analysis on the matched facilities. Quality of care measures included length of stay, past 30-day and 60-day mortality, and past 30-day unplanned readmissions. Because we could not observe the characteristics of private care hospitals, we additionally stratified analyses by the type of MHS beneficiary (active duty service members [ADSM]; ADSM dependents; military retirees; and military retiree and survivor dependents) to account for any potential heterogeneity among hospitals.

Results: Across all implementation phases and beneficiary types, the MHS's administrative consolidation under a single entity did not significantly alter the quality of care trends in MTFs. However, trends changed within a few waves and for a few beneficiary types for mortality and unplanned readmissions. Transferring administrative authority to the DHA in Phase-1 was associated with 1.9% ($p<0.001$) and 2.1% ($p=0.01$) decreases in past 30- and 60-day mortality rates, respectively, among ADSM. On the other hand, the Phase-1 implementation was associated with an increase in the past 30-day mortality by 1.3% ($p=0.03$) among military retirees. The Phase-0 implementation was associated with a slight increase in the past 60-day mortality by 5.5% ($p=0.05$) among military retirees and survivor dependents. However, it was associated with a decrease in past 30-day unplanned readmissions by 3.0% among ADSM.

Conclusion: Modernizing the MHS through administrative consolidation of the system under a single entity improved the quality of care metrics for ADSM but worsened the quality of care for military retirees and their dependents. Future research should systematically investigate implementation phases that may contribute the most to worsened care (e.g., comorbidity identification and complication management).

Ind-2471 What do Patients Value in Healthcare Services? Examining the Link Between Clinical Competence and Patient Satisfaction in India

PRESENTER: **Maria Cellina Wijaya**, University of Ciputra
AUTHORS: Anuska Kalita, Kirti Gupta, Nachiket Mor, Annie Haakenstad, Arpita Chakraborty, Liana Woskie, Ms. Winnie Yip, Maria Cellina Wijaya

Patient satisfaction is increasingly used as a metric for healthcare quality in many systems, including India's. However, health economics literature highlights the challenges of information asymmetry and agency problems between patients and providers that might influence patient satisfaction. Empirical evidence on whether patients can evaluate and respond to better quality care remains inconclusive. While India has seen research on patient satisfaction and clinical effectiveness independently, few studies have examined their interrelationship or how patients' expectations shape provider behavior. This study addresses these gaps with three key questions: (1) Is there an association between clinical competence of providers and patient satisfaction? (2) What aspects of care determine patient demand and satisfaction? (3) How do providers respond to patient expectations? The analysis draws on the India Health Systems Reform Project, using data from Odisha, an under-resourced Indian state. Four linked surveys informed this study: 550 clinical vignette interviews to assess provider competence, surveys with 794 public-sector providers and 685 private-sector practitioners to examine provider characteristics, and 978 patient exit interviews capturing patient experiences. Descriptive analysis and regression models were used to explore associations between variables of interest. For research question (1), we found no significant association between clinical competence and patient satisfaction. Patients often rated care quality positively, even when providers demonstrated poor clinical competence in diagnosing and treating common illnesses. For research question (2), patient satisfaction was predominantly influenced by non-clinical factors. Patients were more satisfied with private-sector providers, those requiring longer travel, providers spending more time during consultations, and those prescribing branded over generic drugs. Satisfaction followed an inverted-U pattern, with the number of prescribed drugs, peaking at an average of 2.2 drugs per visit before declining. This suggests patients perceive an "ideal" number of drugs during outpatient visits, regardless of the clinical appropriateness of prescriptions. For research question (3), patient expectations significantly shaped provider behavior. Providers prescribed an average of 2.4 drugs per consultation, aligning with patient expectations. Notably, price was not linked to provider competence, but there was a negative association between competence and consultation time, with less competent providers spending more time with patients. These findings suggest that patients often favor irrational care and less competent providers who meet their expectations for time and prescriptions. While patient satisfaction is crucial for care utilization and trust in the health system, it may not reliably reflect clinical quality or value. This study highlights the complexities of using patient satisfaction as a quality metric, particularly in low-resource settings with high information asymmetries. Addressing gaps between patient expectations and clinical quality will require systemic efforts to educate patients, align provider behavior, and ensure that satisfaction metrics incentivize high-value care.

Ind-2748 A New Healthy Ageing Score: How Chronic Diseases Influence Outcomes among Older Adults in India

PRESENTER: **Shivani Kumaria**
AUTHOR: Ramna Thakur

ABSTRACT

Introduction:

Recent times have seen a dramatic increase in life expectancy, where people all over the world can expect to live way beyond the age of 60. However, merely increasing years to life is not sufficient. Emphasis should also be put towards living a healthy life specially in older ages. This

argument has led to the concept of Healthy Ageing. Over the years, various definitions of healthy ageing have emerged and one such definition is given by World Health Organization (WHO) which focuses on functionality of older adults rather than focusing only on the presence or absence of diseases. Keeping this viewpoint, this paper has made an index of healthy ageing by taking various dimensions of health namely, functional ability, intrinsic capacity and social participation of people who are above the age of 60. These factors are recognized as key contributors to an individual's overall health and functional ability, regardless of the presence or absence of diseases. Furthermore, this paper examines how specific chronic diseases impact our index, offering insights into their influence on functional capacity and overall well-being in older adults.

Method:

We have used data from the Longitudinal Ageing Study in India (LASI), wave 1, with which we created the index using the composite index methodology. The index was developed using 49 variables divided into three domains mentioned above, and the final scores were divided into three categories, with the lower category indicating poorer outcomes. The Cronbach's alpha was 0.88, indicating high internal reliability. Furthermore, we used multinomial logistic regression (with the middle category as reference) to examine how 10 chronic conditions, including hypertension and diabetes, influence the likelihood of achieving different levels of healthy ageing. The analysis controlled for socio-economic factors such as sex, religion, caste, education, working status, and place of residence.

Results:

Chronic conditions such as Chronic Obstructive Pulmonary Disease (COPD), stroke, bone diseases, and angina significantly increase the odds of being in category 1 (lowest healthy ageing scores), with stroke (Coefficient = 1.19, $p < 0.001$) and psychological disorders (Coefficient = 0.79, $p < 0.001$) having the strongest impacts. Education reduces the odds of being in category 1, with higher educational attainment showing a stronger protective effect. For category 3 (highest healthy ageing scores), diabetes, hypertension, and COPD significantly decrease the odds of scoring higher, while urban residence (Coefficient = 0.61, $p < 0.001$), higher education, and being currently working increase the likelihood. Females are more likely to score higher.

Discussion and Conclusion:

Chronic conditions like psychological disorders, hypertension, and COPD decrease healthy ageing scores, while higher education, urban residence, and being female enhance scores. These findings highlight the critical role of socio-demographic and health factors, offering insights for future research by focusing on diseases that significantly impact healthy ageing outcomes and exploring interventions to mitigate their effects.

Ind-2839 Geographic Disparities in Stroke Mortality: Examining Rural-Urban Trends and the Impact of the Stroke Belt

PRESENTER: **Mengyuan Cheng**
AUTHORS: Nasim Ferdows, Alireza Baghbanferdows, Amit Kumar

Stroke mortality remains a significant public health challenge in the United States, with persistent geographic disparities. While previous studies have documented the rural-urban gap in stroke outcomes, limited attention has been paid to the role of the "stroke belt," a region with historically high stroke mortality rates. Understanding how these disparities evolve over time and interact with regional factors provides important insights into health equity and resource allocation. This study investigates trends in age-adjusted stroke mortality, focusing on differences between rural and urban areas, and examining how these trends vary within and outside the stroke belt region. We conducted a cross-sectional analysis using data from the Centers for Disease Control and Prevention (CDC)-WONDER database from 1999 to 2022. This dataset includes county-level mortality data across the United States. For this analysis, we extracted stroke mortality rates for individuals aged 55 and older. Stroke mortality was identified using International Classification of Diseases, Tenth Revision (ICD-10) codes. County-level socioeconomic data, including per capita income and unemployment rates, were obtained from the Area Health Resources File (AHRF). Counties were classified as rural or urban based on the U.S. Department of Agriculture Rural-Urban Continuum Codes, and further categorized as being within or outside the stroke belt region. Age-adjusted stroke mortality rates per 100,000 population were calculated using the 2000 U.S. standard population. Analytical techniques included weighted regression models with county fixed effects to examine trends and disparities, adjusted for county-level socioeconomic characteristics. Nationally, stroke mortality rates declined substantially between 1999 and 2022. However, the rural-urban gap widened over time. In 2022, stroke mortality in the rural stroke belt remained notably higher compared to other regions, with rates approximating those of urban non-stroke belt areas in the early 2000s (around 40–45 deaths per 100,000 population). Similarly, rural non-stroke belt areas in 2014 had stroke mortality rates comparable to those observed in urban stroke belt areas nearly a decade earlier. Urban non-stroke belt counties exhibited the fastest declines, maintaining the lowest mortality rates throughout the study period. Adjusting for socioeconomic characteristics partially narrowed these disparities but significant gaps persisted, particularly in rural stroke belt areas. While stroke mortality rates have declined nationwide, disparities remain stark, with rural stroke belt counties lagging significantly. The observed trends suggest that rural areas, particularly within the stroke belt, are on a slower trajectory of improvement, maintaining mortality rates similar to urban non-stroke belt areas from 10–15 years prior. These findings underscore the need for targeted policy interventions to address geographic inequities in stroke prevention, acute care, and rehabilitation services. Strengthening healthcare infrastructure and access in rural and stroke belt regions is crucial to achieving equitable health outcomes.

Bali International Convention Centre – Jakarta A

Economic Evaluations and Global Health

MODERATOR: **Margarita de Vries Mecheva**,

Ind-3 Quantifying the Impact of Incorporating Hepatitis C Virus Transmissions in Indian Punjab for Model-Based Cost-Effectiveness Analyses of Treatment

PRESENTER: **Soham Das**
AUTHOR: Varun Ramamohan

Introduction:

Hepatitis C virus (HCV) infection in the state of Punjab in India is a major health economic concern due to its high prevalence and its sizeable impact on liver-related morbidities and mortality. In 2016, highly efficacious directly-acting antivirals (DAAs) were brought under price control to boost treatment uptake. Model-based cost-effectiveness studies of HCV treatment using DAAs in the Indian context do not consider disease transmissions. Thus, quantifying the underestimation of the cost-effectiveness of treatment can help understand the appropriateness of excluding transmissions in models assessing HCV treatment decisions. In this study, we estimate the underestimation of health and cost outcomes, and cost-effectiveness of DAA-based HCV treatment due to not incorporating disease transmission in model-based analyses.

Methodology:

An agent-based simulation model for HCV transmission was developed for a dynamic cohort and coupled with a previously published disease progression discrete-time Markov chain. Treatment strategies stratified by uptake rates (10%, 30%, 50%, 70%, 90% and 95%) were tested on this model using two scenarios- one with transmissions incorporated (WT* scenario) and the other with transmissions neglected (WoT scenario). Lifetime quality-adjusted life years (QALYs) and costs were estimated using a payer's perspective. Net monetary benefits were calculated as a measure of cost-effectiveness. For either scenario, the base case was the 10% uptake rate. Cost heads included disease complications and symptoms management costs for all infected patients and DAA treatment costs for treated patients. Disease complications and symptoms management cost-related data were obtained from our clinical collaborators in Dayanand Medical College in Punjab. All other modelling input data were obtained from the literature. For assessing cost-effectiveness, outcomes were annually discounted at 3|% and the cost-effectiveness threshold was taken as INR 341901. A theoretical framework was developed for deriving analytical results to study the relation between transmission dynamics, treatment uptake rates and underestimation of treatment benefits.

Results:

We quantified underestimation of the benefits of stepping up HCV treatment using three parameters: (1) ratio of incremental per-capita cost reduction for the WT scenario to the WoT scenario (Cost-WT/Cost_WoT) (2) ratio of contribution of QALYs (in monetary values) in the NMB for the WT scenario to the WoT scenario (QALY_WT/QALY_WoT) (3) ratio of NMBs for the WT scenario to the WoT scenario (NMB_WT/NMB_WoT). As the uptake rate increases from 30% to 90%, the Cost_WT/Cost_WoT ratio decreases from 3.22 to 2.03, the QALY_WT/QALY_WoT ratio decreases from 2 to 1.06 and the NMB_WT/NMB_WoT ratio decreases from 2.09 to 1.16. Analytical results showed similar trends- neglecting transmissions led to underestimation of QALY gains and cost savings achieved by increasing treatment uptake, but the scale of underestimation decreased with increase in treatment uptake.

Conclusion

Both simulation and analytical results demonstrate underestimation of health and cost benefits, and thus of net monetary benefits as treatment uptake increases. The underestimation decreases as uptake rates increase. As treatment uptake rates are low in Indian Punjab (<30%), hence our study shows that the incorporation of HCV transmissions in models assessing outcomes of HCV treatment becomes important for decision making regarding reimbursement of treatment.

Ind-375 Cost-Effectiveness of Bubble Continuous Positive Airway Pressure in Treating Severe Pneumonia and Hypoxaemia in Under-Five Children in Ethiopia

PRESENTER: **Firew Bobo**
AUTHORS: Abdi Gari, Peter Berman, Mirkuzie Woldie, Mohammod Chisti, Tsinuel Girma, Mideksa Adugna Koricho, Meseret Gebre, Girmaye Dinsa

Background: Pneumonia is preventable and treatable, yet it remains the leading infectious cause of illness and death among under-five children. Bubble continuous positive airway pressure (bCPAP) offers a promising treatment option for oxygen therapy when combined with appropriate antibiotics and other supportive care. However, the cost-effectiveness of bCPAP in resource-limited settings such as Ethiopia is not documented. We aimed to evaluate the cost-effectiveness of bCPAP compared to low-flow oxygen therapy in treating severe pneumonia and hypoxaemia in children under-five in Ethiopia. **Methods:** We developed a decision-analytical model to determine the cost-effectiveness of a locally made bCPAP compared with the standard of care (WHO-recommended low-flow oxygen therapy) in general hospitals. We adopted a restricted societal perspective, which includes all direct medical costs regardless of the payer. Effectiveness was measured as the number of child deaths and DALYs averted. Cost data were extracted from published literature, expert opinion, and local markets. The incremental cost-

effectiveness ratio (ICER) was calculated and evaluated against the willingness-to-pay (WTP) thresholds set at multiples (0.34, 1, and 3) of Ethiopia's GDP per capita, which was $856 in 2022. Sensitivity analyses were performed to test the robustness of the results. **Results**: For every 10,000 children with severe pneumonia and hypoxaemia, providing oxygen using locally made bCPAP will save an additional 31 children compared to the low-flow oxygen therapy. A locally made bCPAP has an ICER of 139.5 USD per DALY averted. These results were robust in the sensitivity analysis performed, showing a 100% probability of being cost-effective at one times the GDP per capita of Ethiopia. **Conclusion**: A locally made bCPAP is a highly cost-effective intervention for treating severe pneumonia and hypoxaemia in under-five children in Ethiopian general hospitals. **Keywords:** Cost-effectiveness, bubble Continuous Positive Airway Pressure, bCPAP, severe pneumonia, hypoxaemia, Ethiopia**

Ind-728 A Cost-Effectiveness Analysis of Performance-Based Financing in Jimma Zone, Ethiopia

PRESENTER: **Carmen Schakel**
AUTHORS: Maarten Oranje, Kaleb Melaku Woldemariam

BACKGROUND

Performance-based financing (PBF) is a provider payment mechanism that has been applied across many sub-Saharan African (SSA) countries. The approach promotes strategic purchasing and reimburses health facilities for the provision and quality of priority health services. Evidence of the cost-effectiveness of PBF still remains limited, with full economic evaluations having only been conducted in a handful of countries including Zambia, Zimbabwe, and Nigeria. This study aims to add to this evidence by evaluating the cost-effectiveness of implementing PBF in Jimma Zone, Ethiopia. The cost-effectiveness of PBF is assessed through a comparison with status-quo financing.

PBF was initially piloted in Ethiopia in 2015 and first introduced in Jimma Zone in April 2019 (in 13 districts). Based on promising initial results, the approach was then expanded to all 521 health posts, 121 health centres and 7 hospitals of the 21 districts of the Jimma zone in 2021. The primary aim was to improve service delivery through increased utilization and improved quality of health services. Other program aims were to strengthen local governance of service delivery and improve the quality of data for better decision-making by facilities and local health authorities.

METHODS

A cost-effectiveness analysis (CEA) was conducted to measure the effects of PBF compared to status-quo financing on health service provision using a health system perspective. The study included a sample of 14 health centers implementing PBF in Jimma zone and 10 health centers implementing status-quo financing in a control zone. Costs included were PBF program costs incurred from April 2019 to August 2022. Annual service utilization data was retrospectively retrieved for pre and post-intervention periods from September 2018 to August 2022 for five services: ANC1, ANC4, Skilled Deliveries, Full Immunizations and Vitamin A Supplementation. Using sub-national health statistics, service utilization was converted to coverage rates. Net effectiveness on service coverage was measured using a difference-in-difference method and was converted to the number of Lives Saved using the Lives Saved Tool. Lastly, lives saved were converted to quality-adjusted life years (QALYs).

RESULTS

In comparison to the control group, an estimated 51 lives were saved in the 14 health centers over the PBF implementation period. Raw PBF program costs were €0,96 per capita per year. After adjustments to the study sample and the five services modelled, this translated to €0.2561 (EUR 2019) per capita/year. QALYs gained were 1,108 per million population resulting in an incremental cost-effectiveness ratio of €233 per QALY (EUR 2019) for implementing PBF.

CONCLUSION

Compared with a cost-effectiveness threshold of 1.5 times Ethiopia’s 2019 GDP (i.e. €1,126), PBF in the Jimma Zone, Ethiopia proved very cost-effective at €233/QALY. Cautiously comparing to similar CEAs in other SSA countries, PBF in Jimma Zone also appeared cost-effective, whereby lower intervention effects were compensated by significantly lower intervention costs. Incentivizing health services which suffer from low service coverage appears most cost-effective, as it may be both more effective and inherently less costly due to lower incentive payments.

Ind-1552 Economic Evaluation of Biologic Therapies for Severe Asthma in Malaysia: Cost-Effectiveness Analysis and Policy Implications

PRESENTER: **Mohamad Baihaqi Mohamad Basri**
AUTHORS: Khairil Idham Ismail, Izzuna Mudla Mohamed Ghazali

Background

Severe asthma remains a significant global health concern, with a substantial economic burden on healthcare systems, particularly in countries like Malaysia. Despite standard treatments being effective for many patients, a subset continues to experience uncontrolled symptoms, leading to frequent exacerbations and a high utilisation of healthcare resources. Biologic therapies have emerged as a promising treatment for patients with severe asthma, specifically targeting those with the Type 2 eosinophilic phenotype. However, the economic implications and cost-effectiveness of integrating these biologics into the Malaysian healthcare system remain underexplored. This study filled this gap by conducting an economic evaluation comparing the addition of biologic treatments to the standard of care (SoC) for severe asthma patients from the perspective of Ministry of Health Malaysia. The SoC followed the Malaysia’s Clinical Practice Guidelines (CPG) of Management of Asthma 2017.

Aim

The aim of this study was to estimate the cost-effectiveness of four biologics—tezepelumab, benralizumab, mepolizumab, and dupilumab—when added to the SoC for treating severe uncontrolled asthma patients, and to calculate the incremental cost-effectiveness ratios (ICERs) for each biologic compared to SoC alone.

Methods

A Markov cohort simulation model was employed to estimate the lifetime costs and quality-adjusted life years (QALYs) associated with each treatment strategy. The model included five health states: day-to-day symptoms, oral corticosteroid burst, emergency department visit, hospitalization, and death. Transition probabilities, treatment doses and effectiveness data were derived from local literature and clinical trials, while costs were estimated based on local healthcare utilisation and drug prices. In addition, deterministic and probabilistic sensitivity analyses were conducted to determine the robustness of the results. Three scenario analyses were illustrated by varying the duration of treatment, dose frequency and drug cost.

Results

The results indicated that the addition of biologics to the SoC increased both costs and QALYs gained. Among the biologics, benralizumab had the lowest ICER of $135,277 per QALY gained, followed by dupilumab ($191,632), tezepelumab ($164,598), and mepolizumab ($334,650). However, all ICERs were above the willingness-to-pay (WTP) threshold of $11,895 per QALY, suggesting that the biologics, while potentially beneficial in terms of clinical outcomes, may not be considered cost-effective in the Malaysian context without further price reductions. Both sensitivity analyses confirm the robustness of the results. A cost-effectiveness acceptability curve showed at the threshold of $216,825 (MYR 1 Million), the probability of cost-effectiveness was the highest for benralizumab (91.2%), followed by tezepelumab (88.3%), dupilumab (67.3%) and mepolizumab (3.9%). The scenario analyses demonstrated that reducing treatment duration, increasing dose intervals and significantly lowering drug costs could greatly enhance the cost-effectiveness of the biologics.

Conclusion

The findings have important policy implications, highlighting the need for further exploration of cost-reduction strategies, such as adjustments in drug pricing or treatment duration, to improve the affordability and cost-effectiveness of biologics in severe asthma treatment. Additionally, the study underscores the need for health policymakers to consider both clinical effectiveness and economic feasibility when incorporating biologics into national treatment guidelines.

Ind-316 Improved Cost-Effectiveness Thresholds for Global Health Decision-Making

PRESENTER: **Andrew Wang**
AUTHORS: Caroline Tangoren, Savannah Newman, Mark Minnery, Julianne Bruggemann, Sindhika Jai, Philip Riegert

Background: In resource-constrained settings, cost-effectiveness analysis (CEA) using averted disability-adjusted life-years (DALYs) is an important decision-making tool for prioritizing potential global health interventions, including by national governments, large-scale funders, and academic institutions. However, establishing appropriate cost-effectiveness (CE) thresholds remains challenging due to limitations in data, applicability across a wide range of contexts as a standard, and differences in perspectives. The widely used World Health Organization (WHO) Choosing Interventions that are Cost-Effective (CHOICE) initiative's approach, which defines thresholds relative to GDP per capita, has been criticized as too lenient and not applicable across diverse contexts. A more nuanced approach could improve resource allocation in low and lower-middle income countries (LICs and LMICs) by applying CE thresholds alongside a wider set of criteria for decision-making, benefiting stakeholders at all levels of global health decision-making. **Objective:** This study proposes a more conservative, geography-agnostic CE thresholding methodology for evaluating prospective health programs in LICs and LMICs, and examines the broader role of thresholds in decision-making processes across various global health sectors. **Data and methods:** We conducted a literature review to evaluate critiques of the existing WHO-CHOICE approach. Data on GDP per capita was collected across all LICs and LMICs, excluding countries determined to be infeasible for prospective program implementation at the current time. Using descriptive statistics, new thresholds based on a more conservative ½ GDP per capita metric are proposed, allowing for comprehensive evaluation across diverse contexts, interventions, and decision-making perspectives. We then evaluated prospective and ongoing interventions within our organization using CEA, validating cost per DALY averted metrics against the proposed CE thresholds. **Results:** We offer a new geography-agnostic thresholding methodology and identify potential exemptions to where the threshold cannot be rigidly applied. Exemptions include: 1) Programs with high levels of sensitivity or uncertainty; 2) Interventions likely to undergo significant design changes; 3) Programs with substantial non-health benefits; 4) Alignment with national or global health priorities; 5) Emergency response scenarios. The research emphasizes context-specific thresholding, highlighting the need for empirical estimates of opportunity cost, including willingness-to-pay (WTP) and value of statistical life (VSL) considerations. A two-step approach is recommended: first applying the geography-agnostic threshold, then considering context-specific factors. **Conclusions:** This research addresses limitations of current CE threshold approaches in global health decision-making. The proposed conservative, nuanced, and flexible methodology offers several advantages: 1) Supports improved resource allocation for large-scale funders working across a range of geographies and program areas; 2) Increases attention to context-specific factors for implementing organizations; 3) Promotes evidence-based practices in academic research and implementation. Adopting this refined approach to CE thresholds as part of a broader set of criteria for decision-making – recognizing the inherent uncertainty of CEA estimates – can help global health actors maximize the impact of limited resources, leading to more effective health interventions in LICs and LMICs.

Bali International Convention Centre – Jakarta B

Improving Equity in Health Care Financing

MODERATOR: **Tushar Mokashi**,

Ind-1039 Equity in Primary Care Financing: Heterogenous Benefits from Needs-Based Payments to General Practices in England, 2014-2022

PRESENTER: **Charlene Lo**
AUTHORS: Ms. Laura Anselmi, Matt Sutton

Background: Previous studies suggest that primary care provider payments should be allocated through a blended payment mechanism, with need-based capitation at its core. However, there is limited empirical evidence on whether this mechanism effectively promotes equity and whether targeting resources to areas with greater needs results in the desired outcomes. Most studies examining financing equity have assessed differential benefits as service use by socio-economic status, often overlooking patient outcomes, variations in the distribution of need and changes over time.

Objectives: We aim to (1) assess income-related horizontal equity in payments to primary care providers over time, in total and by scheme; (2) evaluate the heterogenous impact of payments on outcomes across populations with varying levels of need in the National Health Service (NHS) in England.

Methods: We used data on annual payments to 7,765 general practices in England from 2014 to 2022, linked to patient characteristics. We measured need in two ways: (i) expected utilization, based on a primary care needs index; and (ii) expected care burden from diagnosed morbidity, based on a hospital care needs index. We ranked practices by the average neighbourhood income of their patients in 2019, we computed concentration indices for both need and need-standardized payments were calculated, and we decomposed the concentration index into need, socioeconomic (income, education, ethnicity, economic activity, rurality), and supply-side factors (practice region, dispensing status, contract type). We used longitudinal regression models with Correlated Random Effects to assess the marginal effects of payment on healthcare outcomes (GP and nurse visits and patient satisfaction) across need quintiles, controlling for patient and practice characteristics.

Results: Need was concentrated among poorer populations for both measures: expected utilisation (concentration index (CI) = -0.0169) and expected care burden from diagnosed morbidity (CI = -0.0097). Total payments were consistently pro-rich, with the highest inequity when need was defined by expected utilization (horizontal inequity index (HI) = 0.0224) followed by expected care burden from diagnosed morbidity (HI = 0.0148). Inequity varied across payment schemes, ranging from pro-rich (HI = 0.0399) for the Minimum Practice Income Guarantee to pro-poor (HI = -0.0938) for the Personal Medical Services expenditure. Both socioeconomic and supply-side factors contributed to pro-rich inequalities in payments. A £1 increase in payment was associated with a reduction in GP visits (0.07%) and nurse visits (0.13%) across all five need quintiles, with these reductions being more pronounced in the higher need quintiles. The same increase in payment was associate with improvements in patient's overall experience (0.03%) and their experience of GP access (0.01%), with these positive effects being more pronounced in the higher need quintiles.

Conclusion: Populations with equal healthcare needs did not receive equal payments across income levels. To reduce horizontal inequities, resource distribution objectives should be clearly defined and harmonized across schemes. Future analysis will use more comprehensive and precise and updated need indices, additional health outcomes in a shorter time period (e.g., health status, healthcare experience).

Ind-1045 An Application of Capacity to Benefit as a Measure of Need: Equity in Payment to Primary Care Providers in England, 2019

PRESENTER: **Charlene Lo**
AUTHORS: Matt Sutton, Ms. Laura Anselmi

Background: Primary care resources should be allocated based on population healthcare needs, making it essential to explicitly recognize variations in these needs. The concept of "capacity to benefit" has been proposed as a theoretically suitable measure of need, supporting resource allocation that aligns with both equity and efficiency. This measure reflects the potential health gains an individual could achieve from healthcare services. However, it is rarely used in empirical studies to allocate resources across service delivery units based on population characteristics. Challenges include achieving consensus on its conceptual definition and identifying reliable data for measurement. As a result, studies often turn to approximate capacity to benefit using either a utilization-based or an epidemiological approach.

Objectives: We aim to (1) demonstrate a method for measuring capacity to benefit across service delivery units; (2) assess income-related inequality in capacity to benefit; (3) compare income-related inequality in capacity to benefit with inequalities in demand, utilisation, and diagnosed morbidity; (3) evaluate income-related inequity in past primary care payments. We apply these measures in an equity study in English National Health Service (NHS).

Methods: We used data on payments to 6748 general practices in England in 2019 linked to information on practice patients' average neighbourhood characteristics. We measured capacity to benefit as average health gains in terms of Quality-Adjusted Life Years (QALYs) per patient at the practice level in two steps. First, we obtained age-sex-specific prevalence of 20 diseases at the practice level. Next, we linked the health effect of these conditions (as classified by International Classification of Disease (ICD) codes) with their prevalence at each practice. We

measured income using the average neighbourhood income deprivation of practice patients. We compared the income-related inequality in capacity to benefit to that of alternative need measures used in previous studies, including (1) demand for care, (2) actual utilisation, (3) expected utilisation, (4) diagnosed morbidity, and (5) expected care burden of diagnosed morbidity. We measured horizontal inequity calculating the concentration index of indirect need-standardized payment.

Results: Of the 1,562 ICD codes, we mapped 154 to the 20 conditions monitored in primary care, capturing 16.7% of the total estimated health effect. We found that capacity to benefit was slightly concentrated among the lower-income individuals (Concentration index (CI) = -0.0179, $p < 0.0001$), making it the most pro-poor distribution among all need measures. However, payments were pro-rich when using capacity to benefit as the measure of need (CI = 0.0122, $p < 0.001$, a trend consistent across all need measures.

Conclusion: We advocate for allocating primary care payments based on individual capacity to benefit, directing resources toward those likely to experience the most significant health gains. This approach maximizes efficiency while promoting horizontal equity, ensuring that individuals with similar potential for health benefit receive equal resources regardless of socioeconomic status.

Ind-2382 Social Preferences in Health Care Financing: Evidence from the SOPHEA Survey

PRESENTER: **Florence Jusot**, Université Paris Dauphine
AUTHORS: Beka Lomidze, Clémence Thébaut, Jerome wittwer

Background Equity in healthcare financing is one of the main objectives of modern healthcare systems. In this regard, the vertical and horizontal equity are often considered as the relevant fairness principles to assess equity in healthcare financing. These equity principles come from the fiscal theory literature. horizontal equity requires that people in equal positions should be treated equally which means, in the health context, that individuals with the same ability to pay should equally contribute to health spending, independently from healthcare use. Vertical equity considers how differently should people in different positions be treated, which means that individual contributions to health spending should be related to their ability to pay. However, little literature exists on the empirical assessment of the general population's adherence to those principles of equity in healthcare financing. **Research question and aim** We aim to fill that gap by assessing the public's adherence to the principle of horizontal equity in financing (HEHF) and to the vertical equity in healthcare financing (VEHF). **Data and Methods** Using an experimental survey with 3756 respondents representative of the French population, we measure adherence of the general population to the principles of HEHF and VEHF in the fields of both healthcare and long-term care. Respondents take the role of a social arbiter and allocate the public budget among four hypothetical individuals to compensate their healthcare expenses. Due to the scarcity of the public budget, respondents have to allocate out-of-pockets between the individuals. Using the random allocation of the scenario, we test the sensitivity of their adherence to the HEHF principle to three different causes of healthcare cost: severity of health conditions, preferences on types of healthcare providers, and place of residence. We explore the respondent's heterogeneity of adherence in accordance to age, sex, political orientation, beliefs about the causes of severe illness and others. We explore the sensitivity of individuals' adherence to HEHF and VEHF to the level of income of the four hypothetical individuals. **Results** We find a strong preference for the principle of HEHF when healthcare costs differences are due to differences in severity of health status. Respondents deviate when healthcare costs differences are due to differences in hypothetical choices of providers. When hypothetical individuals differ both in healthcare costs and income we find less adherence to HEHF while a significant share of respondents prefer budget allocation favoring people with low income. We found no individual heterogeneity across gender, political beliefs and socio-economic status. **Policy Implications** This study shows that the general public do not necessarily align with normative principles proposed by the normative litterature. However public support is necessary for a welfare system to be politically supported and to thrive. Those results provides arguments for the design of healthcare financing reform in the French context, the French general public asking for a compensation of extra costs due to circumstances and for income redistribution.

Ind-1907 Can Free Healthcare Policies Sustain Equitable Public Health Spending for Primary Care in Fragile Settings? Novel Evidence from Burkina Faso

PRESENTER: **Ms. Manuela De Allegri**, University of Heidelberg
AUTHORS: Thit Thit Aye, Laurène Petitfour, Mariam Seynou, Valery Ridde, Mr. Joël Arthur Kiendrébéogo, Hoa Thi Nguyen, Emmanuel Bonnet

Background: Countries around the globe are committed to foster Universal Health Coverage through the expansion of social health protection measures, implemented either as free healthcare policies or subsidised public health insurance schemes. While evidence on the effectiveness of these policies on facilitating access to care and enhancing financial protection is increasing, limited evidence persists on how equitably governments allocate the resources earmarked for these policies. In particular, distributional incidence analyses of universal health coverage policies are particularly sparse in fragile settings, i.e. countries affected by socio-political instability and conflict. Moreover, existing analyses rely on national-level aggregated data to estimate government subsidies to UHC policies, hereby masking important underlying inequities in resource allocation across regions and districts.

Objective: To overcome existing knowledge and methodological gaps, we conducted a benefit incidence analysis of the free care policy (*gratuité*) in Burkina Faso, a country affected by socio-political instability, building on disaggregated data tracing resource allocation to the single heath facility. We examined resource allocation across regions and levels of care for both children curative health services and obstetric care.

Methods: We combined multiple secondary data sources. We computed subsidy rates using *gratuité* program database. This database contains all claims filed and all payments made from the *gratuité* program to the single facilities, allowing for later aggregation at regional level. We derived health service utilisation for both child health services and obstetric care from the latest DHS round (2023) and categorised it by socio-economic quintile. We applied standard Benefit Incidence Analysis methods to examine both resource allocation by region and by level of care and distributional benefits across socio-economics groups, separately for child curative services and obstetric services.

Results: More than 80% of the *gratuité* funding allocated to the regions for child services reached primary health facilities, while only 60% of the funding allocated for obstetric services did. We observed important variations in resource allocation across levels of care across regions. Similarly, the unit subsidies received by the single regions differed substantially, with the subsidy for a child outpatient visit ranging from 852 to 1554 CFA (1 euro = 655 CFA) and 3422 to 6779 CFA for a normal delivery. While utilisation patterns for child services did not appear to differ substantially across socio-economic groups, important differences emerged once unit subsidies were factored in, with inequities in the distributional incidence becoming apparent even at primary level (concentration index 0.0266, p-value = 0.010). Inequities in the distributional incidence of obstetric care were even more pronounced, especially at secondary level (concentration index 0.4853, p-value = 0.000).

Conclusion: While the *gratuité* policy has been praised for sustaining high coverage rates and ensuring financial protection even in times of socio-political instability, our analysis shows that the policy, based on retrospective payments, reinforced existing inequalities, especially at secondary level. Our findings speak in favour of introducing prospective payment mechanisms, with a fixed fee structure to be agreed upon ex-ante with healthcare providers as means to promote greater equity in resource allocation.

Ind-1334 Informal Payments for Healthcare at Public Health Facilities in Kenya: Influencing Factors and Effects on Equitable Access to Care

PRESENTER: **Evelyn Kabia**, KEMRI Wellcome Trust
AUTHORS: Edwine Barasa, Dina Balabanova, Eleanor Hutchinson

Background: Informal payments are payments made by a patient to a health provider in addition to the officially determined service fees. They are considered a form of petty corruption. In 2021, 15% of Kenyans had paid informally to access health services at public facilities. Informal payments slow progress toward universal health coverage because they limit access to care and expose individuals to financial hardship. The design of effective strategies to address informal payments requires a good understanding of context-specific drivers and this evidence is limited within the Kenyan context. This study examined the supply-side, demand-side, and contextual factors influencing informal payments at public health facilities in Kenya and their effects on equitable access to care.

Methods: We conducted a qualitative study at 8 public health facilities (4 hospitals and 4 health centres) in two counties (urban and rural). Study participants were identified through purposive sampling. We conducted 8 focus group discussions (4/county) with 79 patients seeking different health services, and in-depth interviews (n=35) with health workers, non-clinical staff, and county and sub-county health managers. Data were analyzed using a thematic approach.

Results: Regarding the supply-side, charging of informal payments cut across most services. However, they were more common for: services that were charged user fees compared to free services, outpatient, specialist, pregnancy termination, and non-routine/seasonal services such as voluntary medical male circumcision, especially at primary health facilities. Low, delayed, and lack of salaries for some cadres such as community health volunteers, delayed and unfair promotions, understaffing, poor working conditions such as long working hours, and individual morals were the main human resource factors reported. There was overt collaboration mainly across cadres to charge informally. We found informal charging to be more likely at health facilities with high patient workloads, long waiting lists, especially for specialized services, inadequate supervision, and those that lacked drugs/supplies/services. Informal charging was also more common at public, urban, and higher-level facilities. On the demand side, patients paid informally to access services/drugs/supplies, to receive higher quality care mainly through reduced waiting times, and to reduce financial hardship from health costs, for example, by paying reduced inpatient bills. Within the broader context, widespread corruption within the public sector, lack of/inadequate sanctions, and harsh economic times influenced informal charging. The inability to pay informally exposed patients to injustices in access such as delayed/denial/foregoing of care and discrimination based on ability to pay. Informal payments exposed vulnerable groups especially the poor and informal sector members to financial hardship.

Conclusions: Factors associated with informal payments were largely linked to health system inadequacies and inefficiencies in health financing and governance functions. Policy considerations that can reduce health inequities associated with informal charging include increasing public spending to ensure the availability of services, commodities, and human resources while ensuring fair remuneration and strengthened oversight. Enhancing public awareness of service entitlements, costs, and grievance redress mechanisms, and ensuring the latter are effective are also crucial.

1:30 PM –3:00 PM TUESDAY [Health Beyond The Health System]

Bali International Convention Centre – Nusantara 1

Risk at the Individual and System Level - Micro and Macro Analyses

MODERATOR: **Diego Cerecero-Garcia**,

Ind-681 Transnational Lifelines: The Role of Diaspora Capital on Health System Resilience in Fragile and Shock Prone Settings

PRESENTER: **Sophie Witter**, Queen Margaret University Edinburgh
AUTHORS: Alaa Dafallah, Karin Diaconu, Ayesha Koker, Ghanshyam Gautam, Salim Adib, Kyu Kyu Than, Rouham Yamout, Thazin La, Halimatu Kamara

Introduction: Fragile and conflict-affected states face severe health system challenges that diminish the capacity of the health system to

respond and adapt in crisis to ensure delivery of essential health services. Diaspora play a significant role in supporting healthcare and health systems globally. However, their contributions to resilience of health systems, particularly in fragile and shock prone settings, remain underexplored. This study aims to explore how diaspora capital —human, social, and financial —and policy engagement influence health system functioning in fragile contexts, contributing to overall resilience.

Methods: We conducted a multi-country mixed methods study in 5 fragile and shock prone settings: Nepal, Myanmar, Lebanon, Sierra Leone and Sudan to examine the role of diaspora capital and contributions on health system resilience capabilities. In the first phase of the study, a comprehensive literature and document review was undertaken both globally and at country level, analyzing diaspora capital sources, support pathways, engagement modalities, impacts, and opportunities. The quantitative component explored associations between diaspora financial contributions, particularly remittances, and health expenditure and utilization using descriptive analysis. The qualitative phase involved 60 semi-structured interviews across the study countries with diaspora association leaders, government officials, health providers, and academics to capture insights into forms of support, engagement modalities, and perceived barriers or impacts. Additional interviews were conducted globally with subject-matter experts and representatives of multilateral organizations or think tanks working in this area. Data was analyzed using thematic framework analysis applying both deductive and inductive approaches. Findings from each stage were triangulated and synthesized, with workshops held to validate results.

Results: Our results show that diaspora have significant influence pathways that contribute to resilience of health systems both through state and non-state provision. Diaspora financial contributions through remittances are one of the largest sources of external financing for fragile states and contribute positively to household expenditure on health. Non-remittance financial contributions e.g. in-kind contributions and philanthropy such as medicines and medical supplies are equally important pathways of contribution in crisis. Other forms of diaspora capital are emerging. Diaspora human capital contribute to availability and capacity of human resources through short term missions during crisis and medical training and skill transfer programs. Similarly, diaspora yield social capital through strong social networks and values such as trust and solidarity to informally and directly support affected communities during crisis. Social media and technology facilitate diaspora contributions that leverage community capabilities and responses in crisis. We present a novel conceptual framework mapping diaspora capital flow to specific health system resilience capabilities and develop recommendations for strengthening the role of diasporas in supporting country of origin health system resilience.

Conclusion: This study highlights important resource flows through which diaspora capital —human, social, and financial — contribute to health system resilience capabilities in fragile and shock prone settings. As climate threats, epidemics, and conflicts increasingly strain health systems particularly in fragile settings, leveraging diaspora capabilities through adaptive policy is critical for progress towards universal health coverage and health security.

Ind-1240 What Explains Ethnic Inequalities in Healthcare Quality and Access? Evidence from 38 Low- and Middle-Income Countries

PRESENTER: **Diego Cerecero Garcia**
AUTHORS: Thomas Hone, Aldina Mesic, Paraskevi Seferidi

Background: Ethnic inequalities in access to high-quality health services are large and unjust. They often reflect stark inequalities in socioeconomic status. However, many health systems fail to address the specific needs of different ethnic groups, which can further contribute to poor health outcomes in more disadvantaged groups. The extent to which socioeconomic factors explain inequalities in access and quality across ethnic groups, and how much remain of these inequalities remain unexplained, has not been comprehensively explored before. **Research question:** How much do socioeconomic factors explain inequalities in healthcare quality and access in low- and middle-income countries? **Methods:** Data from 38 Demographic and Health Surveys (DHS) were compiled, including information on antenatal care use, socioeconomic factors (education, wealth quintile, urban/rural location, age, and marital status), and ethnic group. Ethnic groups were based on country-specific classifications. Antenatal care quality and access scores (ANCq) were generated (range 0-10). The ANCq scores were based on the number and timing of antenatal care visits, if visits were with skilled providers, if key tests (blood pressure) and samples (urine and blood), and if tetanus injections were given. Blinder–Oaxaca decomposition was used to quantify differences in ANCq between ethnic groups within countries and estimate how much of these inequalities were explainable by socioeconomic factors. **Results:** Responses from 270,786 mothers from 319 ethnic groups in 38 LMICs were analysed covering the period 2000-2019. The mean ANCq score was 6.03 (95%CI: 6.01-6.05) which ranged from 2.65 in Niger (2006) to 8.50 in Colombia (2015). The mean difference in ANCq scores across ethnic groups (compared to the ethnic group with the highest ANCq score in each country) was 1.13 (range:0.11-3.44). In decomposition analyses, the percentage of this difference that could be explained by socioeconomic factors was on average 47.7% (mean of ethnic groups). In 22 countries, over 50% of the ethnic inequalities in ANCq were not explainable by socioeconomic factors. **Discussion/conclusions:** Ethnic inequalities in antenatal care access and quality are large within LMICs. Over 50% of the inequalities between ethnic groups were not explainable by observed socioeconomic factors suggesting other unobserved factors, cultural factors, and structural factors (including the provision of healthcare services) play an important role in explaining ethnic inequalities in antenatal care access and quality.

Ind-1546 How Corruption Affects Population Health

PRESENTER: **Sotiris Vandoros**
AUTHORS: Elias Mossialos, Ilias Kyriopoulos, Dimitrios Minos

The role of institutions in population health has attracted a lot of attention in the literature and previous findings also suggest that there is an association between corruption and health. However, little is known on any causal effects. The objective of this study is to explore the impact of corruption on population health using an instrumental variable approach. We used annual aggregate data on mortality and other health outcomes, as well as corruption, from 104 countries over the period 2008–2018, derived from the World Bank database, and employed country-level panel data instrumental variable approach to predict contemporary corruption levels. We used an instrument designed to capture the

historical and cultural origins of corruption, derived from a novel dataset of folklore-based measures of historical attitudes, drawn from previous work in the fields of economics and anthropology. The first stage results suggest that the number of corruption-related motifs is a strong predictor of contemporary corruption levels. Our instrumental variable regressions establish a robust and significant effect of corruption on mortality and other health outcomes. Our findings are robust to a number of different specifications, health outcomes, and proxies for corruption. We additionally delve into potential mechanisms, demonstrating that corruption erodes fiscal capacity and government capability to fund healthcare, while distorting the distribution of government expenditure. Furthermore, we demonstrate that it results in the misallocation of government resources, ultimately leading to reduced public funding for healthcare. Our analysis also emphasizes the role of public goods provision, revealing a more pronounced link between corruption and mortality in countries with lower levels of public goods provision. This suggests that corruption may hinder population health through inefficiencies in the allocation of public funds, and calls for action to tackle corruption globally, as yet another means to improve population health. **JEL Classification:** I10, D73, H51 **Keywords:** mortality, population health, corruption, institutional quality, public goods**

Ind-2283 Development of the COVID-19 Health Capability Profile and Index: A Quantitative Study in Germany, South Korea, Taiwan and the United States

PRESENTER: **Marion Coste**
AUTHOR: Jennifer J Prah

Background

The global pandemic of the COVID-19 has underscored the necessity to develop a comprehensive and multidimensional inquiry into the factors that contribute to one's ability to be, and remain, healthy in the context of a global pandemic. The health capability profile (HCP) enables such an examination. It identifies eight individual abilities (internal health capabilities) and seven societal abilities or conditions (external health capabilities), which, together constitute people's ability to effectively achieve optimal potential health. Previous empirical applications of the HCP have either been incomplete (i.e. documenting only several health capabilities in India in relation to political participation) or developed at a local scale (i.e. a mixed methods study on chronic hepatitis B conducted in a rural area of Senegal). Research question/aim This study presents the development of the empirical application of the HCP to COVID-19-related health capabilities in Germany, South Korea, Taiwan, and the United States into a COVID-19 health capability profile and index.

Methods

A quantitative survey was developed to document all dimensions and factors of the HCP at the individual level, and in relation to the COVID-19 pandemic. The survey contained several questions for each of the fifteen health capabilities. Questions were designed to assess the health capabilities' levels of development, for example using Likert-type scales or through categorical variables (rather than binary ones). The survey also documented standard individual socio-demographic and economic information. The online survey was administered to a nationally representative (for age, gender, and region) sample of adults in Germany, South Korea, Taiwan and the United States (n=1,000 per country). Individual data are aggregated into (1) a **health capability profile** of scores on a scale of 0-100 for each of the 15 health capabilities, and (2) a score on a scale of 0-100 for overall **health capability index**.

Results

Preliminary results for all 4 countries are presented, including the distribution and means of the fifteen health capability scores, the distribution of these scores in terms of levels of development, and the distribution and means of the health capability profile indices. These findings reveal substantial differences in the levels and distributions of the health capability scores within and across countries and demonstrate the richness of information provided by a cross-country quantitative application of the health capability profile.

Conclusions and implications for policy and practice

This empirical application of the Health Capability Profile contributes a prototype for future applications validating multidimensional metrics and multilevel analysis. Unlike conventional metrics such as life expectancy or QALYs, the profile captures a holistic picture by integrating internal abilities and external conditions. It offers policy-relevant insights both ex-ante (identifying vulnerabilities and strengths) and ex-post (evaluating the fairness and effectiveness of interventions). This approach emphasizes individual agency while enabling international and macro-level comparisons, which could be used to inform the design of equitable health policies and track progress over time in diverse contexts.

Ind-2789 Potential Lives Saved by Vehicle Standards in G-20 countries

PRESENTER: **Andres Vecino**
AUTHORS: Safyya Cisse, Elliana McGovern, Sagnik Ray, Abdul Bachani

Background: G-20 countries account for 59% of global traffic fatalities, nearly 800,000 deaths annually. Vehicle safety standards (VSS) are one of the strategies in the Safe Systems approach toolkit to improve road safety. Despite current innovations and regulations on VSS, many vehicles produced fail to meet minimum safety standards. Several countries within the G20 have not fully applied all vehicle safety regulations to date. **Aim:** This study estimates the potential effect that introducing and implementing vehicle safety standards in G-20 countries would have in terms of lives saved. **Methods:** In this work, we 1) conducted a literature review to obtain parameters of the impact vehicle standards have on mortality and 2) developed a comparative risk assessment model to estimate the potential gains in terms of lives saved from implementing standards in G20 countries. For (1), we conducted a literature review to identify the effect sizes of the impact of each VSS on mortality. We also used data from the Global Burden of Disease study, as well as annual sales and vehicle registered data to use as inputs in the model. Then, we conducted a deterministic comparative risk assessment model to estimate the effect on lives saved that a change in the distribution of the

exposure to VSS (seat belt usage, child seats, side impact protection, frontal impact protection, pedestrian protection, automatic emergency braking, motorcycle anti-lock breaking system, intelligent speed assistance, and electronic stability control) may have towards 2030 and 2050. Some assumptions were made and are detailed in the paper. **Results:** Our results show that between 2024 and 2050, G-20 countries might surpass 1.2 million lives saved, 115,000 before the end of the decade. We provide device- and country-specific estimates Remarkably, the adoption and the implementation of pedestrian protection safety technologies could save the most total lives in G-20 countries. China, India, and South Korea benefit the most from the full implementation of these technologies. Currently, 31 countries have implemented pedestrian safety technologies. Seat-belts and side-impact protection follow as the most live-saving VSS in G-20 countries. **Conclusions and policy implications for practice:** This work identifies G-20 device- and country-specific estimates of potential lives saved attributable to vehicle standards. Our results are the first ones to our knowledge predicting the effectiveness of these strategies for G-20 nations. This work also shows the large differences in terms of lives saved across countries and VSS that save the most lives, mostly depending on the particular epidemiological profile of road mortality in each of them. Remarkably, G-20 countries have large differences in GDP per capita, that partially explain these differences. This study shows the potential impact of implementing VSS as countries approach the midst of the decade of road safety in which they expect to reduce mortality by 50% in 2030 (Sustainable Development Goal 3.6). The findings of this study will inform stakeholders about the importance of the universal adoption of minimum VSS to ensure the accessibility of vehicle safety globally.

Ind-625 Estimating the Health-Related Quality of Life Burden of Illicit Drug Use Among Australian Adults

PRESENTER: **Rezwanul Rana**
AUTHORS: Addisu Shunu Beyene, Syed Afroz Keramat, Rabeya Basri

Background: Illicit drug use presents a significant public health challenge globally, impacting quality of life and contributing to disease burden. In 2021, around 296 million people aged 15-64 reported drug use, with drug-related health issues leading to a loss of over 36 million years of healthy life measured by Disability-Adjusted Life Years (DALYs).

Objective: This study addresses a critical research gap by examining the association between illicit drugs and health-related quality of life (HRQoL) among Australian adults.

Methods: We utilised longitudinal data from the two most recent waves (wave 17 [2017] and wave 21 [2021] of the Household, Income and Labour Dynamics in Australia (HILDA) survey. We analysed a pooled dataset of 29,811 observations from 18,295 unique individuals. We measured health-related quality of life (HRQoL) through the physical component summary (PCS), the mental component summary (MCS), and the short-form six-dimension utility index (SF-6D). Using random-effects generalised least squares (GLS) estimation, we assessed the association between illicit drug use and HRQOL, focusing on the Physical Component Summary (PCS) and Mental Component Summary (MCS) scores of the SF-36 health survey and the SF-6D utility index. Statistical adjustments were made for various factors, including marital status, education level, income, employment status, Indigenous status, residence, lifestyle factors (e.g., smoking, alcohol use, physical activity), and health conditions. Additionally, we used fixed-effects panel regression models to check the within-person variation in the relationship between illicit drug use and HRQoL. We further analysed the relationships by age and gender, enhancing our understanding of the relationships across demographic subgroups.

Results: Our GLS estimation results indicated that individuals who reported illicit drug use had significantly lower MCS scores (β: -2.27, 95% CI: -2.67; -1.88) compared to non-users, indicating poorer mental health-related quality of life. Illicit drug use was also associated with a reduction in SF-6D utility values (β: -0.02, 95% CI: -0.03; -0.02), further highlighting the negative impact on overall health utility among adults. Illicit drug use significantly reduced MCS and overall HRQOL (SF-6D) scores across genders and age groups, with notable impacts on young adults (aged 15-24, MCS β: -2.24, 95% CI:-2.84; -1.62 and SF-6D β: -0.02; 95% CI: -0.03, -0.01) and male drug uses (MCS β: -2.45, 95% CI:-2.92; -1.98 and SF-6D β: -0.02; 95% CI: -0.03, -0.02).

Conclusion and Policy Implications: Our study underscores the need for comprehensive public health strategies targeting the HRQOL of illicit drug users. Policymakers should prioritise interventions that integrate mental health support with drug harm reduction programs, aiming to improve the quality of life for those affected by illicit drug use. This study adds to the limited body of literature examining the longitudinal impact of illicit drug use on HRQOL and highlights the need for targeted public health interventions that consider both mental and physical dimensions of well-being. Additionally, the SF-6D utility values provided by this study offer a basis for future economic evaluations, supporting the development of cost-effective policies to improve the well-being of illicit drug users across age and gender groups.

abs-os695 Impact of Smoking on Relative Poverty in China: A Two-wave follow-up of the China Family Panel.

PRESENTER: **Qiaoying Wei**
AUTHORS: Peipei Chai, quan wan, Hao Yang, Hewei Xiao, Liuyan Lan

Background: Smoking is harmful to health and imposes a significant economic burden on individuals and their families. Given that China is the largest consumer of tobacco in the world, smoking remains highly prevalent in the country. This study aims to examine the impact of tobacco use on the poverty status of different household types from a relative poverty perspective in China. It provides targeted insights for tobacco control and offers practical references for the development of poverty reduction policies.
Methods: The study utilized the Foster-Greer-Thorbecke Index to estimate the poverty headcount ratio, poverty gap index, and squared poverty gap index across different household types and poverty thresholds, with different poverty threshold, using data from the China Family Panel Studies (CFPS) in 2018 and 2020. It also employed a panel Logit random-effects model to identify factors associated with relative poverty and a panel regression model to assess the impact of smoking on household healthcare expenditures.
Results: When the poverty threshold was defined as half of the median household income, the relative poverty headcount ratio for Chinese households was 22.15% in 2018 and 22.54% in 2020. The poverty gap index decreased from 11.08% to 10.82%, while the squared poverty gap

index increased slightly from 7.13% to 7.17%. The relative poverty headcount ratios were 26.3% in 2018 and 26.24% in 2020 for former smoker households, 24.94% and 23.28% for current smoker households, and 22.75% and 22.37% for non-smoker households.
The Logit regression model showed that the risk of relative poverty was significantly higher for current smoker households (OR=1.643, P<0.01) and former smoker households (OR=1.991, P<0.01) compared to non-smoker households. Households with members aged 65 or older (OR=3.566, P<0.01), with members who had chronic conditions (OR=1.451, P<0.01), or with members who were sick in the past two weeks (OR=1.388, P<0.01) faced a higher risk of falling into relative poverty.
Panel regression results indicated that smoking significantly reduced household healthcare expenditures (P<0.01), with current smoker households spending 18.8% less than non-smoker households. Families with members aged 65 or older (β=0.139, P=0.012), members hospitalized within the last year (β=0.624, P<0.01), or members who were sick in the past two weeks (β=0.087, P=0.010) incurred significantly higher healthcare costs.
Conclusion: The study finds that smoking significantly contributes to the risk of relative poverty in China. It recommends increasing tobacco consumption taxes to reduce affordability, prioritizing smoking cessation interventions for rural smokers, enacting nationwide smoke-free legislation, and using tobacco tax revenue to fund cessation treatments and related interventions.

1:30 PM –3:00 PM TUESDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Jasmine

Quality of Care: Measurement and Impacts

MODERATOR: **Mihir Gandhi**,

Ind-1237 Impact of Surgical Experience on the Quality of Care: Learning-by-Doing in Cardiac Surgery

PRESENTER: **Benedikt Leonardo Langenbeck**
AUTHORS: Esra Eren Bayindir, Jonas Schreyögg

Objectives: In the context of cardiac surgery, surgical experience and specializations is a key factor for the safety and effectiveness of surgical interventions. Learning-by-doing effects are a crucial aspect for a possible reduction in mortality and perioperative complications. Previous research on the impact of surgical experience shows, that doing more surgeries in the past, have a positive effect on the quality of care. However, studies on the exact mechanisms which underly the learning effect are still scarce. Surgeons may gain experience through different learning mechanisms such as specific learning, years of experience and analogy-based learning. By analyzing a comprehensive clinical dataset, this study aims to investigate the different learning mechanisms in the context of coronary artery bypass graft (CABG), mitral valve replacement (MVR), and aortic valve replacement (AVR). This study contributes to the literature through the implementation of sophisticated risk adjustment, the observation of a large time period, and the consideration of different learning mechanisms. Method: This research project uses secondary data from a large heart surgery center in Germany covering more than 20,000 surgeries from 2010 to 2023. The dataset includes the number of heart surgeries performed by 46 surgeons, along with detailed characteristics of both surgeons and patients. We use both linear probability and logistic regression models to analyze how different learning mechanisms affect patient outcomes. The primary outcomes of interest include 30-day, 60-day, and 90-day mortality, the incidence of reoperations and complications, as well as in-hospital deaths. Results: We observe learning-by-doing effects predominantly for more complex surgeries. For AVR, we find that the number of surgeries performed in the last quarter matters most. Performing four additional AVR surgeries in the last quarter, which is the difference between the median and the first quartile, results in a significant 11% (p=0.04) reduction in 30-day mortality. When looking at the first half of the surgeon's career, the effect translates into a 25% (p=0.02) reduction in 30-day mortality. Therefore, specific learning tends to be the most important learning mechanism in cardiac surgery. For CABG and MVR, we find no evidence of learning by doing effects. Conclusion: To strengthen the results, we will work on implementing instrumental variables to move the results in a causal direction. The working days of the surgeons will be used as an instrument. If a surgeon who specializes in a certain type of surgery is absent (vacation, parental leave), other surgeons would be more likely to perform that type of surgery. Absent days of a surgeon presumably affects the surgical outcomes of others surgeons only through its effect on surgeons´ recent experience. Overall, the study highlights the importance of ongoing practice and skill development in improving surgical quality. It also suggests that by thoughtfully assigning surgeries, less experienced surgeons may gain valuable experience with complex procedures. This approach could enhance learning opportunities and improve the overall quality of care.

Ind-471 Development of the Quality of Care for Patients with Advanced Illnesses (QCPAI) Scale for Measuring the Quality of End-Of-Life Care

PRESENTER: **Mihir Gandhi**
AUTHORS: Irene Eng Ai Teo, See Mieng Tan, Yin Bun Cheung, Ravindran Kanesvaran, Shirlyn Hui Shan Neo, Jolene Wong, Eric Finkelstein, Felicia Jia Ler Ang, Alethea Yee

Background: Measuring the quality of end-of-life (EoL) care from the patient's perspective is crucial for improving healthcare delivery, yet no single comprehensive scale is available to assess key aspects of EOL care quality from the patient's perspective.

Aim: To develop and evaluate the measurement properties of the "Quality of Care for Patients with Advanced Illnesses (QCPAI)" scale and its caregiver-proxy version, designed to comprehensively assess EoL care quality from the patient's perspective.

Methods: The scale development process included five steps: (1) conducting a scoping review to identify key EOL care dimensions, (2) item development, (3) forward and backward translation from English into Mandarin Chinese, (4) cognitive debriefing with advanced cancer patients and their caregivers, and (5) item revision. The final version consisted of 15 items, representing key quality indicators. A longitudinal survey, with a baseline and follow-up assessment at 1-week, was conducted on 200 patients with advanced cancer and their caregivers to evaluate the

measurement properties of the scale, including internal consistency, criterion validity, know-group validity, test-retest reliability, and equivalence of self- and proxy-administered responses as well as two language versions. The QCPAI score was weighted based on the importance of items determined using best-worst scaling.

Results: The scoping review identified 9 key dimensions of EOL care: safety, appropriateness of care, coordination and continuity of care, health-related quality of life, dignity, empowerment, interpersonal interactions, effective communication, and access to care. After an expert review, 17 initial items were developed. These items were further revised based on feedback from cognitive debriefing sessions with 15 advanced patients and 10 family caregivers. The final version of the scale consisted of 15 items after removing four items due to overlapping concepts and adding two new items.

The patient cohort (n = 200) for assessing the measurement properties of the scale had a mean age of 62.0 years (SD 11.4), with the majority being Chinese (75.1%), followed by Malay (10.5%), Indian (9.5%), and other ethnicities (4.5%). The most common cancer types were gastrointestinal (35.0%) and lung (15.5%). Caregivers (n = 46) of these patients were typically family members directly involved in caregiving. The QCPAI demonstrated strong internal consistency (Cronbach's alpha >0.9). Test-retest reliability was confirmed with intraclass correlation coefficients between baseline and follow-up scores exceeding 0.75. Criterion validity was supported by a strong Spearman correlation ($\rho > 0.5$) between the QCPAI score and overall quality of care ratings. Known-group validity based on patients with varying quality of life demonstrated significantly different mean QCPAI scores. The scale also showed equivalence between English and Chinese versions, and between self- and caregiver-proxy responses (standardized effect sizes ≤ 0.2).

Conclusions and implications for policy and practice: The 15-item QCPAI scale is a comprehensive and reliable tool for assessing the quality of EOL care from the patient's perspective. It demonstrated acceptable measurement properties in multi-ethnic Asian patients with advanced cancer. QCPAI has the potential to be used in routine clinical practice and for quality improvement initiatives to measure and compare the quality of care delivery across healthcare settings and over time.

Ind-1818 Quality of Services Provided by Online Pharmacies in Kenya and India Findings From a Field Experiment Using Standardized Patients

PRESENTER: **Catherine Goodman**, London School of Hygiene & Tropical Medicine (LSHTM)
AUTHORS: Gautam Satheesh, Sammy Masibo, Benjamin Palafox, Irene Khayoni, Sasi Tiruttani, Francis Wafula, Abdul Salam

Background

The growth of online pharmacy in low- and middle-income countries (LMICs) presents a significant opportunity to enhance access to medicines, but concerns about inappropriate care are frequently raised. We investigated the quality of pharmaceutical care provided by e-pharmacies in Kenya and India, two countries at contrasting stages of e-pharmacy market and regulatory development. We conducted a field experiment using standardised patients (SPs), which have been widely used in health facilities and brick-and-mortar pharmacies, but rarely in LMIC e-pharmacy studies.

Methods

We identified the universe of e-pharmacies selling prescription-only medicines online using typical consumer search strings in Google, identifying 61 in India, and 28 in Kenya. SPs visits were conducted at all e-pharmacies in Jun-Nov 2024 attempting to purchase six different prescription-only medications selected to raise a range of quality of care concerns (antibiotic, antihypertensive, insulin, non-steroidal anti-inflammatory, medical abortion and opioid). We varied the SP encounter to be either (i) with a valid prescription, (ii) without a prescription, or (iii) with a prescription with an error (contraindication, overdose, bulk order). Detailed protocols were developed to ensure that SP cases were presented consistently across e-pharmacies, that risk of detection was minimized, and that the identities of research staff were protected. We classified pharmacy care as 'correct' if SP visits were handled in line with recommended care and, where applicable, government regulations: for 'valid prescription' scenarios, if the medicine delivered matched the prescription; for 'without prescription' and 'prescription with error' scenarios, if medicines were not dispensed; and for opioid cases, if the target product was not available for purchase since online opioid sale is proscribed.

Results

We attempted 1,038 SP visits, of which 499 were terminated as the target product was not stocked, leading to 539 visits completed. Of the purchases attempted without a prescription, the medicine was obtained in 38% of visits in India and 74% in Kenya. For SP visits attempted with a prescription with an error, the medicine was obtained in 59% of visits in India and 76% in Kenya. Although sale of opioids online is not permitted in either country, the target opioid was listed as available for sale in 16% of visits in India and 25% in Kenya, with SPs obtaining the opioid in 3% of visits in India and 7% in Kenya. We obtained 227 medicines, of which a high proportion had no dosing instructions (98% in India, 60% in Kenya), and did not include a product information leaflet (95% in India, 25% in Kenya). The medicines received did not match the exact product/brand/quantity ordered in just 2% of cases in India, but in 17% in Kenya. Fixed-effect logistic regression models will be presented to explore potential determinants of quality pharmacy care, including e-pharmacy website traffic, country of website server, medicine sought, and compliance with website regulations.

Discussion

The findings indicate major concerns about the quality of online pharmacy care highlighting the importance of greater enforcement of risk-based regulations on e-pharmacy practice in LMICs, and the potential for use of SPs in regulatory surveillance.

abs-os577 The Effects of Nurse Anesthesia Supervision on Surgical Quality and Access

PRESENTER: **Kevin Griffith**, Vanderbilt University
AUTHORS: Hillary Mull, Jeffrey Darna, Julia Harris

The United States is experiencing a nationwide shortage of anesthesia providers which limits patients' access to care. Scope of practice limitations for certified registered nurse anesthetists (CRNAs) may exacerbate this shortage. Twenty-six states require CRNAs to be supervised by physician anesthesiologists, and the Centers for Medicare & Medicaid Services requires hospitals to implement CRNA supervision as a condition for reimbursement. Within the U.S. Veterans Health Administration (VHA), CRNAs are often required to be supervised for invasive procedures. Further, the maximum number of CRNAs that can be supervised by a single anesthesiologist varies between states and health systems. However, there is limited evidence on the effects of CRNA scope of practice restrictions on access and quality of care. Using rich administrative data from the VHA, we assessed the effects of CRNA supervision on Veterans' access to surgery and postoperative outcomes.

We identified all invasive surgeries performed at VHA facilities during January 2016 through May 2023 (N=2,629,262). We developed three key predictors:

1) Two indicators for whether the anesthesia was performed by a CRNA under supervision or practicing independently 1) The number of concurrent cases that the supervising anesthesiologist was responsible for during each surgical case (supervision ratio)

Our outcomes included fourteen postoperative outcomes for respiratory (e.g., pneumonia, reintubation), central nervous system (e.g., nerve injury, stroke), urinary tract (e.g., renal failure, infection), and in general (e.g., post anesthesia care unit (PACU) time, readmissions). We estimated logistic regression models adjusted for patient race, ethnicity, sex, age, marital status, comorbidities, surgical complexity, anesthesia complexity, and procedure code. Models also included fixed effects for facility, year, month, specialty, and surgeon. Our unit of analysis was the individual surgery with standard errors clustered by facility and specialty. In sensitivity analyses, we estimated instrumental variable models using the daily facility-level ratio or CRNAs to physician anesthesiologists on duty.

There were few differences in outcomes when anesthesia was performed by CRNAs compared to anesthesiologists. Compared to independent physician practice, supervised CRNA practice was associated with minor increases in PACU times (+8.8 minutes, 95% CI:1.0,16.6). None of the 14 outcomes showed significant differences between independent physician or CRNA practice models.

For supervised surgeries (N=1,639,211), a one-unit increase in the supervision ratio was associated with slightly elevated rates of catheter-associated urinary tract infections (+3.9 per 10,000 surgeries, 95% CI 0.2 to 7.6). There were no significant relationships between supervision ratio and rates for the 13 other postoperative complications.

Our null results are precisely estimated, and our statistically significant findings are small and magnitude and may not be clinically meaningful. Taken together, our results demonstrate the field of anesthesia care is now remarkably safe and CRNAs provide high-quality, cost-effective care to their patients. Anesthesia-related outcomes are highly similar for CRNAs and anesthesiologists, and higher supervision ratios were generally not associated with worse outcomes. The VA and other health systems may consider expanded looser CRNA supervision or expanded scope of practice.

Ind-1721 See You at Night: Emergency Department Response to Financial Incentives in Taiwan

PRESENTER: **Chien-Tzu Cheng**
AUTHOR: Hsien-Ming Lien

Ensuring consistent performance quality within emergency departments (EDs) remains a critical challenge, particularly in the context of constrained resources. ED overcrowding has been widely associated with diminished care quality and unfavorable patient outcomes. This is exacerbated during nighttime hours, where extended wait times are more prevalent, leading to further negative consequences. Various strategies have been proposed to alleviate these challenges, including implementing wait time benchmarks and financial incentive schemes such as pay-for-performance programs. However, their effectiveness depends on hospital and provider responses, sometimes resulting in unintended consequences like gaming or effort substitution. In Taiwan, the National Health Insurance system implemented a subsidy program for 24-hour EDs, increasing diagnostic fee bonuses by 30% for admissions between 10 PM and 6 AM in 2010. Utilizing administrative data from Taiwan's National Health Insurance Research Database, we investigate the behavioral responses of EDs to the subsidy program through an event study design that compares pre- and post-policy periods. We construct a balanced panel of 59 hospitals using 3.9 million ED claims from 2009 to 2010. We ask several research questions. First, we assess whether EDs expanded their care capacity and intensity during nighttime hours. Second, we investigate the possibility of strategic manipulation by hospitals, specifically whether hospitals shifted more patients into nighttime to maximize profits. Third, we examine the substitution effects between emergency and primary care, exploring whether patients opted for ED services to benefit from the enhanced resources without incurring additional costs. Fourth, we evaluate the policy's impact on post-nighttime-ED visit health outcomes, including inpatient admission rates, length of stay, inpatient costs, and mortality rates. Finally, we consider whether hospital responses varied by ownership type. Our findings suggest a pattern consistent with manipulation. Using the number of ED physicians and total treatment expenditure as proxies for care capacity and treatment intensity, we observe no significant policy impact. However, we detect evidence of strategic behavior by hospitals—a 34% increase in the share of the least urgent patients during nighttime, while no similar increase occurred among the most urgent cases. This finding suggests that hospitals may have engaged in profit-maximizing behavior by admitting a greater number of nonurgent patients during the nighttime bonus window. Crucially, our analysis shows no evidence of patients substituting primary care with emergency care due to the policy, implying that the findings are driven by hospitals' behaviors rather than patients' decisions. We further analyze the policy's impact on health outcomes, as shifting admission times for less urgent patients could potentially strain resources for other patients arriving concurrently. However, we observe no impact on hospitalization, the length of stay, or the associated costs of these hospitalizations. Additionally, we detect no measurable impact on mortality. Lastly, we show that hospitals did not respond differently by ownership type across all examined outcomes.

Bali International Convention Centre – Hibiscus

Policies to Address OOP and Catastrophic Health Payments

MODERATOR: **Girmaye Deye Dinsa**,

Ind-148 Catastrophic Health Expenditures: Effectiveness of Nepal's National Health Insurance Program

PRESENTER: **Simrin Kafle**, "Department of Public Health, Aarhus University"
AUTHORS: Shiva Raj Adhikari, Derek Asuman, Per Kallestrup, Dinesh Neupane, Ulrika Enemark

Abstract

Introduction: Catastrophic health expenditure (CHE) is a significant public health concern worldwide, particularly in low- and middle-income countries (LMICs) such as Nepal. This study is the first to evaluate whether the National Health Insurance Program (NHIP) provides protection against catastrophic health spending among households in Nepal.

Methods: We conducted an analytical cross-sectional study in Pokhara Metropolitan City, employing a two-stage random sampling strategy to select 1,276 households from 11 wards. Data were collected through structured interviews between May and October 2023. Propensity Score Matching (PSM) was employed to address selection bias arising from voluntary enrollment, and CHE was defined as out-of-pocket expenditure (OOPE) exceeding 10% of total household consumption. The Average Treatment Effect on the Treated (ATET) was estimated using post-matching diagnostics to ensure balance in covariates, while logistic regression analyzed the association between NHIP enrollment and CHE. Sensitivity analysis, utilizing Rosenbaum bounds, assessed the robustness of results to unobserved confounding.

Results: Of the 1,276 households surveyed, 534 (42%) were enrolled in the NHIP. However, NHIP enrollment was not significantly associated with reduced odds of CHE (Adjusted Odds Ratio [AOR] = 1.174, 95% CI: 0.78–1.74), and the ATET analysis indicated a 3.1 percentage point increase in the likelihood of experiencing CHE among enrolled households. These results suggest limited effectiveness of NHIP in protecting against CHE. Barriers to enrollment and retention, such as long waiting times (64%) and medication shortages (25%), contributed to a 16% dropout rate and reflect significant accessibility and operational inefficiencies. Additionally, the NHIP's benefit package was found to be insufficient, with essential services like transportation, diagnostics, and medicines inadequately covered, leading to persistent OOPE.

Conclusion: The findings underscore the need for NHIP to expand its coverage and introduce flexible coverage limits based on income and households' healthcare needs. The implementation of strategies to mitigate adverse selection and the optimization of resource allocation and administrative processes will be critical to financing these improvements.

Key words: Catastrophic Health Expenditure, Financial Risk Protection, Health Insurance, National Health Insurance Program, Nepal, Out-of-Pocket Expenditure, Propensity Score Matching

Ind-13 Assessing the Determinants of Out-of-pocket Health Expenditure Among Cambodian Households Without Social Health Protection Using Survey Data

PRESENTER: **Sovathiro Mao**, General Secretariat for the National Social Protection Council
AUTHORS: Andrea Hannah Kaiser, Marlaina Ross, Searivoth Vorn, Sokunthea Koy, Jesper Sundewall, Bjoern Ekman, Pichenda Koeut

Background As the deadline for the Sustainable Development Goals approaches, financial protection in Cambodia remains inadequate, especially for nonpoor informal workers lacking formal social health protection coverage or access to other prepayment schemes. This exposes them to high out-of-pocket health expenditures (OOPE) and related financial hardship. To better understand the drivers behind these expenditures, our study aims to model their healthcare, health, and social determinants and to assess their relative importance.

Methods In 2023, we conducted a cross-sectional multistage clustered sampling survey across seven Cambodian provinces, surveying 3,254 households engaged in informal employment and not covered by any formal social health protection scheme. The survey gathered information on households' use of outpatient and inpatient care and associated OOPE. We employed generalized linear models (GLMs) to analyse the healthcare, health, and social determinants of OOPE and the OOPE budget share (the proportion of total annual household consumption expenditure spent on OOPE) and applied Shapley decomposition analysis to quantify the relative contributions of these determinants to the explained variance in our outcomes.

Results Healthcare variables were the dominant contributors to the explained variance in all outcomes (41.36 50.73%), followed by health factors. While several social variables were significant, only the wealth quintile made notable contributions to explaining variance in our outcomes. The key healthcare contributors included the sector type and level of care, and the number of outpatient medications. Important health contributors included illness severity and the presence of chronic illnesses or noncommunicable diseases.

Conclusions Our findings emphasize the necessity of integrating nonpoor informal workers and their dependents into formal prepayment schemes to reduce OOPE and enhance financial protection on Cambodia's path toward universal health coverage. Strategically engaging with private providers and pharmacies to improve access to essential services and medicines, coupled with the implementation of an effective referral system are important

Ind-178 Can Long-Term Care Insurance Reduce Catastrophic Health and Long-Term Care Expenditures Among Older Adults? A Quasi-Experimental Study in China

PRESENTER: **Chengxu Long**, King's College London
AUTHORS: Wei Yang, Karen Glaser

Older adults with cognitive and/or physical limitations often face excessive health and long-term care (LTC) costs, which significantly affect their living standards. However, current measures of catastrophic health expenditure primarily focus on healthcare costs, overlooking the substantial burden of LTC costs. Our study is among the first to introduce the concept of catastrophic health and long-term care expenditures (CHLTCE) to comprehensively capture the economic burden of health and LTC costs associated with functional limitations. Drawing data from 2011, 2013, 2015, and 2018 waves of China Health and Retirement Longitudinal Study, we employed a staggered difference-in-differences approach to assess the impact of long-term care insurance (LTCI) on alleviating CHLTCE. We found that after accounting for LTC costs, both total health and LTC expenditures and CHLTCE risk significantly increased compared to when only healthcare costs were considered. Furthermore, LTCI coverage significantly reduced CHLTCE risks among older adults with cognitive and/or physical limitations. This effect was more pronounced among those with severe cognitive impairments and those with physical limitations and chronic diseases. In addition, its effectiveness in reducing CHLTCE risks for individuals with complex care needs was observed only at the high threshold, but not at lower thresholds. Our findings offer empirical contributions by incorporating both health and LTC costs into catastrophic expenditures analysis. We recommend that policymakers refine LTCI eligibility criteria and implement tiered coverage options based on various levels and dimensions of cognitive and physical function—beyond activities of daily living—to offer targeted protection for individuals with complex care needs.

Ind-987 Services and Cash: How Long-Term Care Insurance Benefit Design Affects Household Behavior in China

PRESENTER: **Mr. Terence Cheng**
AUTHORS: Minghao Wu, Miao Guo, Yang Li

Background: As populations age, the demand for long-term care (LTC) services grows, raising questions on how best to finance and deliver LTC services to meet this need. Due to the high fiscal cost of LTC and to alleviate the burden on families, there is growing recognition of the need for formal systems to finance LTC to complement the provision of informal care. In 2016, China launched a pilot program for long-term care insurance (LTCI) aimed at supporting individuals with long-term disabilities. Pilot cities offer two types of benefits: in-kind services and mixed benefits (in-kind and cash). This study examines how these designs influence household behavior, focusing on consumption patterns, financial support, and informal care.

Methods: We begin by analyzing conceptually household utility maximization decisions under the two types of LTC benefits. Building on the conceptual model, we estimate an empirical model to evaluate the impact of the two types of LTCI benefits on household consumption and intergenerational support. Our data comes from the China Health and Retirement Longitudinal Study, a nationally representative sample of residents ages 45 and older in China. Our research uses four waves of data from surveys that were conducted in 2011, 2013, 2015, and 2018. LTCI eligibility is determined by the program's introduction year in each respondent's city.

Our analysis examines two sets of outcomes: household expenditures (on clothing, food, housing, transportation, miscellaneous, and healthcare) and intergenerational support behaviors (financial transfers and informal care). We exploit the staggered roll-out of LTCI across cities and differences in benefit types to identify causal effects.

Results: Households receiving mixed benefits significantly increased spending on food and housing, while those receiving in-kind benefits increased spending on housing, transport, and clothing. Both groups reduced medical expenditures, suggesting a shift from medical services to LTC services.

In-kind benefits were associated with reduced informal care from children, indicating a substitution of formal care for family-provided care and alleviating caregiver burden. Conversely, mixed benefits led to a significant decline in financial support from children, suggesting cash benefits crowd out intergenerational financial transfers. Overall, mixed benefits promoted higher levels of non-medical consumption, enhancing household welfare.

Conclusion: Our findings highlight the need to tailor LTCI benefit designs to address the diverse needs of older adults and their families. Balancing in-kind and cash benefits can enhance household welfare, alleviate caregiving burdens, and improve the efficiency and sustainability of LTC systems in low- and middle-income countries.

1:30 PM –3:00 PM TUESDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Dahlia

Performance Evaluation of Healthcare Programs

MODERATOR: **Estela Capelas Barbosa**,

Ind-958 Assessing Health Care System Performance for Each US County Using the Triple Aim Framework

PRESENTER: **Azalea Thomson**
AUTHORS: Haley Kathryn Lescinsky, Joseph Dieleman, Maitreyi Sahu, Kayla Taylor, Max Weil, Meera Beauchamp, Drew DeJarnatt, Sawyer Crosby

The Triple Aim of healthcare systems is to provide patients with a good experience, achieve positive health outcomes, and spend relatively few resources. By many accounts, the United States health care system is failing the Triple Aim litmus test with high mortality, low healthcare access, and the highest rates of health spending per person in the world. However, there is much variation within the US. In this study, we (i) examine if any US counties are doing well by the triple aim standards, (ii) describe the populations living in exemplar counties, and (iii) identify health system characteristics and policies associated with positive county performance.

We extracted county-specific estimates of life expectancy from the Global Health Data Exchange and direct health care spending per capita, adjusted for local prices and age structure, from our previous work (under review currently). We used previous literature to identify five subdomains of patient experience: accessibility, prevention, safety, appropriateness, and patient-centeredness. We extracted county-level measures for each of the subdomains from the CMS Hospital Patient Survey (HCAHPS), the Area Health Resource File, and Mapping Medicare disparities tool and made a composite measure of patient experience using principal components analysis. Then, we assessed each county on all three aims jointly to create an exemplar score for each county from 2014 to 2019. Exemplar counties were defined as counties who were in the top quartile for each of the three triple aim indicators, in each year. We assessed if exemplar counties had statistically different population characteristics than non-exemplar counties. Finally, we measured the association between exemplar scores and relevant policy variables at the state and county level with bivariate regressions controlling for key observed exemplar characteristics.

We found that in 2019, 2% of US counties were in the top quantile of all 3 aims. The people who lived in these exemplar counties were more educated, wealthier, more urban, less black, and less obese than those who lived in non-exemplar counties. After adjusting for education, income, race, ruralness, and obesity, we found that places with higher rates of managed care for Medicaid and Medicare and places with lower market concentration of hospitals and insurers were more successful at making progress towards the triple aim. Additionally, we found that these results were robust to alternative definitions of patient experience, using all-cause mortality instead of life-expectancy, and not adjusting health expenditure for state purchasing power.

The triple aim criterion is an ambitious target that few counties in the United States have achieved. Those that have are places with high relative privilege, suggesting that our health care system is performing strongest in the counties with the greatest means. We show that expanding managed care insurance plans and increasing market competition for hospitals and insurers could improve county health system's progress towards the triple aim.

Ind-1046 Sri Lanka Hospital Efficiency Analysis

PRESENTER: **Anuji Gamage**, KDU
AUTHORS: Son Nghiem, Amala de Silva, Hideki Higashi, Deepika Attygalle, Suganya Yogeswaran, Sridharan Sathasivam

Introduction

Sri Lanka's health system is recognized as one of the most efficient among low- and middle-income countries, achieving strong health outcomes at low costs. However, the COVID-19 pandemic challenged the system's ability to maintain non-COVID care while managing the outbreak. An initial assessment by the World Bank revealed inefficiencies, with higher-level hospitals overloaded with cases manageable at primary care facilities. This study aims to estimate hospital efficiency across different levels of care, using these findings to guide policymakers in improving healthcare services.

Methods

The study employed Data Envelopment Analysis (DEA) to estimate the technical efficiency of Sri Lanka hospitals. DEA calculates the distance between observed input-output combinations and an optimal production frontier. The analysis covers three main types of hospitals: district, base, and divisional hospitals. Data on inputs (beds, doctors, and nurses) and outputs (number of discharges and outpatient visits), were collected from a random sample of 81 hospitals. We also construct a meta frontier comprising all hospitals to estimate technological gaps between types of hospitals. Bootstrap methods were used to minimize potential bias due to measurement errors. The effects of environmental factors on efficiency were analyzed using regressions.

Data

Data were collected from the Ministry of Health, encompassing hospital infrastructure, human resources, and service delivery metrics for 2020. The dataset includes 19 district hospitals, 41 base hospitals, and 29 divisional hospitals, with inputs like the number of beds and medical staff and outputs such as inpatient discharges and outpatient visits. Descriptive statistics reveal significant size differences between hospital types, with district hospitals being the largest and divisional hospitals the smallest.

Results

The DEA results indicate that district hospitals are the most efficient, with an average technical efficiency of 91%. Divisional hospitals also performed well, scoring 90%, while base hospitals lagged at 84%. On the meta-frontier, which compares all hospitals regardless of type, district hospitals remained the most efficient, achieving 85%, followed by divisional hospitals at 78% and base hospitals at 73%. Hospitals in the

Western Province were found to be the most efficient, while those in the Northern Province had the largest potential for improvement.

Discussion

The findings suggest district hospitals are more productive in inpatient services, while divisional hospitals excel in outpatient care. Differences in hospital efficiency may stem from variations in input-output structures, such as staffing levels and patient admissions. Technological gaps between hospital types indicate that significant efficiency gains can be made by adopting best practices from more efficient hospitals. Environmental factors, such as the population size of hospital locations, also play a role in determining efficiency, though the impact is modest.

Conclusion

Sri Lanka's hospitals exhibit varying levels of efficiency, with district hospitals leading in technical performance. The study highlights the importance of improving primary care to relieve the burden on higher-level hospitals, potentially increasing overall system efficiency. Future efficiency analyses should incorporate data on the quality of care and service complexity. Periodic assessments are recommended to monitor improvements and guide policy reforms in the healthcare sector.

Ind-724 Evaluation of the Priority Primary Care Centre program in the Western region of Victoria, Australia

PRESENTER: **Feby Savira**, Deakin University
AUTHORS: Sean Randall, Madison Frith, Naomi White, Andrew Giddy, Anna Peeters, Kirsty McLean, Jamie Swann, Suzanne Robinson

Introduction: The Victorian State Government of Australia has established Priority Primary Care Centers (PPCCs) to reduce the demand for Emergency Departments (EDs). PPCCs are general practitioner led, free of charge services that aim to provide care for conditions that require urgent attention, but do not require the high-acuity care of an ED. This study aims to evaluate the implementation and impact of the PPCC on ED demand in three sites within the Western region of Victoria, Australia. **Methods:** This is an observational mixed methods study. A scoping review was conducted to synthesise international literature on the effectiveness of PPCC-like services (i.e., urgent care centres). The quantitative component involved analysis of de-identified administrative data, comprising PPCC clinical records and ED presentation records, as well as patient survey. Qualitative data collection involved semi-structured interviews to understand the experiences of PPCC patients, clinical staff, managerial and administrative staff and ED clinical staff. Implementation science frameworks have been integrated within the study design. **Results:** Scoping review findings suggest while often context-specific, urgent care centres, particularly walk-in clinics and after-hour clinics, are associated with reduced ED visits and high patient satisfaction. Analysis of PPCC clinical records from 28 October 2022 until 8 June 2024 indicated 48,772 unique attendances. Most PPCC attendees in the region were either younger patients (31%) or older adults (20%), predominantly residing in regional centres (51%) and belonging to middle socioeconomic groups (33% in Quintile 3 and 26% in Quintile 4). Majority of attendances were appropriate low acuity presentations and resolved in-clinic (82%). There was no change in ED presentations across all sites, however, there was improvement in proportion of patients receiving treatment within one hour at the ED. Survey data showed that 1,161 of 2,351 respondents (49%) would have attended the ED if the PPCC were unavailable. Qualitative data suggests PPCC offers accessible, affordable, and convenient care. Facilitators to successful implementation of PPCC included experienced workforce, effective planning and resource management, and effective collaboration and leadership, while barriers included poor community awareness and interoperability issues. **Conclusion:** The PPCC has reached a broad range of patients with various demographic and socioeconomic backgrounds across the region.* *There was limited evidence on its impact in reducing ED presentations, however this should be viewed in context of ever-increasing healthcare demand. Most attendances were resolved in the clinic, suggesting the PPCC is filling a gap of unmet need for urgent but low-acuity care.**

Ind-1341 Level and Determinants of District Primary Health Care System Technical Efficiency in Ghana: Two-stage Stochastic Frontier Analysis

PRESENTER: **Beatrice Amboko**

Abstract

Background: Primary healthcare (PHC) is a fundamental component of achieving universal health coverage. In Ghana, PHC services are organized at the district level. This study aimed to estimate the level of technical efficiency and identify its determinants in the district-level PHC system across the country.

Methods: A two-step stochastic frontier analysis model was utilized, drawing on data from 181 districts in Ghana. The output variable was a composite coverage index derived from eight key PHC service indicators for the year 2021, which included the percentage of women aged 15 to 49 who had their family planning needs met using modern methods, the proportion of antenatal care (ANC) clients who completed four visits, and the percentage of deliveries attended by skilled healthcare providers. It also covered measles-rubella vaccine coverage for children aged 18 to 59 months, BCG vaccine coverage for children under one year, the proportion of children who received the DPT3 vaccine, the percentage of tuberculosis (TB) cases that completed treatment, and the share of ANC clients who received long-lasting insecticide-treated nets (LLINs). The input variables considered were district health expenditure for the fiscal year 2020/2021, the number of health facilities, and the count of clinical staff in 2021. The study further examined how technical efficiency scores were associated with various health system, socioeconomic, and demographic factors. These factors included the type of health facility, insurance coverage, literacy levels, Gini coefficient (as a measure of income inequality), poverty incidence, urbanization, and population density.

Results: The analysis revealed that the mean technical efficiency of the district PHC system in Ghana was 87%, with a standard deviation of 6.6%, ranging from 65% to 99%. The two significant predictors of technical efficiency were identified as the proportion of PHC health facilities and the Gini coefficient. A higher proportion of PHC facilities was positively associated with technical efficiency (coefficient = 0.151; 95% CI: 0.041-0.261), while higher income inequality, as indicated by the Gini coefficient, was negatively associated with efficiency (coefficient =

-0.858; 95% CI: -1.146 to -0.252).

Conclusion: The findings suggest that districts in Ghana could potentially improve their PHC outputs by an average of 13% by addressing key determinants of technical efficiency. Enhancing the proportion of PHC facilities within districts is likely to improve efficiency within the health sector. Additionally, reducing income inequality is essential for optimizing the performance of district-level PHC systems, thus contributing to better healthcare delivery and outcomes.

Ind-2358 The Impact of Supplementary Nutrition on Low Birthweight Outcomes in India: Evidence from the Integrated Child Development Services Program

PRESENTER: **Shabnam .**
AUTHOR: Mohammed Faheem Khan

Introduction: Low birthweight (LBW) is defined as a birth weight of less than 2,500 grams at the time of delivery. LBW can have significant consequences, as infants with this condition are more vulnerable to recurrent hospitalizations, neurodevelopmental disorders, chronic health issues, and higher mortality rates in children under five years old. Globally, LBW is linked to 60-80% of neonatal mortality cases, with the prevalence being highest in South Asian countries. The World Health Organization has set a target to reduce the prevalence of LBW by 30% by 2025. In India, the reported LBW prevalence is 18%, making it one of the highest in the world. The country faces substantial challenges in achieving its Sustainable Development Goal (SDG) by 2030. To address this issue, the Government of India introduced the Integrated Child Development Services (ICDS) program, which aims to provide food, preschool education, and primary healthcare to children under the age of six and their mothers.

Research Question: The objective of this study is to assess the impact of the supplementary food distribution program for pregnant women under the Integrated Child Development Services (ICDS) and Anganwadi Centers (AWC) on the incidence of low birth weight (LBW) in newborns in India. Additionally, the study aims to evaluate how this program influences the utilization of maternal and child healthcare services, such as antenatal care, institutional deliveries, and postnatal care, as well as outcomes like neonatal mortality.

Data and Method: This study uses the latest National Family Health Survey (NFHS) data to assess the impact of supplementary nutrition provided to pregnant women under the ICDS program on reducing LBW. The study links the birth weights of children born between 2014 and 2021 with their mother's status of receipt of supplementary nutrition under ICDS. However, the utilization of these ICDS services is self-selective and not entirely random. To enhance the robustness of our results and to minimize endogeneity and omitted variable bias, an econometric quasi-experimental matching approach was employed in estimating the impact of the supplementary nutrition program on the incidence of LBW at the time of birth and neonatal mortality (i.e. death of the newborn withing a month of birth).

Results: The findings indicate that receiving supplementary nutrition significantly reduces the prevalence of LBW by approximately 0.54 percentage points (β: -0.0139; 95% CI: -0.0115 to -0.0116, p: 0.003 and early neonatal mortality by 2 per 1000 live births. The mothers using ICDS services are more likely to utilize essential maternal and child health care services, including antenatal care, institutional deliveries, and postnatal care. These results indicate an urgent need for improved nutritional interventions to combat undernutrition and enhance maternal and child health outcomes in India.

Ind-1231 Effect of Hypertensive Follow-up Services on Health-related Quality of Life: Evidence From National Health Service Survey in Western China

PRESENTER: **Yan Zhuang**
AUTHORS: Chi Shen, Zhongliang Zhou

Objective

Providing health management services for patients with chronic diseases is considered as one of the most cost-effectiveness way to early detection and continuous monitoring of potential health issues and enhancement of health outcomes around the world. Since 2009, China has adopted an Essential Public Health Services Programme including providing follow-up service for hypertension patients. This study aims to provide clear and comprehensive evidence on the impact of follow-up services on and health-related quality of life (HRQoL) for patients with hypertension, contributing to improvement of health management follow-up services programme and enhancement of the overall health utility.

Methods

A total of 9,327 hypertensive patients were used in this study. The data was collected from a province in Western China as part of the 2023 National Health Services Survey (NHSS) in China. According to the "National Essential Public Health Service Standards" issued by China in 2009, patients with primary hypertension should receive at least four face-to-face follow-up visits annually. Based on this guideline, we categorized the independent variable into three groups: no follow-up; follow-up times below the standard; and follow-up times meeting the standard. For health utility outcomes, we focused on HRQoL as measured by the EQ-5D-5L scale. We applied the Utility Index(UI) score calculated from the Chinese Health Utility Score System of the EQ-5D-5L scale to proxy for HRQoL, and the UI score ranged from -0.391 to 1.000. Tobit regression, logistic regression and linear regression were employed. We further explored the impact of contents and pattern of follow-up services on HRQoL. Additionally, we investigated potential mechanisms.

Results

UFS significantly enhance the health utility of hypertensive patients. Compared to patients without follow-up utilization, those who were followed-up more than 4 time in a year experienced an increase of 0.041 units in their UI score, while patients who do not meet the criteria saw

an increase of 0.029 units. Furthermore, we found that the pattern of visiting medical institutions for follow-up is more effective than the pattern of home visits for follow-up. Among contents of the follow-up services, "blood pressure measurement" and "medication review" significantly improved UI score of hypertensive patients. Mechanism testing indicates that UFS program improved health outcomes by enhancing medication adherence and blood pressure monitoring compliance, and effectively controlling blood pressure. The results of robustness analysis are consistent.

Conclusions

This study reveals a positive association between follow-up services and the enhancement of health-related quality of life among hypertensive patients in Western China. It is crucial for the government to continue improving essential public health services, particularly follow-up services for chronic disease populations and exploring optimal delivery patterns of follow-up services. These evidences offer valuable insights for implementing essential public health programs in low- and middle-income countries.

Ind-185 The Impact of the Long-Term Care Cognitive Assistance Grade on Healthcare Utilization and Health Outcomes Among Older Adults

PRESENTER: **Hajae Jeon**
AUTHOR: Jaeyong Shin
Abstract

Background: With the rapid global aging trend, managing cognitive function and addressing the economic burden of dementia care have become critical challenges. South Korea implemented the Cognitive Assistance Grade within its Long-Term Care Insurance program in January 2018 to slow cognitive decline and improve healthcare outcomes for older adults. This study evaluates the policy's effectiveness by analyzing its impact on cognitive and physical function, healthcare utilization (outpatient visits, hospitalizations), and medical expenditures among dementia patients.

Methods: We used the National Health Information Database from National Health Insurance Service. The study included 3,766,422 individuals. Using a quasi-experimental design, this study analyzed national data spanning from 2014 to June 2024. Propensity score matching (PSM) and difference-in-differences (DID) analyses were employed to compare the outcomes of Cognitive Assistance Grade beneficiaries and non-beneficiaries.

Results: The Cognitive Assistance Grade significantly delayed cognitive decline among beneficiaries compared to non-beneficiaries (RR = 0.8552, $p < 0.0001$). However, no statistically significant difference was observed in physical function (RR = 1.0362, $p = 0.2313$). The policy also led to a reduction in outpatient visits (RR = 0.9420, $p < 0.0001$). In contrast, the policy resulted in a significant increase in inpatient length of stay (RR = 1.1990, $p < 0.0001$).

Conclusions: The Cognitive Assistance Grade policy effectively slows cognitive decline in dementia patients, emphasizing its importance in preventive dementia care. However, the lack of significant impact on physical function highlights the need for tailored interventions addressing physical activity and rehabilitation. The contrasting patterns of outpatient and inpatient service utilization suggest differing healthcare needs, underscoring the necessity of comprehensive support programs to balance healthcare service use and improve outcomes for vulnerable older adults. These findings provided valuable evidence for expanding the CAG policy to ensure broader and more equitable access to dementia care programs and support tailored interventions to improve the outcomes for at-risk older adults.

Keywords: Dementia Policy Evaluation, Cognitive Decline Prevention, Healthcare Utilization, Aging Population Health

Ind-875 Mental Health Outcome and Costs associated with Intensive Community Mental Health Recovery Service Receipt among Veterans in the United States

PRESENTER: **Suja S Rajan**, University of Texas - Health Science Center at Houston
AUTHORS: Michelle Winkler, Alexander Duman

Background: In the U.S., mental illness prevalence is substantially more among veterans as compared with the general population. More than 5.2 million veterans, who form 30% of the total veteran population, experience mental illness. The federal government has recently budgeted about USD14 billion for veterans' mental health care. Given the higher mental illness prevalence among the veterans, the Veterans Health Administration (VHA) has established numerous state-of-the-art services to provide veterans with evidence-based, high-quality mental health care. The Intensive Community Mental Health Recovery (ICMHR) services are one such group of services aimed at serving veterans with serious mental illness (SMI; defined as psychoses and/or bipolar disorders) and/or severe functional impairment. ICMHR services provide clinical community-based case management to improve psychiatric symptoms, prevent mental health crisis requiring hospitalizations or emergency department visits, and enhance satisfaction and quality of life among veterans. **Study Aims:** This study, for the first time, aims to examine the association between ICMHR service receipt and 1) Mental health outcome measured using the 19-item Brief Psychiatric Rating Scale (BPRS) score; and 2) VHA inpatient and outpatient mental health care costs during the year before and after ICMHR service initiation. BPRS is the oldest and currently the most widely used score for evaluating the effectiveness of mental health interventions and treatments. These aims will help understand if ICMHR initiation is associated with psychiatric symptom improvement and reduction in mental health care costs at the VHA. The study was conducted as part of an objective external evaluation of VHA's mental health programs through an inter-institutional collaboration. **Methods:** This retrospective observational study includes veterans who enrolled in ICMHR services during October 2018-September 2021, and had a BPRS score at the time of enrollment (baseline), and at 6th and/or 12th month post-enrollment. VHA inpatient and outpatient mental health care costs were also estimated from the VHA data. Mixed effects linear regressions for panel data were used to examine the change in BPRS scores over time during the first year after ICMHR initiation, and the change in mental health care costs before

and after ICMHR initiation. **Results:** The study found a statistically significant decrease in BPRS scores during the 6th (Marginal Effect: -1.6; 95%CI: -2.2 to -1.0) and 12th month (Marginal Effect: -2.4; 95%CI: -3.0 to -1.7) follow-up, after ICMHR initiation, as compared with the baseline score, after adjusting for veteran socio-demographic and clinical characteristics. The study also found an adjusted reduction in cost of -1,248.19USD (95%CI: -2,011 to -485) and -6,574.60USD (95%CI: -7,337 to -5,812) during the first six-months and 7 to 12 months after ICMHR initiation, respectively, compared with the six months before ICMHR initiation. **Conclusion:** These results suggest that the ICMHR services are potentially effective in improving psychiatric symptoms, as measured by the BPRS scores, in veterans enrolled in these services, and reduce mental health care costs at the VHA, thereby successfully upholding VHA's directive to help veterans with SMI.

1:30 PM –3:00 PM TUESDAY [Health Beyond The Health System]

Bali International Convention Centre – Karangasem

Impact and Response to Climate Change

MODERATOR: **Nicholas Stacey**,

Ind-1175 Examining the Relationship Between Climate-Induced Household Food Security and Childhood Nutritional Status in Burkina Faso Using Longitudinal Data

PRESENTER: **Edmund Yeboah**, Heidelberg Institute of Global Health, Heidelberg University
AUTHORS: Windpanga Aristide Ouédraogo, Ina Danquah, Valerie Louis, Ms. Manuela De Allegri, Ali Sie, Rainer Sauerborn

Background: The link between climate change and food security is well-established, with evidence indicating that climate change affects child nutrition mainly by exacerbating household food insecurity, especially in resource-limited, climate-sensitive agricultural settings. However, most studies are cross-sectional or rely on theoretical models, limiting causal inference. This gap highlights the need for longitudinal research to rigorously assess the causal impact of climate-induced food insecurity on undernutrition in at-risk populations. Building on a prior cross-sectional study, which found a strong association between climate variability and household food security in the study area, we use a longitudinal approach to examine the causal link between household food insecurity and child undernutrition. **Methodology**: We used three rounds of annual data from 2020 to 2022 from a dynamic cohort of 2,000 children under five and their households within the Nouna Health and Demographic Surveillance System in rural Burkina Faso. A fixed-effect (FE) model was used to explore the causal relationship between food security and childhood undernutrition (stunting and wasting). Stunting was measured by height/length-for-age z-scores, while wasting was assessed using weight-for-age z-scores. Household food security was evaluated through the Household Food Insecurity Access Scale, which captures household food access based on lived experiences. **Results**: Overall, 21% of children were stunted, while 15% were wasted. We found a decline in food security over time. In 2020, about 76% of households were food secure, but this rate dropped to 56% in 2022. Correspondingly, the proportion of households experiencing mild, moderate, and severe food insecurity increased, particularly in the "Moderately Food Insecure" category, which rose from 6% in 2020 to 25% in 2022. Household food security status was associated with stunting and wasting: children in severely food-insecure households had the highest stunting (29.4%) and wasting (21%) rates, while food-secure households had lower rates. Our FE model estimates indicated that mildly and moderately food-insecure households had significantly better height-for-age z-scores than severely food-insecure ones, indicating reduced stunting risk. However, weight-for-age z-scores did not significantly vary by food security status, suggesting no strong association with wasting. **Conclusion**: Our findings show that food insecurity is worsening, with increasing numbers of households facing moderate to severe food access issues, reflecting rising economic or environmental pressures affecting food availability. Policy interventions must address these underlying causes and support vulnerable households in securing adequate, nutritious food to help prevent stunting and improve child health outcomes.

Ind-736 Tiny Lungs, Big Costs: The Economic Burden of Air Pollution on Child Health in South Korea

PRESENTER: **Haedong Kim**
AUTHORS: Jaeyong Shin, Hee-Seung Yang, Junghwan Suh

Background:
Air pollution remains a major public health concern worldwide, with PM2.5 (particulate matter ≤ 2.5μm) recognized as one of the most harmful pollutants due to its ability to infiltrate the lungs and enter the bloodstream. While its general health impacts are well-documented, limited research has specifically examined how PM2.5 affects young children, particularly in terms of respiratory healthcare use and related expenditures. This study addresses this gap by analyzing the clinical and economic burden of PM2.5 on children's health in South Korea, a country with consistently high PM2.5 levels among OECD nations.

Objective:
The study aims to quantify the causal impact of ambient PM2.5 exposure on respiratory healthcare expenditures and medical visit frequency among children aged 0–95 months. Special focus is given to identifying age-specific vulnerability and evaluating the financial implications for the National Health Insurance Service (NHIS).

Methodology:
Using complete administrative panel data from NHIS (2015–2021), the study includes over 4.17 million children who participated in the National Health Screening Program for Infants and Children. The data captures monthly healthcare expenditures and visit frequencies. Ambient PM2.5 concentrations are merged using grid-level air quality data from Korea's National Institute of Environmental Research. To address potential endogeneity in pollution exposure, thermal inversion—a meteorological phenomenon that traps pollutants near the surface—is used as an instrumental variable. The empirical strategy employs a two-stage least squares (2SLS) fixed-effects model, controlling for individual, socioeconomic, and seasonal factors.

Key Findings:
PM2.5 exposure significantly increases respiratory-related healthcare utilization, with the effects most pronounced in early childhood. A 1 μg/m³ increase in monthly PM2.5 leads to a 0.067 rise in log monthly respiratory healthcare expenditure for children aged 0–11 months, with the magnitude declining steadily with age and becoming statistically insignificant beyond age five. When expressed in economic terms, a 0.5 standard deviation increase in PM2.5 (approximately 3.72 μg/m³) is associated with a 23.2% rise in respiratory healthcare spending for children aged 0–4. Given that this group incurred KRW 867.4 billion (approx. USD 667 million) in respiratory spending in 2019, this translates into an estimated additional annual burden of KRW 201.1 billion (approx. USD 154.7 million). Furthermore, the study finds that while healthcare visit frequency (quantity) remains elevated into later childhood, the corresponding expenditure (severity) declines more rapidly, indicating that older children may seek care with less serious symptoms, whereas infants and toddlers bear the brunt of the clinical and financial burden.

Policy Implications:
The findings highlight the urgent need for targeted air quality interventions, particularly for early childhood. Reducing PM2.5 levels can yield a dual benefit—improving health outcomes and lowering public healthcare costs. Given the disproportionately high burden on younger children, policies should prioritize emission control, air filtration in childcare facilities, and seasonal alerts during high pollution periods.

Ind-608 Effect of Financial Credit and Climate-Smart Agricultural Training on Livelihoods and Nutrition of People Living With HIV: A Cluster-Randomized Trial

PRESENTER: **Helen Harris-Fry**
AUTHORS: Edward Frongillo, Sheri Weiser, A. Rain Mocello, Craig Cohen, Suneetha Kadiyala, Tammy Nicastro, Elizabeth Bukusi, Elly Weke

Background: Despite global commitments to eliminate HIV by 2030, it is estimated that 9.2 million people living with HIV did not access antiretroviral treatment (ART) in 2022. Food insecurity is a major barrier to ART access and adherence, both because people cannot afford to buy food and cover the costs of accessing ART, and because of the adverse side effects of taking ART on an empty stomach. Recognising this, UN agencies recommend that livelihoods-based solutions should be integrated into HIV strategies, although there is limited evidence on effective models for doing so.

Methods: This is a secondary analysis of a parallel cluster-randomized controlled trial, which evaluates the effects of a climate-smart livelihoods intervention, Shamba Maisha, on agricultural production and diet quality of farmers living with HIV in Western Kenya. The intervention provided credit (175 USD) for an irrigation pump and other agricultural inputs, and a series of training sessions on climate-smart agriculture and financial management. Participants in control clinics received standard government services. Clusters were clinics in three sub-counties of Western Kenya that were providing HIV services to >350 patients. Participants were adults aged 18-60 years in a patient support group, receiving antiretroviral therapy for ≥6 months, with access to land and water source, and moderate to severe food insecurity and/or BMI <18.5 kg/m^2. Our main outcomes were dietary diversity (food groups/day) and crop diversity (unique crops/year), which we constructed using assessments at 0, 6, 12, 18, and 24 months. Secondary outcomes were underweight (mid-upper arm circumference <24.5cm), value of agricultural production (1000 KSH/year), and farmland use (hectares). Pre-planned sub-group analyses disaggregated impacts on main outcomes by season and gender. Analyses were by intention-to-treat, and used difference-in-difference linear and logistic regression models.

Results: 16 clinics were randomly allocated to intervention or control (1:1 ratio), from which 720 participants were enrolled (intervention 366; control 354) and 677 participants were evaluated (intervention 344; control 333). Relative to control, the intervention increased crop diversity (mean difference-in-difference: 1.9 crops [95% CI 1.5, 2.3]). Impacts were similar by season and gender of participant. Value of production also increased (3891 KSH [49, 7734]), while land use declined (-0.88 hectares [-1.30, -0.42]), suggesting some increases in farming efficiency. Impacts on agriculture did not translate into improvements in nutrition outcomes within the study time frame. There was no effects on diet diversity (-0.17 food groups [-0.4, 0.03]), regardless of season or gender. There was also no effect on prevalence of underweight (OR 0.8 [95% CI, 0.39, 1.5]), which was already a rare outcome at baseline.

Conclusion: Well-designed climate-smart agriculture could be an important means to improve the agricultural productivity and livelihoods of farmers living with HIV, across flood- and drought-prone seasons, and with equitable impacts for men and women. These approaches would benefit from additional nutrition-sensitive components designed to translate such benefits into improvements in nutritional outcomes.

Ind-1305 Energy Prices and Health Impacts: Light on Renewable Energy Diffusion

PRESENTER: **Yi-Chun Ko**
AUTHOR: Shinsuke Uchida

Adverse health outcomes have increased with the rise in extreme temperatures caused by climate change. According to the 2023 WHO fact sheets, health costs from temperature-related impacts are projected to reach US$2-4 billion annually by 2030. These impacts include acute conditions like hypothermia and hyperthermia, as well as chronic illnesses such as respiratory and cardiovascular diseases. Existing literature highlights a U-shaped relationship between temperatures and health risks–e.g., both extreme cold and heat increase mortality rates (Heal and Park 2016 *REEP*).

Home climate control devices, such as air conditioning, serve as a form of household self-protection against extreme temperatures (Barreca et al. 2016. *JPE*). However, their reliance on energy makes them vulnerable to rising energy costs. With global energy prices escalating due to recent inflation and geopolitical instability, insufficient indoor temperature control can worsen health outcomes. Recent studies confirm that higher energy prices are linked to increased mortality rates (Neidell et al. 2021 *J. Health Econ.*; Chirakijja et al. 2024 *Econ. J.*).

This research investigates self-sufficient renewable energy technologies as a potential solution to mitigate the health risks under the pressure of

high energy prices. Specifically, we explore the extent to which residential solar photovoltaics (PVs) can reduce the health risks. Solar PVs convert solar energy into power for household use as electricity or heat, lowering energy expenses and enabling more flexible energy use. By shifting the focus from renewable energy's environmental benefits, such as CO2 reduction, to the energy-health nexus, this study emphasizes the public health implications of sustainable energy adoption.

Using Japan's prefecture-month-level mortality data from 2009 to 2014, we evaluate our hypotheses within the context of the 2011 Great East Japan Earthquake, which triggered a sharp increase of electricity prices due to a shift away from nuclear power. Mortality and household characteristic data are sourced from He and Tanaka (2023 *AEJ: Applied Economics*), while weather data (temperature, precipitation, global solar radiation, snow depth, and wind speed) are obtained from Agro-Meteorological Grid Square Data, NARO. Residential solar PV installation data is provided by the Japan Photovoltaic Energy Association. Our baseline fixed-effects specification employs cooling degree days (CDD) and heating degree days (HDD) as measures of heat and cold exposure.

Our findings indicate that residential solar PV installations significantly reduced the adverse temperature impacts on health outcomes, particularly among individuals aged 65 and older. These results underscore the critical role of renewable energy technology in enhancing resilience to extreme temperatures and volatile energy prices.

These findings highlight the need for policies promoting renewable energy adoption, particularly in vulnerable regions and sociodemographic groups. Subsidies and incentives for residential solar PV installations could offset upfront costs, enabling broader adoption among low-income households. Governments should prioritize integrating renewable energies into public health strategies to protect at-risk populations, such as the elderly. By reducing reliance on conventional energy sources and increasing energy affordability, renewable energy diffusion can mitigate health risks linked to energy insecurity and climate change. In doing so, it offers dual benefits of improving public health and advancing energy sustainability goals. 2

1:30 PM –3:00 PM TUESDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Lotus

Healthcare System, Community, and Social Programs

MODERATOR: **Paul Kuwornu**,

Ind-167 Community Education and Surveillance of Antibiotics use: Experimental Evidence From Nepal

PRESENTER: **Prajwol Nepal**

AUTHORS: Henish Shakya, Yubraj Acharya, Anup Subedee

Abstract.

Background. Antimicrobial Resistance (AMR) poses a significant threat to global health, contributing to an estimated 4.95 million deaths in 2019. In low- and middle-income countries (LMICs), overuse of antibiotics — driven by easy access and limited public awareness — is a key factor in the rise of AMR. The World Health Organization (WHO) has called for public awareness campaigns that promote the appropriate use of antibiotics and highlight the growing risks of AMR. However, such initiatives remain scarce in LMICs, and existing efforts often lack contextual adaptation and rigorous evaluation to guide policy development. This study evaluates the impact of a targeted educational intervention aimed at reducing non-prescription antibiotics use among children in a randomized controlled trial conducted in Kathmandu, Nepal.

Methods. We enrolled 960 households across 40 wards in urban Kathmandu Valley, and randomly assigned them 50:50 to a control arm and an educational intervention aimed at enhancing parental understanding of antibiotic use in children and the associated AMR risks. The intervention included in-person sessions between parents of children under 10 years and a trained community health nurse during household visit, supplemented by periodic video messages delivered through a mobile application. The mobile application, adapted from widely used community health worker mHealth tool, also enabled households to report antibiotic use, healthcare visits, and expenditures on antibiotics and other medications, for each illness episode over a period of six months.

Key Findings. Our analytical sample** consisted of 238 illness episodes from 144 households during the six-month period. Antibiotics were used in 42% of the total illness episodes, and 65% of these were without physician prescription. The intervention reduced non-prescription antibiotic use by 41% (13.4 percentage points (pp), $p < 0.05$). Households in the intervention group were more likely to seek advice at a hospital or a clinic (29 pp, $p < 0.01$) as opposed to directly visiting a community pharmacy, incurring higher costs on medicines including antibiotics (58%, $p < 0.05$). Conditional on using antibiotics, those in the intervention arm were less likely to use Watch or Reserve categories of antibiotics (according to WHO categorization) without physician oversight (22.1 pp, $p < 0.05$). Overall antibiotics use, however, remained similar across both groups. Treatment effects on non-prescription antibiotic use were concentrated among children with a reported illness episode in the three months preceding the household visit and among parents with the lowest baseline knowledge of antibiotics and AMR.

Policy Implications. This study is among the first to evaluate the impact of public awareness campaigns on AMR in LMICs, using a phone-based application to track antibiotic consumption. We find widespread non-prescribed antibiotic use among children, but our results are encouraging — a contextually adapted, multifaceted educational intervention significantly reduced non-prescription use and increased the likelihood of households seeking care in formal health facilities. While this study informs policy efforts to reduce AMR in Nepal, both the educational intervention and the phone-based surveillance system can serve as prototypes for tackling AMR in LMICs.

Ind-969 Assessing the Role of Special Disability Schools in Shaping Labor Market Outcomes for Indonesians with Disabilities

PRESENTER: **Anu Rammohan**

AUTHORS: Mohammad Farhad, Rumayya Rumayya, Ilmiawan Auwalin

Background: Disability has the potential to exacerbate existing vulnerabilities, and previous research has found evidence of an employment gap for persons with disabilities (PwD). Indonesia has approximately 22.97 million PwDs, constituting around 8.5% of the population. Despite this significant demographic, PwDs accounted for only 0.53% of the workforce in 2022, according to the Indonesian Central Statistics Agency (BPS). Special schools, often referred to as SLBs (*Sekolah Luar Biasa*) were introduced in 2003 by the Government of Indonesia (National Education System Law No. 20/2003) to cater to students with special needs and disabilities, offering a specialised curriculum and infrastructure. International literature is ambiguous on whether Special schools or Inclusive education are better for labour market integration of PwD. However, despite special schools for PwD being an important policy initiative of the Government of Indonesia, there is no research on the labour market outcomes of PwD who attended Special Schools. **Aim and methods:** This paper uses nationally representative data on working-age PwD from the Indonesian Labor Force Survey (SAKERNAS) to empirically analyse employment outcomes of Indonesian adults who were educated in Special schools for PwD relative to their disabled counterparts who received an inclusive education. We estimate multivariate regression models for employment outcomes, controlling for an array of individual socio-economic and demographic characteristics. **Results:** Our study shows that: (i) attendance at Special schools is associated with a 3.1 percentage points lower probability of being employed relative to PwD who received an Inclusive education; (ii) those PwD with severe disabilities who attended Special Schools had a 28.3 percentage points higher probability of being employed relative to those PwD who attended General schools.

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Ind-976 Optimising Blood Management Systems in England: Evaluating the Impact and Cost Efficiency of Electronic Blood Transfusion Systems in NHS Hospitals

PRESENTER: **Florian Tomini**, Queen Mary University of London, UK

AUTHORS: Mike Murphy, Simon Stanworth, Sophie Staples, Laura Green, Hayley Evans, Antony Palmer, Paula Dhiman, Hiro Farabi

Electronic Blood Transfusion Systems (EBTs) offer significant potential to improve patient safety, operational efficiency, and digital traceability within NHS transfusion practice. These systems include electronic bedside systems (EBSs), electronic blood ordering (EBO), electronic blood fridges (EBFs), and traceability platforms. While EBTs are increasingly adopted, their impact on blood stock management, wastage, and broader service efficiency remains under-evaluated.

This study assessed the adoption and effects of EBTs through a national survey (June–September 2023) and linked transfusion inventory data from 2000 to 2022. Difference-in-differences models with propensity score matching were used to estimate the impact of EBT implementation on red blood cell (RBC) wastage and stock indicators.

Responses were received from 55.6% (114/206) of NHS hospitals in England, with 66.7% (76/114) reporting adoption of at least one EBT component. Electronic blood fridges were the most widely implemented, adopted by 57.5% (66/114) of respondents. However, full adoption of all EBT components remained uncommon.

Matched analysis showed that EBT implementation—particularly electronic blood fridges—was associated with a 13.4% reduction in avoidable RBC wastage and a 14.8% reduction in time-expired wastage. This translates to an estimated £4.4 million annual cost saving across the NHS.

Yet the real value of EBTs extends beyond cost, in reducing pressure on limited donor blood supplies, enhancing system resilience, and supporting digital transformation. These broader clinical and operational benefits—such as improved traceability, emergency responsiveness, and staff efficiency—remain to be fully quantified.

Ind-1331 Analyzing the Efficiency of Health Systems: A Systematic Review of Literature

PRESENTER: **Rahab Mbau**

AUTHOR: Edwine Barasa

Background Efficiency refers the use of resources in ways that optimize desired outcomes. Health system efficiency is a priority concern for policy makers globally as countries aim to achieve universal health coverage and face the additional challenge of an aging population. Efficiency analysis in the health sector has typically focused on the efficiency of healthcare facilities (hospitals, primary healthcare facilities), with few studies focusing on system level (national or sub-national) efficiency. We carried out a thematic review of literature that assessed the efficiency of health systems at the national and sub-national level. **Methods** We conducted a systematic search of PubMed and Google scholar between 2000 and 2021 and a manual search of relevant papers selected from their reference lists. A total of 131 papers were included. We analyzed and synthesized evidence from the selected papers using a thematic approach (selecting, sorting, coding and charting collected data according to identified key issues and themes). **Findings** There were more publications from high- and upper middle-income countries (53%) than from low-income and lower middle-income countries. There were also more publications focusing on national level (60%) compared to sub-national health systems' efficiency. Only 6% of studies used either qualitative methods or mixed methods while 94% used quantitative approaches. Data envelopment analysis, a non-parametric method, was the most common methodological approach used, followed by stochastic frontier analysis, a parametric method. A range of regression methods were used to identify the determinants of health system efficiency. While studies used a range of inputs, these generally considered the building blocks of health systems, health risk factors, and social determinants of health. Outputs used in efficiency analysis could be classified as either intermediate health service outputs (e.g., number of health facility visits), single health outcomes (e.g., infant mortality rate) or composite indices either intermediate outputs of health outcomes (e.g., Health Adjusted Life Expectancy). Factors that were found to affect health system efficiency include demographic and socio-economic

characteristics of the population, macro-economic characteristics of the national and sub-national regions, population health and wellbeing, the governance and political characteristics of these regions, and health system characteristics. **Conclusion** This review highlights the limited evidence on health system efficiency, especially in low- and middle-income countries. It also reveals the dearth of efficiency studies that use mixed methods approaches by incorporating qualitative inquiry. The review offers insights on the drivers of the efficiency of national and sub-national health systems, and highlights potential targets for reforms to improve health system efficiency.

Ind-1567 Integrated Care as a Mean to Provide Financial Risk Protection: The Case of Integrated Community Case Management (ICCM) in Uganda

PRESENTER: **Bryan Patenaude**
AUTHORS: Gatien de Broucker, Elizabeth Ekirapa Kiracho, Anthony Ssebagereka

Background

Since 2008, in Uganda, public healthcare facilities offer healthcare free of charge to all residents. However, shortcomings in access to primary care and in care continuity marred the effectiveness of public healthcare, particularly for its poorest citizens: pneumonia, diarrhea, malaria, and malnutrition remained leading causes of morbidity and mortality in deaths in children under 5. In 2010, Uganda extended the management of these diseases with Integrated Community Case Management (ICCM) – training community health workers and deploying them as part of the healthcare force mandated to tackle these child health issues.

Although the program faces several challenges, including sometimes shifting the cost of care incurred by community health workers to users, it confers considerable benefits, easing referrals and promoting access to public healthcare services for the targeted illnesses. As ICCM targets more disadvantaged communities, this aspect is promising as these infectious diseases can pose a significant economic burden. While ICCM seems to improve how caregivers navigate the healthcare system, we don't know whether it will reduce their economic cost.

Research questions

What is the economic burden of ICCM-covered disease for poorer households? Do caregivers who follow the care-seeking pathway planned by ICCM see reduced costs? Are they less likely to experience catastrophic health expenditures?

Methods

The analysis used data collected in 2018 through the Decade of Vaccine Economics project led by Johns Hopkins and Makerere Universities, which estimated the cost of pneumonia, diarrhea, and measles treated in public and private facilities in Uganda. We ran a benefit-incidence analysis to describe the utilization of government-funded healthcare facilities compared to private facilities across patients of different wealth status and seeking care for ICCM-covered diseases. We compared the benefits and costs incurred by caregivers who followed the care-seeking pathway in ICCM guidelines against those who did not, and those who sought care for measles. Measles was also included in the analysis for comparison as a disease not covered by ICCM in Uganda.

Four outcomes were included as benefits and costs. Public healthcare expenditure (PHE), defined as the total cost incurred by public facilities to treat a case, was a measure of direct health benefit to caregivers. Out-of-pocket payments (OPP) covering medical and non-medical expenses were a measure of direct cost to caregivers. We included as measures the indirect cost to caregivers the time spent receiving healthcare and the distance traveled to a health facility.

Key results

Preliminary results show that, expectedly, poorer healthcare users benefited most from PHE for all three diseases (concentration indices from -0.169 to -0.244), while most costs (OPP, time, distance) for pneumonia and diarrhea were allocated to more affluent users (0.077 to 0.346). Not so much for measles, where highly pro-poor PHE (-0.244) failed to reduce OPP for the poorest users (0.028).

Conclusions and implications

The public sector substitutes more effectively OPP with PHE for disease covered by ICCM than for measles. Expanding ICCM to respond to disease outbreaks could complement well, and likely at low-cost, existing treatment and prevention strategies to ensure better financial risk protection for everyone.

Ind-1635 Evidence of Incentivizing Secondary Hospitals to Reduce Claims on Tertiary Hospitals in Indonesian National Health Insurance (NHI)

PRESENTER: **Diah Eva Sari Husnul Khotimah**
AUTHORS: Anastasia Susanto, Hasbullah Thabrany, Iko Safika, Riris Dian Hardiani, Yusuf Subekti, Dini Kurniawati

Background.

Health services in Indonesian hospitals under the NHI scheme are reimbursed prospectively through the Indonesia Case-Based Groups (INA-CBG) payment system. The INA-CBG tariff had remained unchanged since 2016, until January 2023, when the Ministry of Health introduced a revised tariff structure. This adjustment incorporates hospital classification, which in Indonesia is uniquely determined by the number of hospital beds. Previously, the tariff for identical procedures was higher for Class A hospitals (minimum 250 beds) compared to Class B (minimum 200 beds), Class C (minimum 100 beds), and Class D (minimum 50 beds). The 2023 revision includes a tariff increase for outpatient

services, which are now 19.1%, 37.0%, 39.7%, and 40.0% higher for tertiary (Class A) and secondary hospitals (Classes B, C, and D), respectively, reducing the disparity between these categories. Similarly, inpatient tariffs increased by 11.1%, 15.30%, 15.8%, and 11.9% for Class A, B, C, and D hospitals, respectively. This study evaluates the impact of the revised INA-CBG tariffs on hospital revenue and service utilization within the Indonesian National Health Insurance (JKN) program

Method

This study utilized e-claim data from the Ministry of Health, encompassing 232 million claims submitted by all hospitals in Indonesia contracted by the Social Insurance Administering Body for Health (BPJSK), which oversees the National Health Insurance (JKN) program. A descriptive analysis was performed to evaluate hospital revenue and service utilization before and after the 2023 tariff adjustment for both outpatient and inpatient services.

Key variables analyzed included hospital ownership (public or private), hospital location (categorized by regions 1 to 5 as defined by the Ministry of Health), and hospital ward class (Class I, II, or III). Ward classifications were based on the number of beds per room: Class I wards accommodate up to 2 beds per room, Class II up to 4 beds, and Class III up to 6 beds.

Results

There was a 24.8% increase in hospital revenue from outpatient services in Class A hospitals, which was notably lower than the increases observed in Class B, C, and D hospitals, at 43.9%, 36.5%, and 42.0%, respectively. Similarly, revenue from inpatient services increased by 37.2% in Class A hospitals, compared to 46.4%, 46.2%, and 46.2%, in Class B, C, and D hospitals, respectively.

The utilization of both outpatient and inpatient services was also considerably lower at class A hospitals than those of class B, C, and D hospitals (outpatient: 21.7% vs 35.4%, 30.4%, and 34.0%; inpatient: 26.9% vs 33.1%, 33.5%, and 34.8%, respectively).

Conclusion and recommendations

The tariff increase for secondary hospitals appears to reduce utilization at tertiary hospitals, potentially reflecting improved access to secondary care. However, cost-containment measures are needed to ensure system sustainability. Further research should explore the impact of tariff changes on health outcomes to confirm whether increased utilization aligns with improved care quality and equity.

Ind-1679 Did Incentive for Vaginal Delivery in Primary Care Settings Shift Healthcare Cost in Indonesia s National Health Insurance Program?

PRESENTER: **Aditya Darmasurya**, BPJS Kesehatan
AUTHORS: Bayu Yudanto, Rahma Anindita

Background:

Vaginal delivery referrals from primary care to hospital care shows an increasing trend in Indonesia's National Health Insurance(JKN) Program. This leads to an increase of expenditure in hospital care from 420 million USD in 2019 to 483 million USD in 2022. Urban areas show more hospital vaginal delivery utilization than that of rural areas. In January 2023, a raise in fee-for service tariff for vaginal delivery as an incentive in primary care level was issued. This was intended to reduce referrals to hospitals and prevent unnecessary healthcare costs. Was there any difference on vaginal delivery referral rates between urban and rural areas after the policy implementation? Did the incentive create cost savings hence shifting healthcare cost?

Objectives:

We investigated whether the vaginal delivery incentive in primary care settings was associated with a reduction of referral rates hence creating cost savings in urban and rural areas.

Methods:

We used a non-experimental big data analysis in this study. An observational descriptive method was applied. Healthcare data on vaginal delivery services and costs were taken from BPJS Kesehatan E-database. Serial data from 2019 to 2023 were analyzed. Healthcare data in Java, Bali, and Sumatera provinces were classified as urban data, while data in Nusa Tenggara, Kalimantan, Sulawesi, Maluku, and Papua provinces were classified as rural data.

Results:

An overall vaginal delivery data from 75 million female JKN members aged 15 to 50 years old were analyzed. In urban areas, the referral rate increased from 62 percent in 2019 to 69 percent in 2023. In rural areas, the increase was less than that of urban areas: from 63 percent in 2019 to 65 percent in 2023. However, the number of primary care vaginal delivery cases in rural areas increased compared to that of urban areas. There was an increase of 112 thousand cases per year in rural areas, while in urban areas there was a decrease of 54 thousand cases per year. Based on the number of cases in 2023, there was no cost savings made in urban areas. Even so, in rural areas the cost saving reached 2.3 million USD per year.

Conclusion:

Although the incentive policy did not show a decrease of referral rates in both urban and rural areas, the referral rate in rural areas were more

controlled than that of urban areas. Shift of healthcare costs were only seen in rural areas as indicated by the cost savings made. This was may be due to specialist care in urban areas were more accessible than that in rural areas. It was also possible that patients' perception that specialist doctors are more competent in treating vaginal delivery cases may be more apparent in urban aeas. Further studies are needed to evaluate the policy effect on behavioural characteristics. This study encourages further incentive policies to address area distinctiveness in order to shift healthcare costs to primary care settings.

Key words:

Vaginal delivery, incentive, referral rate, cost saving

Ind-2125 Impact Of Non-Specialistic Time, Age, Comorbidity, Complication (TACC) Referrals Under National Health Insurance

PRESENTER: **Khaterina Manurung**
AUTHORS: Dedy Revelino Siregar, Wan Aisyiah Baros, Donni Hendrawan, Mahlil Ruby

Backgrounds: The role of First Level Health Facilities in providing effective and efficient services is the concept of Primary Health Care in strengthening Primary Health Facilities as gatekeepers capable of handling 144 diagnoses completely and independently. TACC (Time, Age, Comorbidity, Complication) criteria are used by doctors to refer 144 types of Primary Health Facilities diagnoses which are level 4 competencies of primary doctors to advanced services. However, there is currently no evaluation of the use of TACC for Non-Specialist Referrals related to the purpose of using TACC, the appropriateness of the choice of TACC, the accuracy of the choice of diagnoses that become complications/comorbidities. Effective primary health facilities and referral systems are key to achieving better quality of health care. The aim of this study was to provide an evaluation and recommendations for improvement in TACC Non-Specialist Referrals. **Methods:** Cross sectional method with quantitative data was used in this study with variable data on demographics, visits and costs of Hospital Outpatient TACC Non-Specialist Cases and Primary Care Outpatient TACC Non-Specialist Referral visits data from 2019-September 2024. **Results:** The TACC Non-Specialist Referral rate was higher than the Non-Specialist Referral rate above the Non-Specialist Referral target of 2% with a total of 4,771,831 referrals in the period 2019-September 2024. TACC Non-Specialist Referrals in the same period, referred with the most criteria using Time at 62% and Age at 20%. The highest referrals derived from TACC Non-Specialist Referrals were made by Outpatient Primary Health Facilities amounting to 3,695,374 where 74% of all total collaborating Primary Health Facilities were Outpatient Primary Health Facilities. The Outpatient Primary Health Facilities referred with the highest Time criteria with diagnoses of Myopia and Disorder of refraction, unspecified. While on the Age criterion were the diagnoses of Essential (primary) hypertension and Non-insulin-dependent diabetes mellitus. The highest diagnoses on the Complication and Comorbidity criteria were Myopia and Disorder of refraction, unspecified and Essential (primary) hypertension. Participants who were referred to Hospitals were mostly from the Formal Sector segment (41%), followed by Contribution Beneficiary participants (27%) who came from government-owned Puskesmas (51%) and the next came from Primary Clinics (40%). The impact of health cost inefficiencies in the same period was IDR 950 billion in outpatient care which are non-specialist cases at Hospitals. **Conclusions:** Currently, TACC Non-Specialist Referrals have not been set target limits that must be referred to Hospitals because they are not yet included in the performance calculation component in Performance-Based Capitation. The selection of TACC criteria for Non-Specialist Referral diagnoses is not in accordance with the definition of the criteria so it is necessary to evaluate the use of TACC and not as a condition for passing referrals. There is potential inefficiency in the cost of health services at Hospitals, which needs to be re-evaluated.
Keywords: Non-specialist referral, gate keeper, Time, Age, Comorbidities, Complications.

Ind-2200 Quality of Service & Supply Infrastructure Financing in Increasing JKN Member Satisfaction

PRESENTER: **Mardiana Mardiana**
AUTHOR: Mr. Mahlil Ruby

Abstract

Introduction: BPJS Kesehatan, as the governing body for Indonesia's National Health Insurance (NHI) program, plays a critical role in ensuring member satisfaction to strengthen public trust in the program's implementation. Member satisfaction is a measurable indicator of health service quality, determined by comparing the expected standards of service with the members' actual experiences. Quality of service is influenced by the provider's ability to consistently meet or exceed these expectations. Beyond physical health recovery, member expectations also encompass various dimensions, including the professionalism, competence, and communication skills of service providers, the availability and accessibility of information, as well as the adequacy of facilities and the physical environment in which services are delivered.

Method: This study aims to evaluate the relationship between health facility services and the satisfaction levels of JKN members. This research uses a literature study method to obtain secondary data in the form of results from previous research and other relevant sources.

Result: A review of existing literature and an analysis of SIF implementation suggest that the quality of services provided by health facilities is a significant determinant of member satisfaction. Health facilities are required to enhance their infrastructure, increase working capital, provide comprehensive medical equipment, and expand service points to fulfill their commitment to maintaining service quality for JKN members.

Conclusion: The 2023 Member Satisfaction Survey identified key indicators of satisfaction, such as the adequacy of infrastructure, the condition of waiting areas and seating, the availability and sophistication of medical devices, and the accessibility of health facilities. To address these requirements, BPJS Kesehatan collaborates with partner banks to provide Supply Infrastructure Financing (SIF), enabling health facilities to access business development funds.

Keywords: Quality, Service, Infrastructure.

Ind-2245 Program Evaluation for Enhanced Health System Performance via District Coordination Meetings

PRESENTER: **Emilienne Carine Bieme-Ndi**, Clinton Health Access Initiative
AUTHORS: Michael Budzi, Nadege Nnang, Shalom Ndoula, Clarence Mbanga, Yauba Saidu, Choice Okoro, Sibenu Njike, Ms. Jeniffer Adungosi

Introduction: Health systems in low- and middle-income countries face significant inefficiencies that hinder equitable access to essential services, often leaving vulnerable populations underserved. In Cameroon, these challenges are exacerbated by fragmented governance, poor data quality, and limited coordination, all of which undermine efforts to achieve improved immunization coverage as well as health outcomes. Regular reviews of program data are crucial for monitoring performance and ensuring effective service delivery. Through systematic data analysis, issues such as service delivery and resource allocation disruptions can be identified and addressed, ensuring that essential services reach those in need. Despite these strategies, critical gaps remain at lower levels of the health system, particularly in district-level coordination. Monthly coordination meetings, essential for data review and decision-making, are hindered by governance, administrative, and logistical challenges. In response, the Expanded Program on Immunization (EPI), supported by CHAI, conducted a situational analysis to address these gaps by enhancing performance reviews, improving data utilization, and ensuring the timely availability of resources for informed decision-making. **Methodology:** This study, conducted from July to October 2023, aimed to evaluate the effectiveness of district-level coordination meetings in Cameroon's health districts. A **qualitative research design** was employed, utilizing key informant interviews with 10 regional EPI managers, 10 regional chief of planning and 24 District Medical Officers (DMOs) and 24 chiefs of health centers across 10 regions. Purposeful sampling was used to select participants for interviews. **Results:** Coordination meetings are essential for the efficient functioning of health districts. They facilitate data analysis, performance review, and strategic planning, leading to improved data quality, personnel management, community mobilization, and overall program effectiveness. However, challenges such as limited resources, inadequate supervision, and personnel shortages hinder the full potential of these meetings. Overlapping activities, transportation constraints, and communication issues further complicate the situation. To enhance the efficiency of coordination meetings and improve health system performance, it is crucial to address these challenges. This may involve: - Securing adequate funding to support meeting logistics, staff training, and transportation. - Implementing effective supervision mechanisms to monitor health facility performance and ensure adherence to guidelines. - Investing in staff training to improve data management, analysis, and interpretation skills. - Enhancing communication channels within the district to facilitate information sharing and collaboration. - Focusing on key priorities and avoiding overlapping activities to optimize resource utilization. **Conclusion:** District-level coordination meetings are vital for effective communication, monitoring, and addressing health system challenges at the local level. They provide a platform for stakeholders to share information, collaborate, and make data-driven decisions. **Implications for Policy and Practice:** This study underscores the importance of strengthening district-level coordination meetings to ensure effective health system performance. By addressing logistical constraints, enhancing data utilization, and integrating supply chain management into these meetings, policymakers can further optimize resources and improve healthcare delivery. Effective coordination and performance management at the district level are essential for achieving equitable health outcomes and ensuring that essential services are accessible to underserved populations.

Ind-2467 Age-friendly Neighborhood Environment and Trajectories of Multimorbidity: The Moderating Effect of Life-course Socioeconomic Status

PRESENTER: **Jing Liu**
AUTHORS: Tao Zhang, Xiaoqian Gong, Kuanlie Jiang

Background & Objectives: Limited longitudinal research exists on the combined effects of environmental factors and life-course socioeconomic status (SES) on multimorbidity in China. This study aims to explore the cumulative impact of age-friendly neighborhoods on multimorbidity over time, focusing on SES moderation. **Research Design & Methods:** Analyzing data from 10,125 participants in the China Health and Retirement Longitudinal Survey (2011-2020), this study assessed multimorbidity through self-reported chronic diseases and evaluated neighborhood environments using eight domains from the Age-Friendly Cities and Communities framework. Childhood and adulthood SES were measured using latent class analysis. Latent growth curve models examined the effects of neighborhood environment, life-course SES, and their interactions on multimorbidity. **Results:** The study found a statistically significant increase in multimorbidity over time, with an intercept of 0.514 and a slope of 0.085. Notably, government support showed an independent association with the baseline number of chronic diseases ($\beta = -0.078$, $p < 0.1$). The interaction between government support and childhood SES was also significant ($\beta = -0.183$, $p < 0.05$), suggesting that unfavorable childhood SES could reduce the protective effects of government support. Additionally, adulthood SES interacted with factors such as information infrastructure ($\beta = -0.068$, $p < 0.001$) and neighborly support ($\beta = -0.092$, $p < 0.1$), and transportation interacted with childhood SES ($\beta = -0.028$, $p < 0.05$), all negatively affecting the rate of change in multimorbidity. These findings suggest that individuals with higher SES derive greater benefits from these age-friendly neighborhood environment domains compared to their lower SES counterparts. **Discussion & Implications:** Age-friendly neighborhoods with strong government support, neighborly support, and developed infrastructure slow multimorbidity progression. However, these benefits are influenced by life-course SES. Policymakers should consider disadvantaged populations' access to environmental resources and address potential neighborhood socioeconomic health inequalities.

Ind-2562 Effect of Illinois' HBIA/HBIS Insurance Programs for Undocumented and Non-Citizen Immigrant Seniors on Hospitals' Uncompensated Care

PRESENTER: **Aresha Martinez-Cardoso**
AUTHORS: Bin Yu, Apurva Nayak

Background: Latinxs are aging faster than other racial/ethnic group in the US. By 2050, they are projected to be the largest share of the immigrant, older population. As Latinx immigrants age, however, they experience the fastest decline in health and emerging health disparities, despite having an initial health advantage. Limited access to health insurance and delayed healthcare utilization is a major determinant of health disparities in older age among Latinx immigrants. Research on how health insurance and access shape health disparities among aging Latinxs is

limited by (1) confounding between insurance and immigration and socioeconomic characteristics that shape health and (2) simultaneous changes in insurance access and lifecourse aging as Latinxs enter older adulthood.

Objective: To address these challenges, this study leveraged a policy intervention in Illinois to study changes in Illinois hospitals' uncompensated care using quasi-experimental methods. In 2020 and 2022, Illinois launched the Health Benefits for Immigrant Seniors (HBIA) and Health Benefits for Immigrant Adults (HBIA) programs, which were the first state policies that extended coverage equivalent to full-scope Medicaid to low-income undocumented immigrants and noncitizens ages 42 and older; the majority (58%) of HBIA/HBIS enrollees (n=67,310) were Latinx.

Methods: We use Medicare Costs data, HBIA/HBIS enrollment data, and county-level American Community Survey to compute annual levels of uncompensated care from 2018-2023 stratifying hospitals into high and low HBIA/HBIS enrollment counties. We then employ difference-in-differences models to study the impact of HBIA and HBIS on annual uncompensated care in Illinois hospitals, with comparisons to Indiana and Wisconsin.

Results: We find that HBIA and HBIS were associated with reductions in hospitals' charity (HBIS: $960,115, s.e. 253,405, $p<0.01$; HBIA: $1.15 million, s.e. 272,333, $p<0.01$) and total uncompensated care (HBIS: $2.73 million, s.e. 1.17 million, $p=0.02$; HBIA:$3.96 million, s.e. 1.3 million, $p=0.002$). Furthermore, counties with high proportions of immigrants experienced larger reductions in charity care associated with the policy, while counties with high proportions of enrollees relative to eligible immigrants experienced larger reductions in bad debt and charity care.

Conclusion: This study leverages a novel policy in a major immigrant state to examine how health insurance shapes healthcare delivery and costs. To our knowledge, this is the first study to examine the effects of Illinois HBIA/HBIS policies. The study contributes to scholarship on the drivers of health disparities among the growing aging immigrant population, and policy debates to expand health insurance to undocumented and noncitizens excluded from healthcare.

Ind-399 The Political Effect of Health Insurance: Evidence From the Implementation of Urban-Rural Resident Basic Medical Insurance in China

PRESENTER: **Dan Cao**, Xi'an Jiaotong University
AUTHORS: Yangling Ren, Bo Li

Background In 2016, China proposed to integrating Urban Resident Basic Medical Insurance and New Rural Cooperative Medical Insurance, and establishing urban-rural resident basic medical insurance (URRBMI). As a vital measure to break the dual division system of city and countryside, few studies examined whether the implementation of URRBMI helped build citizen trust of rural residents. In this study, we attempt to explore the political effect of URRBMI in China. **Methods** By using data from 4 waves of the China Family Panel Study, a difference-in-difference model was set and common trend test was adopted for the statistical analysis. We excluded those who weren't rural residents and who didn't participate in basic medical insurance. To ensure the sample was potential beneficiaries of URRBMI, the final sample finally included only hospitalized patients and their families, which contained 19643 respondents. **Results** We found that the trust score in local government of Chinese rural residents increased 0.374 after the implementation of URRBMI, by increasing the compensation fee of rural residents and their families, and residents' satisfaction towards health system. This study also revealed the heterogeneous effect of URRBMI on trust in local government. We found that the integration had more significant effects in people with chronic conditions, middle-aged and elderly residents, high-income residents and people with high social trust. **Conclusions** These empirical results helped people understand whether and how Chinese URRBMI policy generated political effect. It provided a comprehensive analysis of how to enhance residents' political through the reform of health insurance scheme. The mechanism and heterogeneity results implies that the basic health insurance in China need furtherly improve its compensation rate and the health resource allocation in rural area, and the disadvantaged such as chronic patients and elderly should be paid more attention to. What's more, social trust is also important to increase political trust through health insurance policy.

1:30 PM –3:00 PM TUESDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Bougainville

New Methods in Program Evaluations

MODERATOR: **Erin Strumpf**, McGill University

Ind-962 Difference-in-Differences with Unpoolable Data (UNDID)

PRESENTER: **Erin Strumpf**, McGill University
AUTHORS: Sunny Karim, Matt Webb, Nichole Austin

Difference-in-differences (DID) is commonly used to estimate treatment effects but is infeasible in settings where data are unpoolable due to privacy concerns or legal restrictions on data sharing, particularly across jurisdictions like countries or states. When treatments or policies vary at the country level, data from treatment and control units may not be able to be combined. Examples include health care data from different insurers (e.g., Canadian provinces, private and public insurers, all-payer claims databases across states), restricted-use micro-data held in secure environments (e.g., vital statistics, income tax, business data held in Statistics Canada's or the US Census Bureau's Research Data Centres), and

electronic health records federated across countries (e.g., the European Health Data Space). In this study, we identify and relax the assumption of data poolability in DID estimation. We propose an innovative approach to estimate DID with unpoolable data (UN-DID) which can accommodate covariates, multiple groups, and staggered adoption. Through analytical proofs and Monte Carlo simulations, we show that UN-DID and conventional DID estimates of the average treatment effect and standard errors are equal and unbiased in settings without covariates. With covariates, both methods produce estimates that are unbiased, equivalent, and converge to the true value. The estimates differ slightly but the statistical inference and substantive conclusions remain the same. Two empirical examples with real-world data further underscore UN-DID's utility. The UN-DID method allows the estimation of cross-jurisdictional treatment effects with unpoolable data, enabling better counterfactuals to be used and new research questions to be answered.

abs-os666 A Pooled Regression Approach to Estimating Difference-in-Difference Models With Multiple Treatments and Correlated, Staggered Timing

PRESENTER: **Partha Deb**

The difference-in-differences (DID) study design is an important tool for causal inference in economics. In recent years, there has been an extraordinary number of new theoretical papers on how to obtain DID estimates in regression-based implementations of these study designs. In particular, the discovery that the two-way fixed effects estimator of a model with a constant treatment effect can produce biased estimates of treatment effects when there is staggered treatment timing and heterogeneous treatment effects, has led to new approaches for dealing with both staggered timing and heterogeneous treatment effects (e.g. Borusyak et al, 2024, Callaway and Sant'Anna, 2021, Deb et al, 2024, and Sun and Abraham, 2021).

In many applications, however, the researcher is interested in multiple events that are related to each other and occur during the sample period with correlated, but not concurrent, timing. In other applications, while the researcher may be interested in one event, they are worried about the confounding events with correlated timing. In such circumstances, Chaisemartin and d'Haultfoeuille (2023) and Tsai (2024) show that both the TWFE regression with multiple event indicators and the staggered DID estimators designed for use with one treatment are biased in the presence of confounding events. Each develops a new approach, but both are complex to implement.

In this paper, I extend the framework in Deb et al (2024) to the case of multiple events with correlated timing. Identification of the group-time level effects of each treatment requires the existence of not-yet-treated units for each event. The regression specification turns out to be a straightforward extension of the specification in Deb et al (2024). Average treatment effects on the treated can be recovered for each event taken individually and, in principle, for all combination of the events, although these can be difficult to identify in finite samples with more than just a few event-types.

I apply this method to an examination of the effects of punitive and priority prenatal substance use policies (PSUP) for expecting mothers on their mental health outcomes. I use data from the Behavioral Risk Factor Surveillance System from 2005-2018. The representative sample of women of child-bearing age with at least one child from 34 states has 440,446 observations. There is considerable variation in the timing of the start of the policies at the state level. Between 2007 and 2018, 13 states enacted punitive PSUP. Between 2008 and 2016, 9 states enacted priority PSUP. Four states enacted both types of policies, albeit not at the same time. Finally, 18 states had no PSUP.

The results show that the TWFE estimator that simply allows for 2 policies produces biased estimates for the effects of each policy and for the effect of both policies implemented simultaneously. The staggered DID estimator that takes one treatment at a time also produces biased estimates (and cannot produce estimates for both policies together). The regression-based estimator produces intuitive estimates of a variety of ATET.

abs-os668 A New Approach to Evaluation Using Observational Data That Combines Instrumental Variable and Machine Learning Regression Models

PRESENTER: **Mr. Stephen O'Neill**, London School of Hygiene & Tropical Medicine (LSHTM)
AUTHOR: Richard Grieve

Precise subgroup-specific estimates are essential for informing targeted or personalized treatment decisions, but current approaches to generating policy-relevant evidence are inadequate. Randomized Controlled Trials (RCTs) are often underpowered for subgroups, and observational studies are vulnerable to confounding by indication (selection bias). If a valid instrumental variable (IV) is available this can reduce bias, the resultant estimates are often highly uncertain, particularly when the IV is not strong. Moreover, IV estimates may be sensitive to the choice of model specification, particularly where interest lies in estimating heterogeneous effects.

These methodological challenges are exemplified in a new evaluation of the comparative effectiveness of Surgery Or Radio-Therapy (the SORT study) for non-small cell lung cancer (NSCLC) that uses UK cancer registry data. The primary endpoint is 2-year all-cause mortality. The study considers subgroups that include age, sex, cancer stage, frailty, and performance score. The IV, historic provider preference, is expected to be relatively weak for some subgroups due to sample size constraints, exacerbating concerns about precision.

To address these challenges, we build on prior work combining IV and regression approaches by extending them with machine learning methods that are less prone to model misspecification. Specifically, we adapt the Hansen-Stein estimator (Hansen, 2017), which balances bias and efficiency by averaging OLS and 2SLS estimates, to employ forest-based approaches. We develop a novel estimator (Forest-Stein) which combines causal forests (CF) and IV forests (IVF) to enhance model robustness in the face of weak instruments and small samples, while allowing for more flexible model specification.

We conduct a Monte Carlo simulation study to assess the relative performance of our proposed estimator Forest-Stein compared to OLS, 2SLS,

Hansen-Stein, CF, and IVF estimators.. We define a simple DGP, with eight observed covariates some of which influence treatment, outcomes or them both, an unobserved confounder and a binary instrument (Z). We define a subgroup indication G that influences treatment and the outcome. The true effect is defined to differ by subgroup. We estimate an overall effect and effects for two subgroups (G=0 and G=1), varying the sample size {500, 1000, 5000} and IV strength from completely irrelevant to very strong. We report absolute bias and RMSE in training, testing and hold out samples

We show that in line with findings for Hansen-Stein approach using OLS and 2SLS, our Forest-Stein estimates tend towards the causal forest estimates as the IV becomes weaker, while tending towards the IV forest estimates as the IV becomes stronger, guarding against imprecision associated with weak instruments in smaller samples.

Ongoing work will expand the simulations study to consider non-linear outcome model specifications where we anticipate Forest-Stein will outperform Hansen-Stein, and consider different forms of effect heterogeneity and varying levels of unobserved confounding and instrument strength. Finally, we illustrate the performance of the approach in the SORT case study to address the challenge of estimating heterogeneous effects for all subgroups of policy relevance including those where there is a concern that the IV may not be strong.

Ind-2362 Revisiting the Causal Impact of Response Time on Health Outcomes in Emergency Care Using Air Temperature as an IV

PRESENTER: **Thomas Pelloquin**
AUTHOR: Pauline Chauvin

This paper examines Response Time (RT) in emergency care, focusing on Large Vessel Occlusion (LVO), the most severe form of Acute Ischemic Stroke (AIS), which is a leading cause of disability and mortality, with EU strokes projected to increase by 34% by 2035. The best treatment for LVOs (Mechanical Thrombectomy) is rare and geographically limited, highlighting the challenge of balancing centralized efficiency with timely access for acute conditions. However, linking RT to outcomes is difficult due to endogeneity from severity biases and truncated data, such as patient and emergency services responsiveness, and hospital access.

Healthcare production is not only time-dependent but also varies greatly between individuals; this heterogeneity arises from unobserved or endogenous variables, particularly the severity of the condition, the rate of health depreciation or patient health literacy. This paper leverages original large-scale individual data, containing precise time measures for 15,467 episodes of acute ischaemic strokes (AIS), starting at symptom onset, as well as precise data on patient health outcomes -transformed into a utility index-, to address this complex relationship over the complete response time segment.

By choosing an original instrument —air temperature— in a non-parametric estimation, we identify the average treatment effect (ATE) of an increase in response time, as well as the average treatment effect on the treated (ATT). Furthermore, the heterogeneity in patients' returns to reducing response time is examined. Comparing the estimates of the relationship identified using an IV method with existing results in the clinical literature highlights the value of a robust identification strategy in correcting for effects' underestimation. Our approach suggests a near-linear relationship between delays and outcomes, challenging the conventional view of bounded effects in the management of AIS. Our ATT results support existing clinical recommendations, but policy-relevant treatment effects require a more precise account of patient benefits' distribution and health loss valuations.

Ind-1908 Combining Satellite Data and Causal Machine Learning to Evaluate Brazil s Family Health Programme in Slums

PRESENTER: **Ivan Ochoa-Moreno**
AUTHORS: Akseer Hussain, Marc Suhrcke, Rodrigo Moreno-Serra, Julia Hatamyar

Background: More than 2 billion people worldwide live in informal urban settlements (slums). This study examines the effects of primary health care provided through the Family Health Strategy (ESF) in Brazil, given geographic and environmental variations in the characteristics of Brazilian slums. *Methods:* We explore the potential of satellite data to provide high-resolution spatial information on slum areas as a complement to traditional survey methods and economic indicators. Using this approach combined with double-robust machine learning of municipal-level treatment effects, our aim is to understand the heterogeneity of slum conditions – spatial and socioeconomic – and their impact on population health with a focus on healthcare interventions, specifically the Family Health Strategy and its relationship to non-communicable diseases (NCDs). *Findings:* Within municipalities, we find significant differences across a variety of health-related satellite data measures between slum and non-slum areas; for example, slums are hotter, more humid, and have poorer air quality than their surrounding areas. These environmental qualities influence the ability of the ESF to reduce NCD-related mortality: municipalities with more polluted slums experience less overall reduction in respiratory and cardiovascular mortality. *Conclusions:* These and other findings may inform targeted interventions and policies to address the unique health challenges faced by favela residents, ultimately working to reduce health disparities in urban Brazil.

1:30 PM –3:00 PM TUESDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Bali

Innovative Approaches for Eliciting Health Preferences in Vulnerable Groups

MODERATOR: **Robin Blythe**,

Ind-1226 Using a By Children For Children Approach to Improve Understanding and Engagement in Choice Experiments Carried Out With Children and Young People.

PRESENTER: **Lazaros Andronis**, University of Warwick
AUTHORS: Alison Pearce, Mr. Stavros Petrou, Cameron Morgan, Cam Donaldson, Emily Lancsar

Background Choice experiments are commonly employed to elicit the preferences of members of the public including, increasingly, children and young people (CYP). Emerging empirical evidence shows that older children are generally able to provide valid answers to elicitation experiments. However, a key prerequisite is that such exercises are designed appropriately, in a way that maximises understanding and engagement. **Aims** The overarching aim of this work is to identify and test ways of enhancing the understanding of and engagement with preference elicitation experiments carried out with CYP. **Methods** This work is being carried out in close collaboration with a publicly funded group of CYP in the UK (NIHR Young Research Champions), using as a vehicle an ongoing project that employs choice experiments to tease out the (monetary) value CYP put on their time. The first part of this (ongoing) work involves conducting focus group meetings during which participants (aged 8 to 18 years old) are (i) prompted to think about what understanding and engagement means to them in the context of preference elicitation exercises and, (ii) encouraged to work together to come up with strategies and 'understanding-boosted' versions of choice experiments, designed 'by children, for children'. Next, enhancements will be incorporated into the choice experiment instruments which will be subsequently tested in a series of concurrent 'think aloud' interviews. These will be conducted with a separate group of CYP, as part of the pre-testing stage of the choice experiments, with explicit feedback sought on understanding, engagement and potential improvements. Following each think aloud interview, the interviewer will also be debriefed about their perceptions of the respondents understanding and engagement. **Findings** To date, focus group sessions have offered insights into conceptualising understanding and engagement, and have given rise to various ideas about ways of enhancing choice experiments for CYP. These include suggestions about a coherent narrative that connects different parts of the experiments, short 'explainer' videos, pop-up information balloons, and built-in games). Next steps will involve embedding this input into experiments and pre-testing them with potential respondents, with findings expected in May 2025. This work and its findings will be useful in highlighting a participatory approach to designing choice experiments in CYP, as well as in pinpointing specific design characteristics that could make choice experiments more attractive to young respondents, fostering participation and improving data quality.

Ind-209 Do Child Age And Parental Status Matter in Valuing The Child Health Utility 9D (CHU9D)?

PRESENTER: **Xiuqin Xiong**
AUTHORS: Natalie Carvalho, Li Huang, Kim Dalziel, Nancy Devlin

Objectives Current value sets for child health typically only apply to children > 5 years, yet many interventions target younger children. There is mixed evidence about whether preferences for health vary by child age, most focusing on older age groups. There is also a lack of consensus about whose preferences should be obtained. Value sets are often based on preferences of the adult general public, but parents have more experience of child health. The objectives of this study are to test whether preferences for children's health states differ (a) when considering those aged 2-4 years compared to older children and (b) by parental status. Dependent on our findings from above we also aim (c) to generate a value set(s) for the CHU9D that can be applied to children from 2 years of age upwards. Methods Health states were described using the Child Health Utility 9D (CHU9D). A discrete choice experiment (DCE) survey was administered between September 2023 and March 2024 to a representative sample of the Australian general adult population which included a 20% quota of parents of 0–18-year-old children. Participants were randomly allocated to two study arms: considering the health of a 2–4-year-old or a 10-year-old child. A conditional logit model was used to obtain the latent values from the choice responses. The differences in latent values between the two ages and between parents and non-parents were analyzed using relative attribute importance (RAI), poolability test, and pooled model with interaction terms. Visual Analogue Scale (VAS) responses were used to anchor the latent values onto a 0-1 utility scale. Results 3112 participants were included. Results suggested that the preferences between the two age perspectives were similar, with only 1 out of 36 interaction terms significant. Parents' preferences differed from those of non-parents, as indicated by 3 significant interaction terms and failure in poolability test, having smaller disutility for severe health states in *pain, tired* and *join in activities* dimensions. Two value sets based on the general adult population's preferences and parents' preferences respectively were generated and compared, with slightly higher values for the value set derived from parents' preferences in severe health states of dimensions such as *tired* and *sleep*. Conclusion Considering CHU9D health states in 2–4-year-olds compared to 10-year-olds did not affect adults' preferences, although preferences differed between parents compared to non-parents. Two value sets derived from the general adult population and parents are reported.

Ind-383 Improving Digital Neurorehabilitation: Exploring Patient Preferences and Subgroup Variations

PRESENTER: **Ann-Kathrin Fischer**
AUTHORS: Andrew Sadler, Thomas Kohlmann, Dr. Axel Christian Mühlbacher

Background: Stroke is a leading cause of disability globally, driving demand for neurorehabilitation services. Digital technologies presented an opportunity to improve rehabilitation outcomes and address workforce shortages. However, patient acceptance is vital for the success of these innovations, as uptake rates depended on patients' perceived value and specific preferences. While digital technologies had been increasingly used, research had not sufficiently explored the nuances of patient preferences and subgroup-specific patterns. Identifying and understanding individuals is essential for optimizing patient engagement and promoting sustainable implementation. Previous studies had identified acceptance factors for digital innovations but lacked a detailed analysis of how preferences varied across patient subgroups. This study addressed this gap by systematically assessing factors that influenced patient acceptance, recognizing preference heterogeneity, and characterizing distinct subgroups within the patient population.

Objectives The study had three main objectives: 1) To determine the relative importance of different attributes and mean preferences for digital neurorehabilitation. 2) To derive acceptance probabilities for various digital solutions within the neurorehabilitation context. 3) To examine

preference heterogeneity through subgroup analysis.

Methods A discrete choice experiment (DCE) was conducted in 2021 with 165 stroke survivors (experimental group), and 1,094 participants from the general population (control group) focusing on seven attributes: (1) explanation and presentation of therapy exercises, (2) information provided during therapy, (3) contact with healthcare professionals, (4) patient choice in the therapy process, (5) data processing, (6) monthly copayment and (7) therapy success within six months. A fractional-factorial design was used. Initial mixed logit (MXL) analysis revealed substantial standard deviations in several attributes, indicating heterogeneity in patient preferences. This prompted further latent class analysis (LCA) to identify distinct subgroups.

Results: The MXL model showed that therapy success and copayment were primary determinants of acceptance, with technical aspects such as patient choice and information provision also playing a significant role. Three alternative digital technologies were modeled to illustrate how acceptance probabilities, ranging from 44% to 84%, varied according to changes in technical aspects. LCA identified three distinct preference classes. Class 1 (21.3%) was characterized as cost-sensitive, with a strong preference for lower copayments (ß80€ = -3.355, p > 0.001; ß0€ = 3.058, p > 0.001). Class 2 (32.2%) was outcome-oriented, prioritizing high therapy success rates (ß60% = -4.035, p > 0.001; ß100% = 3.909, p > 0.001). Class 3 (46.4%) was technology-focused, emphasizing the importance of healthcare professional contact (ßdirect = 0.941, p > 0.001) while also valuing self-determined location flexibility (ßplace = 0.632, p > 0.001) and feedback on individual progress during therapy (ßchange = 0.433, p > 0.001). These classes reflected dimensions of technology acceptance. Class 2 aligned with perceived usefulness, while class 3 emphasized perceived ease of use, underscoring the need for both technical and therapeutic benefits to drive patient engagement.

Conclusions: This study highlighted the importance of considering diverse patient preferences in digital neurorehabilitation. Acceptance was shaped by factors like cost, therapy success, and user-centered technical design. Tailoring digital interventions to subgroup preferences could enhance engagement, support more effective neurorehabilitation, and contribute to sustainable practice improvements.

Ind-994 Preferences For Accessing Pre-exposure Prophylaxis Among Men Who Have Sex in Australia; a Discrete Choice Experiment

PRESENTER: **Warittha Tieosapjaroen**
AUTHORS: Jason J. Ong, Edwina Wright, Nittaya Phanuphak, Curtis Chan, Doug Fraser, Benjamin R. Bavinton, Lei Zhang, Vincent Cornelisse, Heather-Marie Schmidt

Background:

PrEP usage remains below the national 75% coverage target. This study examined PrEP choice drivers, predictors of uptake for different program models, and identified subgroups with similar preferences among MSM in Australia.

Method:

MSM aged** >18 years with no prior HIV diagnosis and residing in Australia completed an online discrete choice experiment (DCE) between May and November 2022. They were recruited through dating apps and local MSM community organisations. We used random parameters logit (RPL) models to estimate each attribute's relative importance and predict PrEP uptake for varied program configurations. A latent class model (LCM) was used to explore sub-groups with similar preferences for PrEP programs.

Result:

Overall, 1,892 MSM participated, with a mean age of 40 (±12.7) years. Cost was the most important driver of PrEP program choice, followed by the type of PrEP, side effects, extra sexually transmitted infection (STI) testing, location and visit frequency. The least preferred PrEP program, which resulted in 48% predicted uptake, consisted of a cost of AU$100, a removable PrEP implant with potential rare kidney problems, and access to PrEP via hospital every two months without STI testing. Our model predicted that the uptake could increase up to 100% with the most preferred PrEP program, which included free long-acting oral PrEP with no side effects, accessing PrEP via a pharmacy annually, and including STI testing. The LCM identified four groups of MSM: "Long-acting oral or injectable PrEP from STI clinics" (22%), "Daily oral PrEP from pharmacy" (5%), "Long-acting oral PrEP from pharmacy" (52%), and "injectable PrEP from the hospital" (22%).

Conclusion:

There is a growing demand for alternatives to oral daily PrEP, with the majority of MSM in Australia preferring long-acting oral or injectable PrEP. Decentralising access of PrEP through pharmacies was also preferred by the majority.

1:30 PM –3:00 PM TUESDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Executive Room 2

Screening, Diagnosis, and Specialized Care

MODERATOR: **Christian Abraham Arega**,

Ind-1733 Healthcare-Seeking and Cost of Cancer in Kidney Transplant Recipients: A Difference-in-Differences Analysis Using Korean Administrative Claims Data

PRESENTER: **Yunji Choi**
AUTHORS: Eunjeong Kang, Hojoon Sohn, Juwon Hong, Hajeong Lee, Taewook Kang, Subin Jeong, Hyeonho Shin, Jeongin Song, Minsung Sohn

Background: Kidney transplant (KT) patients are subject to lifetime immunosuppressants, which is associated with an increased risk of cancer. Furthermore, with recent advancements in immunosuppressants, the average age of patients receiving kidney transplants has increased, which may result in higher cancer incidence and disease burden among KT patients. Improving our understanding on the patterns of healthcare use and costs post cancer diagnosis for KT patients will facilitate the design of cancer screening and care policies for this important patient group.

Objectives: We assessed the cancer treatment choices and associated costs of KT patients by exploring the differences in patterns of cancer treatment and healthcare use relative to the comparator groups: cancer patients from the end-stage kidney disease (ESKD) and the general population (GP). First, we examined whether KT patients face limitations in cancer treatment choices. Second, we investigated whether cancer diagnosis and treatment decisions have any persistent effects on cancer-specific and overall healthcare costs.

Methods: We used the Korean National Health Insurance (KNHI) claims data to identify a sub-cohort of cancer patients from those who received kidney transplant (KT), and two comparator groups. Using propensity-score matching (PSM), we constructed two different samples: (1) 1,308 KT cancer patients and a matched sample of 3,611 GP cancer patients using year of cancer diagnosis, gender, age group, socioeconomic status, and year-month of death as matching variables; (2) 1,276 KT cancer patients and a matched 2,583 ESKD cancer patients using the same matching variables plus duration of dialysis. We assessed a difference-in-differences (DD) estimates for KT cancer patients, separately for each of the two control groups, with the first date of cancer treatment defined as an event time.

Key results: Relative to GP cancer patients, KT cancer patients had 10.5% and 10.4% lower rate of chemo- and radiation therapy utilization, resulting in an average of 2.3 million KRW (approximately 1,600 USD) 5-year cumulative cancer treatment per-patient costs. However, KT patients had higher cumulative cancer treatment costs – 2.3 million KRW higher – relative to cancer-ESKD patients. Conditional on getting treated with either chemotherapy, radiation therapy or surgical procedure, the 5-year cumulative expenditure on cancer treatment increased compared to both GP and ESKD patients. The difference in monthly medical cost or number of physician visits narrowed within the first six months, largely because cancer diagnosis led to a slight decrease in overall spending for KT patients and an increase in overall spending for GP patients. Notably, KT patients exhibited reduced healthcare costs on kidney failure or hypertension.

Conclusions: Our real-world data showed that KT patients had limited cancer treatment choices compared to choices relative to those offered to the general cancer patients. Nevertheless, once the cancer treatment is initiated, the expenditure incurred on cancer treatment was larger for KT patients. Our findings suggest that the experience of kidney transplant itself may already have served as a significant health shock, thereby resulting in no notable change in care-seeking pattern of KT patients after cancer diagnosis relative to both comparator groups.

Ind-1918 Defining a Target Product Profile for [99mTc]Tc-sestaMIBI SPECT/CT in Kidney Tumor Diagnosis using DCE: Trading Certainty for Lower Risk

PRESENTER: **Siyabonga Ndwandwe**, Clinton Health Access Initiative (CHAI)
AUTHORS: William F Wildgoose, Ms. Rachael Hunter, Hannah Warren, Geraldine Fox, Maxine Tran

Background:

Over 13,000 people are diagnosed with kidney cancer annually in the UK, often by chance. Conventional imaging methods struggle to differentiate between cancerous and non-cancerous kidney tumours—up to 30% kidney tumours are non-cancerous. Currently diagnosis depends on histology from surgery or biopsy, both of which are invasive procedures with risk of complications. The [99mTc]Tc-sestaMIBI SPECT/CT (MIBI) nuclear scan has shown high diagnostic accuracy for benign tumours and there is interest in utilising this test within the UK's National Health System (NHS). However, limited research exists on patient and public preferences for this scan.

Aim: We developed a discrete choice experiment (DCE) to identify preferences for key diagnostic features and developed a target profile favouring the scan over surgical resection

Methods:

An initial list of attributes related to cancer diagnostics was identified from literature; and narrowed down to 20 then 5 items through discussion and a focus group of eight patient representatives. Appropriate attribute levels were assigned, and choice sets optimised using the D-efficiency approach, which minimised parameter estimates' variance-covariance matrix with non-informative priors. A three-part online survey was distributed nationally to members of the public through a third-party. Respondents ranked the five attributes by order of importance then completed 10 choice-tasks each with two test options. Conditional logit models quantified attributes' impact on utility and willingness to give up test certainty depicted trade-offs. Minimal and optimal criteria were defined for test attributes that could satisfy >80% and >90% of respondents as an alternative to surgery.

Results:

Of the 150 responses received, 35% (n=53) had prior experience of cancer tests, 87% (n=130) were white, 68% (n= 102) female. The risk of serious complication was ranked as the most important attribute and had the greatest impact on utility (coefficient = -2.17). Pain/discomfort

from the test was ranked lowest. No significant difference was detected between respondents younger than 55 years vs 55 years and older or between those who have tested for possible cancer and those without prior test experience. Respondents were willing to trade 32% diagnostic for 1% improvement in complication risk. To be preferred over surgery, a MIBI scan with 75% specificity, 0.75% probability of a serious complication, mild pain or discomfort and 30% of patients needing additional tests would require a minimum sensitivity of 70% and optimal sensitivity >79%. However, if the risk of serious complications was reduced to 0.3% instead of 0.75%, the minimally and optimally acceptable sensitivity for the test would decrease to 55% and 65% respectively.

Conclusions:

This study presents strong evidence for patients trading off kidney cancer diagnostic certainty to avoid the risk of complications, which is a key value-proposition for the MIBI scan. It is non-invasive whilst histology from surgery and biopsy surgery are invasive. Furthermore, our analyses highlight key consideration for future test development and patient-centred decision making in cancer diagnostics with the NHS. These findings are further strengthened by the response homogeneity, particularly by age and prior experience with cancer diagnostic tests.

Ind-305 Does Parenthood Affect Cancer Screening? Exploring the Influence of Child Age and Sex in Hepatocellular Carcinoma Screening

PRESENTER: **I-Hua Chen**
AUTHOR: Li-Lin Liang

Does Parenthood Affect Cancer Screening? Exploring the Influence of Child Age and Sex in Hepatocellular Carcinoma Screening

Background

Hepatocellular carcinoma (HCC) ranks as the second leading cause of cancer deaths in Taiwan in 2023. Biannual abdominal ultrasounds are recommended for patients with chronic hepatitis B (CHB) or C (CHC) to promote early detection. While factors such as socioeconomic status (SES), age, sex, and geographic location influence HCC screening, the impact of parental status is less understood. This study investigates whether having children, and specifically the age and sex of the youngest child, influences parental HCC screening rates.

Methods

Data were sourced from the National Health Insurance Research Database (NHIRD) and the Maternal and Child Health Database in Taiwan. We identified a cohort of 387,779 patients (52% male, 48% female) diagnosed with CHB between 2010 and 2014, with follow-up from 2015 to 2022. Patients with prior cancer diagnoses, liver operations, missing data, or fewer than two follow-up records were excluded.

We employed a panel data fixed-effects Poisson model to examine the relationship between parental status and HCC screening uptake, controlling for individual time-invariant unobserved heterogeneity to reduce potential endogeneity. To explore sex-specific patterns, separate analyses for mothers and fathers were conducted. The primary predictors were the age and sex of the youngest child, with age categorized as 0, 1-3, 4-6, 7-12, 13-15, and 16-18 years. The reference group comprised individuals without children or with all children >18 years. Control variables included parental age, SES, medical history, child's medical history, and year indicators.

Results

Parental HCC screening behaviors varied by the age and sex of their children and differed between mothers and fathers. Mothers with the youngest child aged 0 and 1-3 years had significantly lower incidence rate ratios (IRRs) for HCC screening, at 0.791 (95% CI: 0.752–0.833, $p<0.001$) and 0.916 (95% CI: 0.878–0.955, $p<0.001$), respectively.

In contrast, fathers of young children showed no significant decline in screening rates. Notably, when their youngest child was a daughter aged 4–12 years, fathers exhibited a modestly higher IRR compared with those whose youngest child was a son, whereas among mothers, screening rates did not differ by child sex.

Conclusions

Caring for young children imposes a substantial barrier to HCC screening among mothers but not fathers, reflecting a trade-off in family health capital investment. In contrast, fathers of daughters aged four to twelve demonstrate slightly higher screening uptake, suggesting a "daughter effect" that merits further investigation. These findings highlight the importance of developing policies to support parental responsibilities and promote cancer screening, especially among mothers.

Ind-2345 Willingness to Pay for a Novel Malaria Diagnostic in Five Countries in Sub-Saharan Africa

PRESENTER: **Bryony Simmons**
AUTHORS: Elisa Sicuri, Lesong Conteh

Background: The value individuals place on new diagnostic tools is important for understanding demand and guiding their adoption and integration into healthcare systems. This study investigates the willingness to pay (WTP) for a new malaria diagnostic tool across five endemic African countries: Burkina Faso, Ethiopia, Kenya, Namibia, and Sudan. The study explores individual-level determinants and potential biases in WTP valuation.

Methods: Data were collected from 2,274 participants. In four countries, respondents were individuals (or their caregivers) presenting at health facilities with fever indicated for malaria testing, while in Namibia, interviews were conducted in the community. WTP was elicited using two

stated preference elicitation methods: a bidding game format and open-ended valuation. Trivariate probit models estimated unbiased WTP while adjusting for covariates such as age, gender, symptoms, malaria test results, and risk perception. A subset of participants in Burkina Faso (n=424) participated in a follow-up assessment with modified WTP designs one week after the initial evaluation.

Results: Overall, 94% of participants were willing to pay for the diagnostic tool. WTP varied across settings, ranging from USD 0.8 in Namibia to USD 5.5 in Ethiopia (maximum WTP from open-ended response). The trivariate probit analysis estimated an average unbiased WTP of USD 0.8 (SD 0.07). Prior payment for diagnostic tests for any illness was associated with higher WTP in all settings except in Kenya. In Namibia, risk perception significantly influenced WTP, with higher levels of perceived risk correlating with increased valuations. In the Burkina Faso sub-study, follow-up assessments with modified WTP designs resulted in higher WTP compared to baseline, potentially suggesting the presence of anchoring bias.

Conclusion: The findings underscore the importance of contextual factors, such as prior diagnostic expenditure and perceived risk, in shaping WTP for malaria diagnostics. Biases in elicitation methods, particularly anchoring effects, underscore the need for robust study designs. These results offer valuable insights into the market potential for malaria diagnostics and could inform cost-effectiveness thresholds for new diagnostic tools in resource-constrained settings.

1:30 PM –3:00 PM TUESDAY [Health Beyond The Health System]

Bali International Convention Centre – Singaraja

Pandemic Impacts

MODERATOR: **Mehdi Ammi**, Carleton University

Ind-1967 The Impact of H5N1 on US Domestic and International Dairy Markets

PRESENTER: **Prof. Katharina Hauck, PhD**, Imperial College London
AUTHORS: Joseph Hicks, Giovanni Forchini, Guillaume Morel, Anh Pham, Christian Morgenstern, Thomas Rawson, John Edmunds, Victoria Fan, ScD

The recent outbreak of H5N1 avian influenza in U.S. dairy cattle poses significant health and economic risks. Dairy cattle have not been identified as a host for the H5N1 virus previously, and the scale and duration of the outbreak means the risk of the emergence of a human-adapted strain is intensifying. Each time an infection occurs the virus could mutate into one that excels in transmitting between other mammals, and eventually humans.

Vigilant testing and monitoring of cattle and enhanced biosecurity practices are paramount to preventing further spread of H5N1 in the USA, and globally. Despite government subsidies, farmers are reluctant to introduce improved biosecurity measures. But failure to contain the outbreak now may result in higher costs for the industry later. Importantly, the costs of containing the outbreak now are small when contrasted against the uncertain but potentially catastrophic health and economic costs of the emergence of a H5N1 variant that is transmissible between humans.5

We use a Computable General Equilibrium model is used to assess the short-to-medium term macro-economic impact of the H5N1 outbreak amongst dairy cattle to the US economy and its key trading partners. Disruptions to the dairy sector would be expected to have ripple effects to the broader US economy, and globally. We estimate the impact of the current outbreak (Scenario S1), and of two hypothetical but plausible scenarios S2 and S3 under more stringent interventions and reductions in domestic and international demand for US milk, milk products, and beef. The magnitudes of the shocks differ by scenario and are informed by estimates of the impacts of Bovine spongiform encephalopathy (BSE) in the 1980s and 90s, and the H1N1 pandemic in 2009 on the livestock sector in the US. The H5N1 outbreak and public health measures are modelled as four exogenous shocks: Demand, supply, and international trade shocks, and subsidies to farmers.

We project that the short- to midterm loss associated with the current H5N1 outbreak is about $13.7bn in the US (based on 2023 GDP) or 0.05% of GDP. Should the US fail to contain the current outbreak, we project that the economic loss to the USA may vary between $54.7bn (0.2%, for realistic scenario S2) and $164.2bn (0.6%, for reasonable worst-case scenario S3). We evaluate the macro-economic impacts on prices, exports, outputs and employment in the agricultural and other sectors of the US, and further impact on household incomes, investments and savings. We also evaluate impacts on key trading partners Mexico, Canada, and Australasia, but find they are small.

We estimate that the current subsidies for enhanced testing and biosecurity (estimated at $98m) are covering about than 1% of the projected aggregate output loss of the dairy, cattle, and raw milk sector due to the outbreak. The currently introduced measures are disproportionately lax given the scale of the potential impact of the emergence of highly virulent H5N1 strains with pandemic potential into human populations.

Ind-2096 Association of Severe COVID-19 and Persistent COVID-19 Symptoms with Food Insecurity Among US Families with Children

PRESENTER: **Nicole L Hair**, University of South Carolina
AUTHOR: Carly J Urban

There is accumulating evidence that patients with severe COVID-19 and post-COVID-19 conditions face considerable economic consequences. In addition, prior work focused on the experiences of families, shows that families headed by an adult who had severe

COVID-19 or who was experiencing persistent COVID-19 symptoms (Long COVID) had greater odds of reporting a family member who was laid off or furloughed, lost earnings, or had any financial difficulties compared with similar families with no history of COVID-19. The economic consequences may be even more pronounced among low-income and economically vulnerable families with children; however, research focused on this population is relatively limited.

To this end, we use data from the Panel Study of Income Dynamics (PSID), a long-running, nationally representative household panel survey with interview conducted before and during the COVID-19 pandemic, to examine associations between severe or persistent COVID-19 symptoms and food insecurity in US families with children. Our sample comprised a balanced panel of families with resident children who were active in the PSID in both 2019 and 2021 (n=2268). The food security status of each sample family was measured using the USDA Household Food Security Survey Module. The COVID-19 exposure of each family was defined using information on COVID-19 diagnoses and symptoms reported for the family's reference person and, if present, their spouse/partner. Following prior work, families headed by an adult with a history of COVID-19 were assigned to ordinal exposure categories based on the duration and severity of reported COVID-19 symptoms. Families with no history of COVID-19 were assigned to a reference group. Leveraging the longitudinal structure of the PSID, logistic regression models adjusted for a range of potentially confounding characteristics, including indicators of economic hardship (e.g., food security status) measured prior to the pandemic.

Compared to families with no history of COVID-19, families headed by an adult with severe or persistent COVID-19 symptoms had a close to two-fold greater odds (1.75; 95%CI: 1.02, 3.01]) of experiencing food insecurity during the pandemic. In contrast, associations between moderate, mild, or asymptomatic COVID-19 and food insecurity were not statistically significant (0.75; 95%CI: 0.39, 1.44]). Associations between severe or persistent COVID-19 symptoms and food insecurity were strongest for families with lower income before the pandemic (e.g., pre-pandemic income below 200% of the federal poverty level).

We report greater odds of food insecurity among US families with children affected by COVID-19 symptoms despite increases to Supplemental Nutrition Assistance Program (SNAP) benefits during the pandemic. Given the prevalence of Long COVID (an estimated 17 million US adults had Long COVID in March 2024) and the lasting impact of food insecurity on children, policy actions to mitigate the economic consequences of post-COVID-19 conditions (e.g., expanded paid sick leave, improved workplace accommodations, and wider access to disability insurance) merit continued discussion.

Ind-2294 Beyond Numbers: Investigating the Impact of COVID-19 on Suicide Rates in Austria Using Regression Discontinuity in Time and Interrupted Time Series

PRESENTER: **David Roesler**

Introduction: TDuring the global COVID-19 pandemic, mental health faces substantial challenges. Although initial phases may have seen increased social cohesion potentially mitigating suicide risk, limited studies exist on the enduring effects. This study aims to comprehensively examine the impact of the pandemic on suicide rates, considering variations by gender, region and age, with a focus on Austria until December 2021. Existing research on the impact of the pandemic on suicidal behaviour provides valuable insights but does not yet allow to draw conclusions for Austria. Factors such as lockdown measures may influence suicide rates by affecting mental health conditions, altering the choice of suicide methods, diminishing help-seeking behaviours, or compromising the quality of medical care for individuals with mental disorders. In addition, this study employs a novel approach by incorporating regression discontinuity in time analysis. Unlike traditional interrupted time series analyses commonly used in previous research, this method allows for a more nuanced exploration of the temporal effects surrounding the implementation and lifting of specific pandemic-related measures. **Methods:** Utilizing real time monthly death records from January 2015 to December 2021, this study employs a regression discontinuity in time design and an interrupted time series analysis. Harmonic Fourier terms are incorporated to adjust for seasonal variations and a scaling adjustment was used to correct for overdispersion. **Results:** This study reveals a significant negative trend in Austria's suicide rates preceding the COVID-19 pandemic, coupled with an almost negligible rate change during the pandemic's onset. Notably, there were unexpectedly higher instances of suicides in Austria, indicating a deceleration in the decline of suicide numbers rather than an active increase. The study highlights the diverse impact across demographic groups, showcasing distinct trends in suicide rates based on gender, age, and regions within the same country. Particularly noteworthy is the pronounced negative effect observed among men aged 64-85, while women in the age groups 00-19, 20-34, and 65-84 experienced a small yet significant negative impact. Conversely, women in the age group 35-64 exhibited a positive impact. **Conclusion:** This study contributes to the understanding of the impact of the COVID-19 pandemic on suicide rates in Austria. The findings reveal a complex landscape of suicide trends, with higher-than-expected mortality in the pandemic period. Understanding these nuances is crucial for suicide prevention and policy decisions regarding improving health system resilience.

Ind-2439 Neighborhood Structural Racism and Its Effects on Individuals With Diabetes During the COVID-19 Public Health Emergency

PRESENTER: **Cydney M McGuire**

AUTHORS: Kosali Simon, Sih-Ting Cai

Poorly managed diabetes can lead to patients visiting the emergency department (ED) for conditions like diabetic foot ulcers (DFUs). When not properly treated, DFUs can lead to lower extremity amputation or death.1 Diabetes disproportionately impacts people from minoritized racial groups and many DFU patients face socioeconomic disadvantages posing challenges for managing their condition that exacerbate health complications. Patients with diabetes who present in the ED are highly complicated cases that may require in-person care; thus, these patients may be particularly vulnerable to disruptions in the in-person health care environment.

During the COVID-19 public health emergency (PHE), racially minoritized communities experienced greater than usual disparities in access to healthcare resources. For those living with diabetes, the impact of the PHE on access to health care could increase the likelihood of adverse health outcomes. Structural racism is one of the key drivers of inequitable access to health care. Access to health care services for patients with poorly managed diabetes may vary by neighborhood-level structural racism. The impact of COVID-19 disruptions was likely worse in

neighborhoods with higher indicators of structural racism.

The purpose of this study is to investigate the impact of the COVID-19 PHE on care in diabetes-related emergency department utilization, with particular attention to neighborhood-level structural racism and racial/ethnic disparities in access to care.

We use Medicare data from 2019-2020 and construct a cohort of individuals with diabetes who visited the emergency department. We merge this database with information on structural racism across 9 domains, estimated using census tract–level American Community Survey data. These data are compiled to produce a single summary score variable - The Structural Racism Effect Index (SREI).2

We employ a difference-in-differences design to evaluate the impact of COVID-19 PHE on Medicare beneficiaries with diabetes across neighborhoods with different structural racism scores. We identified a cohort of individuals with diabetes who visited ED in the first quarter of 2019 and followed their outcomes through the fourth quarters of 2020. The key dependent variables are DFU-related hospitalizations and mortality, and the key independent variable is the SREI summary score, which classified neighborhoods into high and low structural racism groups. We hypothesize that individuals with diabetes in high structural racism neighborhoods would experience worse health outcomes during the COVID-19 shock compared to those living in neighborhoods with low structural racism scores. We examine differences in outcomes across racial groups. We examine differences in care outcomes across those with different insurance types including Medicare Advantage, Fee-for-Service, and dual enrollment in Medicare and Medicaid.

In our preliminary analysis, we identified a total of 20,511,889 ED visits, with 38.5% involving Medicare beneficiaries diagnosed with diabetes. To ensure a complete follow-up period, we restricted our sample to those who were in the Medicare claims records in the first quarter of 2019, which included 866,754 unique Medicare beneficiaries with a diabetes diagnosis. On average, these patients had 21 diagnoses listed per ED visit. Additionally, 25% were enrolled in both Medicare and Medicaid, and they exhibited a high two-year mortality rate of 35%.

Ind-2755 The Health and Economic Impact of COVID-19 Misinformation in the United States

PRESENTER: **Sachiko Ozawa**, University of North Carolina at Chapel Hill
AUTHORS: Ashley Yi-Fang Lee, Colleen Higgins, Hui-Han Chen

Background: Misinformation is a defining issue of our times and an urgent societal concern that affects us all. Misinformation poses a significant threat to public health, contributing to preventable illnesses, deaths, and economic burden. During the COVID-19 pandemic, vaccine misinformation led to widespread vaccine hesitancy in the United States, significantly undermining vaccination efforts. This study quantifies the impact of misinformation on vaccine hesitancy, COVID-19 cases, hospitalizations, deaths, and associated costs in 2021.

Methods: A microsimulation model was developed to estimate the effects of vaccine misinformation on COVID-19 outcomes, tracking vaccinations, cases, hospitalizations, deaths, and costs across states and age groups. Vaccine hesitancy due to misinformation was modeled using age- and state-specific data, with probabilities for infection and severity differing by vaccination status. Counterfactual scenarios removed misinformation, showing increased vaccination rates and reduced hospitalizations, deaths, and associated healthcare costs. The model incorporated real-world constraints such as vaccination capacity and validated outputs against observed data. Costs were analyzed at both state and national levels, with per-person costs calculated for states with the highest burden.

Results: Vaccine misinformation in 2021 was associated with approximately 2.3 million COVID-19 cases, 66,000 hospitalizations, and 45,000 preventable deaths. Misinformation about COVID-19 vaccines cost the United States $2 Billion from hospitalizations in 2021. State-specific costs of misinformation were significant, with the highest total costs observed in California ($229 million), Texas ($173 million), Florida ($171 million), New York ($144 million), and Pennsylvania ($107 million). When adjusted for population, the highest per-person costs were found in Montana, Nevada, Colorado, Arizona, Wyoming, New Mexico, and Alaska, with an estimated $10–$14 per person in excess costs due to misinformation.

Conclusions: Misinformation about COVID-19 vaccines in 2021 led to substantial public health and economic consequences, with millions of preventable cases, tens of thousands of avoidable deaths, and billions in added healthcare costs. While the COVID-19 pandemic has waned, misinformation remains a pervasive issue with the potential to undermine future public health efforts. Comprehensive strategies to combat misinformation, rebuild trust in science, and promote evidence-based communication are critical to safeguarding population health and minimizing societal costs.

1:30 PM –3:00 PM TUESDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Surabaya

Quantifying Disease Burden Across Global Contexts

MODERATOR: **Julienne Lechuga**, University of Bologna

Ind-817 The Impact of Adult Obesity on Household Catastrophic Healthcare Expenditures

PRESENTER: **Peizhe Yan**
AUTHORS: Jialong Tan, Jian Wang

In China, obesity has emerged as a significant public health issue, imposing a substantial healthcare burden at both national and individual levels. This study aims to explore the impact of obesity on household healthcare expenses and the underlying reasons.

We examined and quantified the effect of individual obesity on household healthcare burden using data from the China Family Panel Studies (CFPS) from 2010 to 2020, encompassing 11,177 participants. To address endogeneity, we employed an Instrumental Variable Probit model, using the weight level of biological children as an instrumental variable. The children's weight levels were determined based on the sex- and age-specific growth charts provided by the World Health Organization. The household healthcare burden was assessed by measuring the risk of catastrophic medical expenditures.

The baseline regression results indicate that obese individuals are significantly more likely to incur catastrophic medical expenditures within their households compared to non-obese individuals. Additionally, the mechanism analysis revealed no significant differences in healthcare resource utilization or overall healthcare expenditures between obese individuals and their counterparts. However, obese individuals experienced notable income reductions, including decreases in both total annual income and wage income, at both the household and individual levels. This study argues that this significant income reduction is the primary reason for the increased probability of catastrophic medical expenditures in households with obese individuals.

Heterogeneity analysis further showed that obesity presents an increased risk of catastrophic medical expenditures across various subgroups, including gender, education, urban-rural residency, and health status. Men, individuals with lower education levels, and those in poorer health were more affected than their respective counterparts. Notably, only obese individuals in low-income groups faced a significantly higher risk of catastrophic medical expenditures, whereas high-income groups were largely unaffected. The findings remain robust when the sample size is expanded, alternative methods and thresholds for measuring catastrophic medical expenditures in households are applied, and individual-level expenditure controls are included.

This paper concludes that securing income stability is crucial to reducing the incidence of catastrophic medical expenditures among households with obese individuals. The findings suggest that income inequality, rather than additional medical expenses, is the primary driver of the higher healthcare burden for households with chronic disease patients. Future research should focus on addressing productivity loss due to chronic diseases and labor market inequalities to mitigate household healthcare burdens.

Ind-913 The Global, Regional, and National Burden of CKD and its Risk Factor: an Analysis of the Global Burden of Disease Study 2021 and Forecast to 2035

PRESENTER: **Jingyu Wen**
AUTHORS: Yuhang LI, Yifu Hou, Min Li

Background

Chronic Kidney Disease (CKD) poses a significant challenge to global healthcare systems, impacting patient health and highlighting issues related to socioeconomic development, healthcare accessibility, and efficiency. Prior research has been limited to specific age groups and regions, lacking a comprehensive global perspective. This study presents global, regional, and national disability-adjusted life years (DALYs) data for CKD from 1990 to 2021, emphasizing health inequality. By predicting the CKD burden in 2035, we aim to guide future medical resource allocation and health policy planning, focusing on high-burden populations and reducing disease burden.

Method

Using data from the Global Burden of Disease Study 2021, this study systematically evaluated the global, regional, and national burden of CKD and their changes. Age-standardised incidence rate (ASIR), age-standardised mortality rate (ASMR), age-standardised rate of DALYs (ASDR), and burden due to risk factors associated with CKD was analyzed. Geographical variations, the impact of the Sociodemographic Index (SDI), and trends in ASIR, ASMR, and ASDR were assessed using regression analysis and stratification by SDI quintiles. Risk factors attributable to CKD were estimated using the comparative risk assessment framework of the GBD study, and the Bayesian age-period-cohort (BAPC) model predicted future disease burden trends.

Result

In 2021, the global incidence of CKD was 19,935,037, with 1,527,638 deaths and 44,453,683 DALYs. The highest ASIR, ASMR and ASDR were observed in the middle-SDI quintile regions in 2021, Africa and Mauritius had the highest mortality rates and ASMR. From 1990 to 2021, ASIR, ASMR, and ASDR for CKD increased globally, with some regional decreases. Males had a higher burden than females, except the AAPC of ASIR (males (AAPC, 1.257(-[1.244 to 1.271]) and females (AAPC, 1.427[1.417 to 1.438])). Risk factors included Kidney dysfunction, Metabolic risks and High fasting plasma glucose with variations across SDI regions. BAPC model predictions suggested that the burden of CKD will continue to increase in the future, especially in terms of the number of new cases.

Conclusions

CKD remains a formidable public health challenge, with its burden rising consistently since 1990. This trend not only mirrors the intricate challenges confronting global health landscapes but also underscores the persistence of healthcare disparities, particularly acute in economically less developed countries and regions. Even more alarming, projections indicate a continued increase in CKD burden until 2035, exacerbating global public health pressures. Urgent attention is needed for public health interventions in less developed nations, optimizing resource allocation, enhancing infrastructure, and upgrading medical services. Deepening health education and elevating public awareness and self-management are crucial to reduce CKD incidence and progression risks.

Ind-1015 Economic Burden of Pneumonia and Invasive Pneumococcal Disease in Fiji

PRESENTER: **Fulgence Niyibitegeka**

AUTHORS: Laila Sauduadua, Fiona M Russell, Petueli Veremalumu, Natalie Carvalho, Rachel Devi, Tupou Ratou, Litiana Volavola, Ilisapeci Vereti, Stephanie Clark

Background ` `Despite progress over the past decade through pneumococcal conjugate vaccine (PCV) introduction, pneumonia remains one of the major causes of health facility-based consultations in Fiji.** Understanding the societal costs (health system plus household costs) associated with pneumonia and invasive pneumococcal diseases (IPD) can guide health strategy priorities and budget allocation and is essential for evaluating the cost-effectiveness of interventions to address this health problem. This study aimed to estimate household and health system costs associated with clinical pneumonia in children under five years, and health system cost of laboratory-confirmed IPD in all-age groups in the Fijian population. **Methods** We conducted a prospective cost-of-illness study from December 2023 to June 2024 at one tertiary hospital and two primary health facilities in Fiji. The health system cost of IPD was estimated through a retrospective review of medical records from 2013 to 2019, prior to the disruption of data entry accuracy caused by the COVID-19 pandemic. Household costs of pneumonia included all direct medical expenses (medicines, diagnostic tests, and other medical supplies and equipment), direct non-medical expenses (travel, meal, accommodation, additional communication) and indirect cost in terms of productivity lost due to absence from work by household members to take care of their children. The health system cost for both pneumonia and IPD included direct medical costs for medications, investigation tests, medical supplies and equipment, and bed days for hospitalised patients or visits costs for outpatient **Results** For the prospective study, we collected data on a total of 382 pneumonia patients under five years of age, of which 141 patients were hospitalised with an average hospital stay of 9 days. The retrospective review included a total of 66 IPD cases of which 20 patients were under-five with average hospital stay of 17 days. The household cost of outpatient pneumonia was estimated at US$120 and US$92 at heath centre and hospital level, respectively. The health system cost of outpatient pneumonia was estimated at US$13 and US$105 at heath centre and hospital level, respectively. The resulting societal cost was estimated at US$133 and US$196 for outpatient pneumonia at health centre and hospital, respectively. For inpatient pneumonia, the societal cost was estimated at US$959 consisting of US$134 in household cost and US$825 in health system cost. The health system cost for IPD was estimated at US$1,425 in children under five and US$1,189 in patients over five years. **Conclusion** Pneumonia and IPD impose a substantial economic burden to the Fijian society particularly for hospitalised episodes of which the per patient cost accounts for over 15% of Fijian gross domestic product per capita (US$5,868). The evidence from this study provides relevant estimates that can inform cost-effectiveness analysis of interventions to reduce the burden of pneumonia and IPD in Fiji.

Ind-1041 Health and Economic Burden of Disability in Bangladesh: Insights From the National Perspective

PRESENTER: **Raisul Akram**

AUTHORS: Arjan Buis, Jeremy Lauer, Alec Morton

Background: Disability became a substantial global challenge, significantly affecting social participation and economic productivity. This issue is particularly pronounced in low- and middle-income countries (LMICs) like Bangladesh. Despite the high prevalence of disability within the population, national-level insights into the health and economic burden of disability in Bangladesh are scarce, leading to the unknown need and hindering efforts to improve national initiatives on improving preventive, curative and rehabilitation services. **Aim**: This study aims to estimate the health and economic burden of disability in Bangladesh, highlighting disability prevalence, types, severity, excess healthcare costs, and the incidence of Catastrophic Health Expenditure (CHE). **Method**: This quantitative research analysed nationally representative cross-sectional data from the 2022 Household Income and Expenditure Survey (HIES) of Bangladesh. Disabilities were assessed by identifying functional difficulties in vision, hearing, mobility, cognition, self-care, and communication among 60,653 participants from 13,931 households. Disability status was determined through self-reported assessments using the Washington Group's Short Set of Questions. The incidence of catastrophic health expenditure (CHE) was defined as household healthcare costs exceeding 40% of their non-food expenditure. **Results**: National disability prevalence was estimated at 5.7% (CI: 5.48-5.85), with 4.19% reporting "some difficulty", 1.36% "severe difficulty", and 0.16% being "fully disabled". The most common disability prevalence was recorded for visual disability (2.96%, CI: 2.87-3.13), followed by mobility (2.42%, CI: 2.22-2.45), cognition (1.81%, CI: 1.65-1.86), hearing (1.55%, CI: 1.51-1.71), self-care (1.54%, CI: 1.45-1.64), and the lowest for communication-related disabilities (1.4%, CI: 1.31-1.5). Prevalence was higher among females (5.4%), rural residents (5.9%), the elderly (27.9%), among participants suffering from chronic illnesses (12.6%), and was inversely related to asset quintiles. Multiple disabilities were present in 2.44% of the population, with visual and hearing impairments frequently co-occurring (1.16%). Households with any disabled member reported higher healthcare expenditures compared to those without (37% vs. 27% of non-food expenditures) and experienced a higher incidence of CHE (15% vs. 9.6%). The primary coping strategy differed by income level: low-income households mainly relied on donations (42.7%), while higher-income households primarily used their savings (43.1%). **Conclusion**: The study highlights a higher prevalence of disabilities among specific demographic groups in Bangladesh, with the overall burden remaining higher than in many other neighbouring LMICs. Additionally, our analysis underscores the heightened vulnerability of poorer populations to disabilities, highlighting broader socioeconomic disparities. High rates of visual, mobility, cognitive, and hearing disabilities emphasise the need for extending preventive, curative and rehabilitation services and government interventions prioritising vulnerable groups within the country. The financial strain on affected households calls for expanding social safety nets and subsidies for assistive services to improve health status and reduce healthcare disparities.

Ind-1133 Persistent Inequalities in All-Cause Mortality in Taiwan: A Comprehensive Analysis of Trends and Contributing Factors (2000 2022)

PRESENTER: **Jia Wen Tay**

AUTHOR: Li-Lin Liang

Introduction

Despite Taiwan’s universal health coverage, socioeconomic health inequalities persist. All-cause mortality is a critical indicator for assessing such inequalities as it reflects overall population health, but has not been extensively studied. This study examines the trends and determinants of inequalities in all-cause mortality between 2000 and 2022, and is the first to apply the concentration index and its decomposition to Taiwanese data.

Methods

Age-standardised all-cause mortality rates (ASMRs, annual deaths per 100,000 people) were analyzed for 349 townships and stratified across five income quintiles. Joinpoint analysis was adopted to estimate the trends over 23 years till 2022. Annual percent change (APC) was calculated to evaluate the rate of change in ASMRs. Inequality in ASMRs was quantified using the concentration index (CI), decomposed by factors such as sex, socioeconomic status (annual household income, education), population density, physician supply, healthcare accessibility (travel time to the nearest academic medical centre, regional hospital, and clinic) and employment measures (non-working population, population in agriculture and construction). CI decompositions were performed for 2010, 2019 and 2022. Data sources included Taiwan Ministries of Health and Welfare, Interior and Finance.

Results

From 2000 to 2022, ASMRs were consistently higher in the poorest quintile (490.54 to 711.74) compared to the wealthiest (388.06 to 530.51), with an average ASMR ratio of 1.32:1. The ASMR for the poorest quintile decreases to a level comparable to the wealthiest quintile after approximately 13 years. Pre-COVID-19 (2000-2019), ASMRs declined across all quintiles, with the steepest decrease in the poorest quintile (average APC: -1.88%) compared to the wealthiest (-1.64%), narrowing their ASMR gap from 161.59 to 102.49. During COVID-19 (2020-2022), ASMRs increased across all quintiles, but only the increase in the wealthiest quintile was statistically significant (APC: 4.28%).

CIs revealed persistent pro-poor patterns (-0.076 to -0.060, $p<0.001$). Inequalities in household income, education, and travel time to regional hospitals were the largest contributors to ASMR inequality. Between 2010 and 2022, income inequality's contribution decreased (36.7% to 23.2%), education's contribution rose (23.3% to 28.1%), and the ranking for contribution of regional hospital accessibility fluctuated, increasing during the COVID-19 pandemic (30.1%, 24.3%, 28.3%).

Conclusions and Policy Implications

This study highlights persistent disparities in all-cause mortality rates across income quintiles. While differences between the poorest and wealthiest quintiles decreased over time, ASMRs in the poorest quintile remained significantly higher, underscoring the need for targeted efforts to address the root causes of health disparities.

The findings reveal the growing importance of educational inequality as a driver of ASMR inequality, hence policymakers should prioritize improving educational opportunities and outcomes in poorer townships. Additionally, the changing contribution of healthcare accessibility during the COVID-19 pandemic emphasizes the critical role of regional hospitals and proximity to healthcare resources in ensuring equitable health outcomes. Investments in telemedicine and other innovative healthcare delivery models could address accessibility gaps in underserved regions.

This study demonstrates that addressing income inequality alone is insufficient. A multifaceted, holistic and dynamic approach that integrates efforts to improve education, healthcare accessibility and broader socioeconomic determinants is essential for reducing mortality inequalities.

1:30 PM –3:00 PM TUESDAY [Health Care Financing & Expenditures]

os129 Bali International Convention Centre – Magnolia

Provider Payment Mechanisms and Their Impact on Quality of Care and Clinical Practices: Comparative Insights from Low- and Middle-Income Countries

MODERATOR: **Timothy Powell-Jackson**, London School of Hygiene and Tropical Medicine, LSHTM

CONVENER: **Peter Binyaruka**, Ifakara Health Institute (IHI)

DISCUSSANT: **Anne Mills**, London School of Hygiene & Tropical Medicine

abs-os185 Blending Capitation with Performance Pay: Can It Improve Quality in Chronic Care?

PRESENTER: **Ms. Inke Mathauer**, World Health Organization (WHO)
AUTHORS: Yunguo Liu, Anja Smith, Qian Long, Megumi Rosenberg, Luca Lorenzoni, Stevie Nappoe, Sarah Barber

Background: Addressing the enormous burden of premature mortality from non-communicable diseases (NCDs) requires improving the quality of care for patients with chronic conditions. Enhancing chronic care quality is also crucial for advancing progress toward universal health coverage (UHC). Purchasing arrangements, as a key component of health financing, serve as vital policy instruments to support quality improvements. Many countries are shifting toward blended payment systems, in which a portion of payments is linked to quality targets related to care processes or patient outcomes. Capitation is often selected as the base payment model. This paper examines country reforms that combine capitation payments with performance pay and assesses their institutional design features, impact on care quality, and areas of weakness in design and implementation.

Methods: This paper synthesizes evidence from four countries (Chile, China, Indonesia, and South Africa). Country experts employed a structured data collection instrument to explore the design, implementation, and effects of these payment models based on publicly available information and key informant interviews. The authors conducted data analysis and synthesis, complemented by a scoping literature review to

consolidate the available evidence.

Results: Across all countries, the incentives in these programs were found to be insufficient to drive significant changes in provider behavior necessary for improving chronic care quality or patient outcomes. Both design and implementation challenges contributed to underperformance. For example, providers faced uncertainty regarding payment timing and amounts; payment arrangements designed as penalties for inadequate performance were less effective compared to reward-based models; and voluntary participation by both patients and providers weakened the programs' overall impact.

Conclusion: In all cases, performance payment arrangements were part of broader strategies aimed at improving chronic care quality. This underscores the importance of aligning and embedding payment mechanisms within a comprehensive framework of quality improvement measures. The study also highlights the need for adjusting performance payments based on patient health risk and case complexity to avoid "cream skimming" by providers who may prefer lower-risk patients. Moreover, setting progressive and context-sensitive quality targets, rather than fixed uniform targets, may lead to higher acceptance and effectiveness among healthcare providers. As more countries adopt such payment models, rigorous evaluation must be established to assess the effects of these arrangements, fostering cross-country learning and informing future reforms.

abs-os193 Examining the Effect of Provider Payment Mechanisms on Healthcare Quality and Equity in Tanzania

PRESENTER: **Peter Binyaruka**, Ifakara Health Institute
AUTHORS: Timothy Powell-Jackson, John Joseph Maiba, Josephine Borghi, Francis Ngadaya, Gemini Mtei

Background: Strategic healthcare purchasing, including well-designed provider payment mechanisms (PPMs), is crucial for achieving universal health coverage (UHC). Each PPM creates different incentives, influencing provider behavior and impacting healthcare delivery in intended or unintended ways. As Tanzania prepares to implement mandatory universal health insurance (UHI), effective PPM design is essential to support strategic purchasing goals. However, little evidence exist on how different PPMs, such as fee-for-service or capitation, affect provider actions, service quality, and equity in care in low-income settings. This study aims to assess the impact of current PPMs in Tanzania to guide UHI design toward high-quality and equitable healthcare.

Methods: This study uses a mixed-methods design, collecting both quantitative and qualitative data. Quantitative data were gathered through client-exit surveys in 28 primary healthcare facilities across two regions, with at least 10 insured and uninsured clients per facility from outpatient and antenatal care department (n=280). We measured quality care indicators influenced by payment methods and provider behaviors such as waiting and consultation times, interpersonal care, content of antenatal care, drug prescription patterns, C-section rates, referral practices, health promotion advice, and out-of-pocket payments. Socioeconomic status of clients used to measure equity in quality distribution. Focus group discussions and in-depth interviews were conducted with insured and uninsured clients to explore patient-provider interactions, satisfaction, and overall care experiences. Quantitative data are analysed descriptively, using equity measures (gap, ratio and concentration index) to assess equity, propensity score matching and regression analysis to quantify PPM effects on quality of care by regressing quality outcomes against insurance status with fee-for-service and capitation method, while thematic content analysis to analyse qualitative data.

Results: We expect to observe quality-of-care differences between clients of various insurance schemes (different payment methods) and uninsured, with variations in key quality indicators such as waiting times, service scope, and out-of-pocket costs. Equity analysis will indicate how socioeconomic status impacts quality distribution, while regression analysis will quantify the effects of fee-for-service, capitation and out-of-pocket payment on care quality. Qualitative findings will provide further insights into patient-provider interactions and satisfaction, highlighting how PPMs shape overall care experiences.

Conclusion: Findings will shed light on the implications of PPMs on healthcare quality and equity in Tanzania, supporting evidence-based policy decisions for UHI-related PPM reforms. This will help optimize PPM designs to promote equitable and high-quality care, advancing a fairer and more efficient healthcare system in Tanzania.

abs-os194 Healthcare Variation in Three Public Health Insurance Schemes in Thailand

PRESENTER: **Woranan Witthayapipopsakul**
AUTHORS: Anne Mills, Jan Van Der Meulen, Ipek Gurol-Urganci, Orawan Anupraiwan, Pongsun Puntachai, Gumpanart Veerakul, Apichat Asavamongkolkul, Viroj Tangcharoensathien, Kanokwaroon Watananirun

Background: Variations in medical practice can be expected because patients have different health needs and preferences. However, variations may also occur because patient groups have different health insurance arrangements which can affect quality of care, equity in health, and financial burden on health systems and individuals. Thailand introduced its Universal Health Coverage policy in 2002 through multiple public health insurance schemes led to substantial enhancements in healthcare access and outcomes. This research compares healthcare utilisation and selected outcomes in specialised care settings across Thailand's three public health insurance schemes: Civil Servant Medical Benefit Scheme (CSMBS), Social Health Insurance (SHI), and Universal Coverage Scheme (UCS). While all schemes offer comprehensive benefits, differences exist in their eligibility criteria, treatment options, provider choices and access rules, cost-sharing policies, and provider payment methods including payment rates.

Methods: We used individual health records from national-level insurance claims data between 2015-2020 to explore variations in coronary revascularisation and mortality in 98,142 ST elevation myocardial infarction (STEMI) patients; caesarean section (CS) in 1,670,828 singleton deliveries; 147,697 women undergoing benign hysterectomy; and 39,198 older patients with primary osteoarthritis undergoing total knee arthroplasty (TKA) across different insurance schemes. Poisson regression models estimate procedure rates in the population, and generalised

linear models estimate absolute differences by insurance scheme.

Results: After adjusting for demographics, comorbidities, admission year, and health regions, significant differences in service utilisation across schemes were found. CSMBS-insured patients generally exhibited higher utilisation rates, followed by their counterparts in SHI and UCS. The variations were more pronounced in elective procedures compared to emergency and life-threatening services. Additionally, STEMI patients insured through CSMBS showed higher survival rates, followed by those insured through SHI, and then UCS.

Conclusion: Despite being insured, diverse health insurance arrangements, notably provider payment methods and rates, access rules, provider choices, and socioeconomic status contribute to variation in health care utilisation and outcome. CSMBS beneficiaries benefit from higher DRG payment rates, direct access to specialists and greater opportunity to bypass public hospital waiting lists, may also influence their higher utilisation rates. Policy recommendations include unification of public insurance schemes or harmonisation of specific insurance features. Our empirical evidence highlights the need to recognise the right to access quality health care regardless of socioeconomic status, and to advance policy discussions about health financing governance for a just health system.

1:30 PM –3:00 PM TUESDAY [Supply And Regulation Of Health Services And Products]

os157 Bali International Convention Centre – Executive Room 1

The Organization and Regulation of Medical Care in the United States

MODERATOR: **Melinda Buntin**, Johns Hopkins University, Carey Business School

CONVENER: **Jill Horwitz**, University of California, Los Angeles

DISCUSSANT: **David Cutler**, Harvard University

abs-os274 Initiation of Buprenorphine Following an Emergency Department Visit for Medicaid Enrollees with Opioid Use Disorder

PRESENTER: **Ms. Ellen Meara**
AUTHORS: David Fiellin, Arno Cai, Brianna Hardy, Jeremy Cygler

Despite recent reductions, over 100,000 U.S. residents died of drug overdose in 2023, and three quarters of these deaths involve opioids. Individuals participating in public insurance programs like Medicaid, which insures low-income and disabled populations, have higher rates of opioid use disorder (OUD) than the average adult. Randomized trial evidence supports the initiation of buprenorphine in the emergency department (ED) for people with diagnosed OUD. Initiation of buprenorphine in an ED increases retention in OUD treatment and reduces the quantity of illicit opioids used in the 30 days after an ED visit. Some hospitals have explicit programs or protocols to initiate buprenorphine or to make rapid referrals to treatment with buprenorphine, but receipt of buprenorphine remains rare. Furthermore, we understand little about the characteristics of hospitals doing more of this evidence-based care. The goal of this paper is to identify characteristics associated with induction of buprenorphine within 7 days of an ED visit for OUD or an opioid-involved overdose. We do three things: 1) characterize the variation in buprenorphine induction within 7 days of an emergency department visit for OUD across hospitals, 2) estimate how buprenorphine induction changes with characteristics of the index hospital (ownership, patient mix, participation in alternative payment models), market characteristics (distance to opioid treatment program, local buprenorphine prescribers per population), and Medicaid policies (i.e. expansion state, participation in a Medicaid Accountable Care Organization contract).

To study the characteristics of hospitals where patients visit the ED for OUD, we examine 111,257 ED visits among 100,443 unique Medicaid enrollees aged 18 years and older, without evidence of medication for OUD in the prior 30 days treated at 550 hospitals reimbursed by Medicaid programs in seven U.S. states (Connecticut, Kentucky, Massachusetts, Michigan, Ohio, South Carolina, and Tennessee). Data on care before, during, and after ED visits come from the Medicaid Transformed Analytic Files from 2017 to 2019. States selected had relatively high rates of OUD and opioid-involved overdose and high documented data quality. The percent of patients with evidence of buprenorphine induction within 7 days of an index ED visit was low for every hospital studied, but it varied widely by hospital both across and within states (from near zero to nearly 5 percent). Across states, the lowest rate of 7-day buprenorphine induction was in Michigan (under one percent), and the highest was in Ohio (4.5 percent). In contrast, visits with a clinician were much more common (40 percent of patients discharged from one emergency department had a clinician visit within 7 days).

By linking Medicaid data to American Hospital Association survey data where these patients had an ED visit, we test the hypothesis that organizational characteristics of hospitals (participation in alternative payment models like Medicaid Accountable Care Organization contracts, and programs that integrate behavioral and physical health) and market characteristics (per population number of active buprenorphine prescribers) are correlated with higher rates of buprenorphine initiation within 7 days of an emergency department visit. These findings will identify features of high performing facilities treating patients with OUD.

abs-os607 Technology Regulation Reconsidered: The Effects of Certificate of Need Policies on the Quantity and Quality of Diagnostic Imaging

PRESENTER: **Ms. Carrie Colla**
AUTHORS: Austin Nichols, Anthony Yu, David Cutler, Jill Horwitz

Certificate of need (CON) laws are designed to control medical spending and improve quality of care by increasing volume per location. CON laws are in place in 35 U.S. states for some medical services. Estimates of the impact of CON laws on medical care have been inconsistent and have mainly focused on spending rather than quality, possibly because not all CON laws apply to all services. Identification of CON effects is difficult: CON implementation may be endogenous to state spending and it is impossible to control for all factors that can influence imaging trends. Using original datasets identifying imaging-related CON laws and each freestanding and hospital-based MRI and CT location in the U.S., we estimate the effects of CON on MRI and CT, using regression discontinuities to examine the variation at state borders in use, quality, and spending. We estimate the effects of state CON laws on the number of health care providers, where providers choose to locate, and the imaging care for Medicare fee-for-services beneficiaries. We use local regression with a triangle kernel, estimating facility placement with a 100 mile bandwidth and imaging receipt using 20 miles as the baseline bandwidth. Models for location of an imaging facility are estimated at the census tract level, and beneficiary receipt of imaging is estimated at the zip code level.

"Appropriate imaging" is measured as MRI or CT imaging with a diagnosis of trauma in the coincident set of billings. "Inappropriate imaging" draws on Choosing Wisely recommendations from physician specialty societies. Medicare beneficiaries in regulated states are slightly less likely to receive any image and considerably less likely to receive low-value imaging than beneficiaries in non-regulated states. We find a -1.4% reduction in the probability of MRI facility at the CON border (with approximately equal effect on hospital-based and freestanding units) and no significant difference in the probability of a CT facility at the CON border. We find a slight reduction in MRI probability at border (0.3 percentage points, 2% of mean on non-CON side) and no change in use of CT. High-value imaging is either unaffected at the border. We find 20-26% reductions in receipt at the border for six low-value imaging services. Overall, CON reduces low value care and largely leaves high value care unaffected.

abs-os267 The Effects of Tort Immunity on Nursing Home Staffing, Treatment, and Outcomes

PRESENTER: **Jill Horwitz**
AUTHORS: Liang Li-Jung, Lee Jennings, Jose Escarce, David Zingmond, Neil Wenger

A central goal of tort law in the medical context is to protect quality of care by deterring negligent treatment. Although previous research has produced mixed results, much finds no association between liability exposure and either treatment or outcomes. During the COVID-19 pandemic, many states provided immunity from tort liability for harms to nursing home residents, creating a natural experiment for examining the effects of immunity on nursing home staffing, care delivery, and outcomes among a particularly vulnerable population. We tested the association between various forms of state tort immunity on nursing home liability and nursing home staffing patterns, care processes and resident health outcomes using measures derived from CMS Nursing Home Compare, Payroll Based Journal Daily Staffing Averages, and Weekly Nursing Home COVID-19 Tracking Data.

During the pandemic (spring 2020-present), roughly eighty percent of the U.S. states implemented some form of tort immunity for nursing homes covering different periods of time ranging from temporary to indefinite immunity. Nursing homes immune from tort liability exhibited fewer staff-patient contact minutes per day than nursing homes in states that did not grant tort immunity. Nursing homes in states that granted tort immunity also had lower quality scores on process measures such as vaccine administration, antipsychotic use, dependence in daily activities, and use of restraints among residents. Emergency department visits, hospitalizations, and COVID-19 cases were greater among residents in nursing homes in states with immunity.

Introduction of immunity was associated with decreased staff-patient time and staff qualifications, inferior care patterns, and worse health outcomes for nursing home residents.

abs-os658 The Impact of Physician-Hospital Integration on Cost and Quality of Oncology Care

PRESENTER: **Pragya Kakani**
AUTHORS: Gabriel Brooks, Alexi Wright, David Cutler, Nancy Keating, Ms. Mary Elizabeth Landrum, Mr. Michael E. Chernew, Nancy Beaulieu, Stacy Gray
Abstract: There has been considerable growth vertical integration between physicians and hospitals in recent years. However, relatively little is known about whether and how physician-hospital integration impacts care delivery. Understanding the impact of this phenomenon is especially important in oncology because oncology has been especially impacted by integration activity in recent years and because patients use many hospital-based services which may be impacted by integration. **Research Aim:** We evaluate the impact of physician-hospital integration in oncology on cost and quality of care. **Methods:** We perform this analysis using Medicare Fee-for-Service and Part D claims from 2010 to 2022 and a unique Health System and Practice Dataset, developed by National Bureau of Economic Research and Harvard University researchers, that tracks practice ownership relationships over time. We use stacked event study design to track outcomes for oncologists moving from independent practices to hospital-owned practices between 2012-2019, 3 years before and after the employment change. Oncologists are compared to a control group of oncologists in their local market who remain at independent practices. Quality outcomes include receipt of timely chemotherapy following surgery and end-of-life intensity of care measures. We also evaluate heterogeneity of results by hospital 340B eligibility. **Results:** We find that total spending associated with six-month chemotherapy episodes decreased by $880 (95% CI: [$433, $1326]) following an oncologists' transition to hospital-based employment. The most significant contributors to this decrease are decreases in spending on chemotherapy, imaging, tests, and radiation. While part of these reductions are related to lower prices paid to hospitals, particularly for infused chemotherapies, other decreases are unrelated to price. There were increases in spending on chemotherapy administration and office visit, due to site of service differences in Medicare prices at facilities. There were also increases in intensity of infused chemotherapy treatment, as estimated by the average sales price, particularly at 340B hospitals. We find no positive impact of physician-hospital integration on quality of care overall or at academic medical centers. **Conclusions:** We find that physician-hospital integration in oncology results in lower costs with heterogeneous effects by cost category but no improvements in quality. Thus our results suggest that claims of quality improvements and concerns regarding overuse associated with physician-hospital integration may be overstated.

Our results also support the continued movement towards site-neutral payments.

1:30 PM –3:00 PM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

os220 Bali International Convention Centre – Medan

Leveraging Economic Evidence to Improve and Sustain Immunization Program Performance in Low and Middle Income Countries

MODERATOR: **Alex Adjagba**, UNICEF Zimbabwe

CONVENER: **Brendan Kwesiga**, UNICEF

Ind-690 Multi-Criteria Decision Analysis for National Immunization Programs: the Development of a Rating and Priority-setting Tool for Policy Makers

PRESENTER: **Chao Gong**
AUTHORS: Li Yang, Jiawei Zhang

Introduction: As the number of vaccines recommended by the World Health Organization (WHO) and the proportion of the program financed by domestic resources grow, it is increasingly important for low- and middle-income countries (LMICs) like China to set context-specific priorities through an explicit, transparent, and accountable process. Decision-making in national immunization is a complex process involving a mix of epidemiological, economic and social-ethical value judgements. The application of Multi Criteria Decision Making (MCDA) could help policy makers choose the strategy that best meets all of these conflicting interests.

Methods: Through literature review and expert consultation with 18 experts, a Multi Criteria Decision Making (MCDA) framework was constructed to evaluate different vaccines that would be included in the national immunization program. Indicator weights were obtained using the analytic hierarchy process (AHP). Haemophilus influenzae type B (Hib) vaccine, pneumococcal conjugate vaccine (PCV), human papillomavirus (HPV) vaccine and rotavirus vaccine (RV), which have been recommended by the WHO but not included in China's national immunization program, as well as influenza and varicella vaccine, which were preferred by some regional or local areas, were compared using the score and rank according to the indicators and weights of MCDA framework. The indicator values of different vaccines were obtained from the researches conducted in the Chinese population, mainly the Global Burden of Disease study in 2019.

Results: 12 of 18 experts (66.7%) finished the two round Delphi survey finally, and a MCDA framework containing 5 first-level indicators and 13 second-level indicators was established, including disease burden (incidence, mortality, disability-adjusted life years), disease cost (direct disease cost, indirect disease cost), vaccine characteristics (effectiveness, safety, persistence, doses), vaccine cost effectiveness (price, cost-effectiveness) and coverage status (equity in coverage, inclusion in national immunization programs in different countries). The weights of disease burden, disease cost, vaccine characteristics, vaccine cost effectiveness and coverage status were 0.10, 0.14, 0.23, 0.28 and 0.24. The six vaccines, ranked from best to worst, were Hib, HPV, influenza, PCV, RV and varicella vaccine, for which the scores were 4.25, 4.15, 3.26, 3.23, 3.21, and 2.85, respectively.

Conclusions: The MCDA tool developed in this study could be used in the LMICs like China to prioritize the inclusion of different vaccination programs into the national immunization program, by soliciting opinions from various stakeholders, with attention to the disease burden, vaccine characteristics and coverage status. However, the indicators could be adapted to the context of different countries and regions. Continuous application and evaluation in different areas are needed to ensure the framework improves priority management and decision-making for immunization programs.

abs-os637 Enhancing the Use of Context Informed Economic Evidence in Vaccine Policy Making in Africa Countries

PRESENTER: **Jacob Kazungu**

As countries in Africa increasing move towards self-financing of their immunisation programs, there will be a need to strengthen evidence to support prioritization of new vaccines to be introduced but also optimization of the existing vaccine portfolios. This is essential in not only sustaining gains made with donor support but also ensuring the countries are better positioned to even introduce additional vaccines or switch within current vaccines using their own resources.

However, a key data gap with regards to use of economic evidence within the African context has been the absence of context specific quality-adjusted life year (QALY) value sets that will improve the validity of cost-effectiveness analysis of vaccines. A collaborative study is being implemented in Kenya, Zambia, and Nigeria to develop and use country specific QALY value sets to generate evidence and support its uptake. This study presents the approach to development and use of economic evidence to inform vaccine decision-making leveraging the implementation process in Kenya.

abs-os598 Estimation of the Cost for Delivering Hepatitis B Birth Dose in Ethiopia Using Facility-Based and Home-Based Vaccination Strategies

PRESENTER: **Brendan Kwesiga**
AUTHORS: Nelly Mejia, Elias Asfaw

Hepatitis B vaccination at birth prevents prevent mother-to-child transmission of hepatitis B virus (HBV) that causes chronic liver disease, including cirrhosis and liver cancer in adults. To optimize efficacy, the Hepatitis B birth dose (HepB BD) must be given within 24 hours of birth posing unique programmatic and operational considerations especially in settings that may have low facility-based delivery. These challenges could affect efficiency of delivery but also effectiveness of the vaccination program. Ethiopia implemented a pilot project of delivering HepB birth dose through home delivery arm to address the challenge of low facility delivery. Building on a pilot roll-out of HepB BD implemented 3 regions of Ethiopia (Addis Ababa, Amhara and Afar), this study estimated the incremental cost from a provider's perspective on the cost of delivering HepB BD vaccine to children born at health facilities and in homes. Estimates for the 2 study arms were estimated in urban, agrarian, and pastoral settings in Ethiopia. Sensitivity analysis was undertaken around approaches taken to estimate cost of human resources involved in delivery of the vaccine as this was the main cost driver influencing the cost of delivery for both study arms.

abs-os592 How Can Economic Evidence be Used to Inform Change in Age Eligibility for Routine Catch up Vaccination? Estimation of Cost of Policy Change in Uganda

PRESENTER: **Chrispus Mayora**
AUTHORS: Kirsten Ward, Brendan Kwesiga

Timely and complete vaccination is crucial for achieving population immunity against vaccine-preventable diseases and optimizing the benefits of vaccination. . Catch-up vaccination through routine vaccine delivery platforms (fixed, outreach, mobile, school-based) is integral to a well-functioning immunization program. As countries continue to recover from disruptions due to COVID-19 pandemic, the World Health Organization (WHO) has developed guidance on planning and implementing catch-up vaccination strategies through routine immunization. One of the limitations of implementing catch-up vaccination is age eligibility/permissibility, as some vaccines are not recommended beyond a certain age in some countries due to policy, administrative or financial/logistical constraints. Uganda has updated its age eligibility guidelines as part of the processes of updating its the Immunization in Practice Uganda (IIP) and zero-dose guidelines. This study assesses the incremental vaccine and non-vaccine related costs required to to catch up children aged 24-59 months who are missing vaccines on Uganda's national immunization schedule each year over from 2025 – 2030.

abs-os635 New Vaccine Introduction in the Context of Local Production: Cost-Effectiveness Analysis of PCV-13 Introduction in the Egypt

PRESENTER: **Alex Adjagba**

Middle-income countries (MICs), such as Egypt, that have not been eligible for Gavi support are lagging in introducing critical new vaccines. It has been shown that the pace of new vaccine introduction across MICs generally not as fast as in the self-sustaining high-income countries (HIC), or Gavi-eligible mostly low-income countries. One of the key vaccines that Egypt is yet introduce the pneumococcal conjugate vaccine that would be useful in addressing targeted pneumococcal diseases such as pneumonia, meningitis, and non-pneumonia non-meningitis (NPNM) infections.

Although the Egyptian government intends to introduce PCV-13, they have a preference to manufacture the vaccine serving the regional market in line with the African region aspirations of vaccine self-sufficiency. To generate evidence relevant to Egyptian policy makers, a cost effectiveness analysis for PCV-13 introduction was undertaken with scenarios to reflect the decision to introduce without domestic manufacturing and also consideration of scenario with domestic manufacturing. The 3 scenarios concerned were: (i)Immediate Introduction considering the use of vaccines with no local production, (ii) A delayed start after 5 years, considering introduction only once vaccine production is established (5 years)- with a phased vaccine production with technology transfers (form/fill/finish) and (iii) A delayed start at Year 10 considering introduction after domestic production.

This study uses various willingness-to-pay (WTP) thresholds across these different scenarios to demonstrate the extent of cost effectiveness and highlight the tradeoffs the policy makers would have to make for each choice made across the different scenarios under consideration.

1:30 PM –3:00 PM TUESDAY [Evaluation Of Policy, Programs And Health System Performance]

os222 Bali International Convention Centre – Denpasar A

Integrating Gender Analysis and Health Economics for Equity and Health System Strengthening

SESSION CHAIR: **Afsan Bhadelia**,

CONVENER: **Beverley Essue**, University of Toronto

DISCUSSANT: **Eeshani Kandpal**, The World Bank

abs-os634 Accounting for Gender in Economic Evaluations: A Scoping Review of Gender Outcomes and Impacts

PRESENTER: **Beverley Essue**, University of Toronto
Background: Economic evaluations are commonly used by health system planners to inform policy decisions on resource allocations. While gender disparities can impact health outcomes, access and experiences in health systems, gender-relevant outcomes are not routinely or

explicitly accounted for in many economic analyses and where accounted for, there is wide variation in the approaches and methods used and mixed evidence on their impact on resource allocation decisions. This scoping review seeks to examine how gender is integrated into economic evaluations of cancer interventions and to assess the impact of such integration on value assessment outcomes. Methods: This scoping review follows the framework outlined by Arksey and O'Malley (2005). A search strategy was developed with a medical librarian to identify studies that include explicit gender outcomes in recent economic evaluations of cancer care interventions. Three databases (PubMed, Medline, Embase) were searched for studies published in English from 2023 to present. Studies that assessed the cost-effectiveness, cost-utility, or cost-benefit of interventions from both health care and societal perspectives were included and assessed using a gender analysis framework. Data on the type of economic evaluation, costs and outcomes and the impact on value outcomes (e.g., incremental cost-effectiveness ratios) were abstracted from the included studies. Thematic analysis synthesized the findings, with a focus on methods, gaps in evidence, and variations across regions and cancer types. Results: Findings highlight variation in the extent to which gender is accounted for in the costs and outcomes included in economic evaluations of cancer interventions.Even with productivity and patient-time costs included, economic models remain gender-blind by failing to value unpaid caregiving and underestimating a breadth of societal benefits. While ICERs drop modestly, many studies remain unchanged or above WTP thresholds, obscuring interventions that may be cost-effective for women and potentially obscuring gender inequities. Significance: This review contributes to advancing interdisciplinary research on the intersection of gender and health economics. By mapping how gender is currently accounted for in cancer evaluations, the findings provide insights to strengthen health systems' gender responsiveness and promote health equity.

abs-os640 Assessing the Cost-Effectiveness of Universal Supplementation for ASHAs in Promoting Institutional Births in India

PRESENTER: **Sujata Mishra**, University of Toronto
AUTHORS: Beverley Essue, David Naimark

Background: India continues to face high maternal and neonatal mortality rates, particularly among socio-economically disadvantaged groups. The Accredited Social Health Activist (ASHA) program, the world’s largest community health worker initiative, aims to address these challenges by promoting maternal health. This study evaluates whether expanding state incentives for ASHAs can cost-effectively increase institutional deliveries across India, using a societal perspective. Methods: The study uses data from the National Family Health Survey (2019-2021), United Nations Population Estimates (2022), and Global Burden of Disease Study (2021). A logistic regression model estimates the odds of institutional births among women aged 18-49 in states with and without additional ASHA incentives. These odds ratios are converted to prevalence ratios to project increases in institutional deliveries. A microsimulation model will simulate a cohort of pregnant women to assess the impact of ASHA incentives on institutional deliveries. This model will incorporate detailed individual characteristics from the National Family Health Survey, such as age, education, wealth index, religion, caste, urban/rural residence, health insurance, and proximity to healthcare facilities. The simulation will predict changes in maternal behaviors and birth outcomes if state incentives for ASHAs is scaled nationally. Cost assessments include direct medical expenses (antenatal care, delivery costs, complications), non-medical costs (transportation), and ASHA-related expenses (training and incentives). Outcomes are measured through the Incremental Cost-Effectiveness Ratio (ICER), focusing on cost per additional institutional birth and per Disability-Adjusted Life Year (DALY) averted. Finally, sensitivity analyses will explore the robustness of results by adjusting key parameters, ensuring that conclusions remain valid across various assumptions and model calibrations. The study uses a societal perspective over a 44-week horizon. Results: The analysis shows that 88% of women in India delivered in healthcare institutions, though disparities persist across socio-economic and regional lines. While 64% of women used ASHA services, 57% resided in low-performing states like Bihar and Uttar Pradesh. Although 94% attended at least one antenatal care visit, only 54% completed four or more. Institutional births were more likely among women with higher education, health insurance, and adequate antenatal care. Conversely, lower socio-economic status, minority religions, and rural residency in Empowered Action Group (EAGA) states were associated with lower institutional delivery rates. The result of the cost-effectiveness of expanding state incentives for ASHAs, using a societal perspective currently underway. Conclusion: Expanding ASHA incentives offers an effective strategy to enhance institutional deliveries, especially in underserved regions, aligning with Sustainable Development Goals (SDGs) 3 (Good Health and Well-being) and 10 (Reduced Inequalities). By adopting a societal perspective and focusing on equitable healthcare access, the findings provide critical insights for policymakers in India and other countries leveraging community health worker programs. The results from this study can inform evidence that supports collaborative efforts under SDG 17 (Partnerships for the Goals) to optimize resource allocation and strengthen maternal health strategies globally.
Keywords*:* ASHAs, institutional delivery, community health worker, cost-effectiveness, markov

abs-os625 Balancing the Scales: Towards a More Objective Measure of Sex Inequalities in Health

PRESENTER: **Angela Chang**, Danish Institute for Advanced Study
AUTHORS: Ole F Norheim, Sarah Hawkes, David Watkins, Margaret Kruk, Felicia Knaul, Kent Buse, Emily K Johnson, Omar Karlsson, Sarah Bolongaita

Background: The answer to whether females or males have better health, and which sex is the more disadvantaged varies depending on whom you ask. This study introduces a new method for analyzing and interpreting sex inequalities in health outcomes – defined as the avoidable sex differences in health outcomes – that is systematic and potentially more objective. **Methods:** We introduce the adjusted sex ratio as a measure for sex inequalities and determining sex disadvantage. First, we calculated the sex ratio of life expectancy at ages 0, 5, 15, 35, 50, and 70. We identified sex-specific frontier countries with the highest 5% of life expectancy and estimated the sex ratio of the frontier. We calculated the country- and age-specific adjusted sex ratio by dividing the original by frontier sex ratios. This assumes that theoretically, under the current risk and healthcare environments, females all over the world have the potential to live up to the life expectancy of the females in the frontier countries, and separately, all males to their male-specific frontier. An adjusted ratio of greater than one indicates male disadvantage, while below one indicates female disadvantage. To focus on adjusted ratios which are unlikely to be due to noise, we set a buffer for each measure within which we do not classify disadvantage. **Findings:** Before adjustment, males in all countries (except two) and ages had lower life expectancy than females. After adjustment, between 13% (at age 0) and 33% (at age 70) of the 237 countries shift from male to female disadvantage in life expectancy. More than half of the countries remain male disadvantaged, indicating that males are generally disadvantaged

in terms of life expectancy in most countries, even after our adjustments. India and approximately half of the countries in the Middle East and North Africa, North Atlantic, sub-Saharan Africa, and Western Pacific and Southeast Asia show female disadvantage. The number of countries with female disadvantage rise with age, especially in sub-Saharan Africa and Western Pacific and Southeastern Asia. Central and Eastern Europe show substantial male disadvantage across nearly all ages even with adjustment. **Interpretation:** This study provides a novel, potentially more objective method for assessing sex inequalities in health outcomes, and presents the trends across countries, age, and time.

abs-os641 Gender and Workforce Planning: Accounting for the Value of Discrimination in Paid and Unpaid Health Work

PRESENTER: **Michelle McIssac**

Introduction: This session explores the economic and social impacts of gender discrimination in health and care work, both paid and unpaid, and discusses how these insights can inform more equitable health workforce planning. Drawing on two recent WHOs reports “Fair Share for Health and Care: Gender and the Undervaluation of Health and Care Work,” and “The gender pay gap in the health and care sector a global analysis in the time of COVID-19” we aim to explore the economic implications of gender discrimination in both paid and unpaid health and care work. Methods: We employ a comprehensive gender analysis framework to evaluate the extent and impact of gender discrimination in health work. This includes quantitative analysis of data on paid and unpaid health work, highlighting disparities and undervaluation. Gender pay gaps are explored using the Oaxaca-Blinder Decomposition (OBD) technique across for each of the 54 countries where data are available. And disparities in unpaid care work are explored in 41 countries where data are available. Conclusion: Our findings reveal significant undervaluation of women’s contributions to health, with substantial economic and social costs. Addressing gender discrimination in health and care work is not only a matter of equity but also essential for developing effective and sustainable health workforce policies and planning. By integrating gender analyses with conventional health labour market analyses, we can better understand the true value of health and care work and develop more equitable health workforce planning strategies. This session provides actionable insights and explores the policy levers to promote gender equality in both paid and unpaid health and care work References: “Fair Share for Health and Care: Gender and the Undervaluation of Health and Care Work,” World Health Organization, 2024. “The Gender Pay Gap in the Health and Care Sector: A Global Analysis,” World Health Organization, 2022.

1:30 PM –3:00 PM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

os70 Bali International Convention Centre – Frangipani

Adapting Economic Evaluations to Real-World Resource Allocation Practice: Recommendations for (R)Evolution

MODERATOR: **Chris Sampson**, Office of Health Economics (OHE)

CONVENER: **Matthew Franklin**, University of Sheffield

DISCUSSANT: **Jonathan Karnon**, Flinders University; **Angela Bate**, Northumbria University

abs-os73 Building a Robust Framework for Mental Health Investment in South Africa: Embedding Local Expertise, Feasibility, Efficiency and Stakeholder Ownership

PRESENTER: **Donela Besada**
AUTHORS: Sumaiyah Docrat, Crick Lund

Background. In South Africa, mental, neurological, and substance-use (MNS) conditions impose a substantial burden on the health system, with marked inequities in mental healthcare access. The National Health Insurance (NHI) was first proposed in 2011 as a means to promote equity in healthcare access towards universal health coverage (UHC). However, South Africa’s continued reliance on historical patterns of budget allocation maintains the status quo of sub-optimal and inequitable mental health resource use, highlighting the need for increased strategic priority setting and transparent decision-making processes. There is concern that unless mental health priorities are clearly incorporated into the policies and activities guiding NHI implementation, mental health may be overlooked. In response, the South African Mental Health Investment Case (MHIC) was commissioned by the National Department of Health and Treasury to guide resource allocation for mental health, emphasizing integrated community-based care, efficient service delivery, and a focus on both preventative and curative interventions.

Methods. The MHIC evaluated the return-on-investment (ROI) from scaling up interventions for anxiety, depression, psychosis, bipolar disorder, epilepsy, intellectual disability, child behavioural disorders, dementia, and substance-use disorders. The analysis utilized the WHO Inter-UN OneHealth Tool and an Excel-based model to project health benefits and estimate the total economic and social value over a 15-year period. The MHIC also incorporated a comprehensive stakeholder consultation process, a Delphi study for expert consensus, and considerations for programmatic enablers and infrastructural requirements.

Results. We found that the investment needed by the health department translates to 9% of the projected health budget expected by 2035. This is within international recommended norms of allocating 5-10% of the total health budget to mental health. Unaddressed MNS conditions represent an annual loss of 4% of the country’s GDP. Across all conditions, the estimated cost of mental health scale-up reflects just 11% of the economic value of lost productivity due to MNS conditions over the 15-year scale-up period. The investment case also demonstrates substantial returns on investment for several specific interventions. These include psychosocial interventions coupled with psychotropic medication for

adult depression and anxiety (RoI=4.0:1 and 1.5:1), social-emotional learning programmes for adolescents (RoI = 1.9:1), the identification and treatment of perinatal depression (RoI = 4.7:1), early prevention programmes for risky alcohol use (RoI= 1.2:1), and treatment of epilepsy through basic psychosocial support and antiepileptic medication (RoI = 1.8:1).

Conclusions. The MHIC highlights the critical need to address the growing burden of MNS conditions. It provides a robust framework for integrating mental health services into the NHI benefits package and emphasizes the economic rationale for investment. The comprehensive approach includes considerations for social determinants and cross-departmental costs, promoting collaborative planning and supporting economic recovery. The MHIC highlights best practices for ROI analysis by integrating key guiding principles. It fosters collective ownership with national and provincial health departments to enhance relevance and implementation potential, while valuing diverse local expertise to prioritize interventions across clinical, policy, and system levels. A focus on feasibility ensures realistic evaluations of programmatic and resource needs, and a commitment to data integrity leverages high-quality local evidence.

abs-os89 Health Prevention and Promotion Activities in Today's National Health Service: Further Challenges to the Cost-Effective Versus Affordable Conundrum

PRESENTER: **Ms. Rachael Hunter**, University College London
AUTHORS: Sarah Kalwarowsky, Rachael Frost, Cristina Avgerinou, Kate Walters, Claudia Cooper, Louise Marston, et al, on behalf of the HomeHealth Research Team, Pan Shengning, Andrew Clegg

Introduction. Health prevention and promotion initiatives are often promoted as being worth the investment given future cash-savings. This paper uses the findings of HomeHealth, a health promotion service for older adults with mild frailty, to examine how economic evaluation relates to local decision making.

Methods. The HomeHealth trial randomised 388 participants aged 65+ years with mild frailty to receive HomeHealth (195 participants) or treatment as usual (TAU; 193 participants). Health and social care resource use and carer time were self-completed at baseline, 6-months and 12-months. Primary and secondary health care resource use and medications were collected from patient files at 12-months post recruitment, covering the past 18-months. Stakeholders including local payers were consulted on the results of the trial and budget impact.

Results. At 12-months, participants allocated to HomeHealth had a significant reduction in emergency hospital admissions (IRR 0.65 95%CI 0.45 to 0.92) and unpaid carer hours at 6-months (-16 hours (95%CI -18 to -14 hours) or -£360 (95%CI -369 to -351) per patient). Although the HomeHealth intervention results in fewer emergency admissions, local payers struggle to identify the resources to fund it.

Discussion. This case study illustrates the problem with using standard economic evaluation methods to argue for implementation of health promotion and prevention initiatives in publicly financed healthcare systems. Although HomeHealth resulted in reduced emergency admissions and may be cost-saving to the system as a whole, it is not locally cash releasing. Health promotion initiatives are unlikely to be funded from local budgets without significant system wide changes. It is important to engage with stakeholders prior to designing and conducting an economic evaluation to ensure that the results meet their needs.

abs-os90 Is Economic Evaluation and Care Commissioning Focused on Achieving the Same Outcomes? Resource-Allocation Considerations and Challenges

PRESENTER: **Matthew Franklin**, University of Sheffield
AUTHORS: Sebastian Hinde, Ms. Rachael Hunter, Gerry Richardson, William Whittaker

Background. Commissioning describes the process of contracting appropriate care services to address pre-identified needs through pre-agreed payment structures. Outcomes-based commissioning (i.e., paying services for pre-agreed outcomes) shares a common goal with economic evaluation: achieving value for money for relevant outcomes (e.g., health) achieved from a finite budget.

Aim. We describe considerations and challenges as to the practical role of relevant outcomes for evaluation and commissioning, seeking to bridge a gap between economic evaluation evidence and care commissioning.

Methods. We describe conceptual (e.g., what are ‘relevant’ outcomes) alongside practical considerations (e.g., quantifying and using relevant endpoint or surrogate outcomes) and pertinent issues when linking outcomes to commissioning-based payment mechanisms, using England as a case study.

Key results. Economic evaluation often focuses on a single endpoint health-focused maximand, e.g., quality-adjusted life-years (QALYs), whereas commissioning often focuses on activity-based surrogate outcomes (e.g., health monitoring), as easier-to-measure key performance indicators that are more acceptable (e.g., by clinicians) and amenable to being linked with payment structures. However, payments linked to endpoint and/or surrogate outcomes can lead to market inefficiencies; for example, when surrogates do not have the intended causal effect on endpoint outcomes or when service activity focuses on only people who can achieve prespecified payment-linked outcomes.

Conclusions and implications for policy and practice. Accounting for and explaining direct links from commissioners’ payment structures to surrogate and then endpoint economic outcomes is a vital step to bridging a gap between economic evaluation approaches and commissioning. Decision-analytic models could aid this but they must be designed to account for relevant surrogate and endpoint outcomes, the payments assigned to such outcomes, and their interaction with the system commissioners purport to influence.

abs-os91 Mental Health Investment in Workplaces: A Study of Resource Allocation Practices in the UK

PRESENTER: **Mr. Hareth Al-Janabi**, University of Birmingham
AUTHORS: Yusuf Ozdemir, Yibei Qu, Luke Henstock

Background. Mental health problems are increasingly common in the workplace. Workplaces in the UK and many other countries are encouraged to invest in their employees' mental health, through interventions and cultural changes. There is a growing evidence base to support these investments, showing that many inventions are cost-effective. However, to date, little is known about how resource allocation for mental health and wellbeing works in workplaces in the real world, and, by extension, whether economic analysis might have to be adapted to inform decision-making in these settings.

Aim. To characterise decision-making processes, values, and evidence use in UK workplace settings and identify where this deviates from the rational, problem-solving, model.

Methods. In the *Wellbeing Investment in School and Employers* (WISE) study, we are using (i) process tracing with case study workplaces to study decision-making; (ii) think-aloud interviews with managers to study evidence use; and (iii) Q-methodology to understand values and attitudes to investment in workplaces. The initial findings from these empirical studies have been synthesised into a set of eight features of resource allocation practice.

Results. The features are: (i) diversity of decision-makers; (ii) conflicting objectives; (iii) workforce decisions; (iv) external search for resources; (v) contexts and constraints; (vi) practice wisdom; (vii) multiple sources of evidence; and (viii) varying evidence utilisation models.

Conclusion. The presentation will outline the 8 features and their implications for how health economics research is - and can be – best used workplace settings. The initial findings clearly point to important deviations in the real world from the implicit rational (problem solving) model underlying evidence production. To optimise the way that cost-effectiveness data and other research is used to support mental health investment, serious consideration needs to be given to tailoring and delivering analysis in different ways. This includes paying close attention to (i) identifying decision-makers and their goals and constraints prior to analysis; (ii) adapting analyses for varying contexts; (iii) engaging with different models of evidence use; and (iv) tackling decision problems related to time use.

1:30 PM –3:00 PM TUESDAY [Health, Its Valuation, Distribution And Economic Consequences]

os76 Bali International Convention Centre – Denpasar B

Challenges in Estimating Health State Preferences Relevant to Child Health over the Life Course

MODERATOR: **Myla Moretti**, The Hospital for Sick Children

CONVENER: **Wendy J Ungar**, The Hospital for Sick Children Research Institute

DISCUSSANT: **Julie Ratcliffe**, Flinders University

abs-os82 Assessing Preferences for Pediatric Health States from a Family Perspective

PRESENTER: **Wendy J Ungar**, The Hospital for Sick Children Research Institute/University of Toronto, Toronto, Canada
AUTHORS: Ramesh Lamsal, Carol Oliveira

Abstract

Background:. A key challenge to conducing CUA in infants and very young children is reaching consensus on the concept of health-related quality of life (HRQoL), part of which is understanding the effects on family members when a child is ill. Early work by Basu and Meltzer (2005) indicated that a patient's health state utility was a function of the direct effects of the health condition plus the effect of the patient's ill health on a caregiver's utility plus the effect of a caregiver's HRQoL on a patient's utility. This concept can be adapted to illustrate the dynamic HRQoL impacts within a family with an ill child. The maternal-fetal paradigm also warrants attention given that many costly screening, diagnostic, medical and surgical interventions are directed at pregnant women with health consequences for both the mother and the fetus or neonate that may be lifelong.

Objectives: To consider the construct of family HRQoL and to examine the range of approaches used to measure, integrate and report preference-weighted HRQoL effects in family members for pediatric and maternal-fetal CUA.

Methods: Qualitative thematic analysis was used to create a conceptual framework of HRQoL in families with an ill infant based on data from focus groups with caregivers and providers. Two separate systematic reviews were undertaken to identify pediatric CUAs and maternal-fetal CUAs that included preference-weighted HRQoL effects in family members. Data describing how these effects were measured, analysed, incorporated in the CUA, and reported, were extracted and categorized.

Results: Infant HRQoL was perceived as a unique entity strongly influenced by caregivers, family and the home environment. It may be inversely correlated with the degree of effort required to achieve normalcy in everyday life for the neonate/infant and its family. With regard to capturing family member preference-weighted HRQoL in pediatric CUA, 35 studies were reviewed. Most considered HRQoL effects on one family member. Eight different approaches for measuring preference-weighted HRQoL in family members were observed. Most commonly, QALY losses experienced by caregivers/parents were measured using an isolated approach whereby preference-weighted HRQoL impacts due

only to a child's illness was quantified separately from other health effects. The most common approach for integrating HRQoL effects in pediatric CUA was to sum children's and parent/caregivers' QALYs and report them from a family perspective. Among 54 QALY-based maternal-perinatal CUAs, 12 included fetal health outcomes, the impact of fetal loss on mothers' HRQoL, and the impact of neonatal demise on mothers' HRQoL. Most studies measured preference-weighted HRQoL impacts separately for pregnant women and offspring. The most common integration approach was to sum QALYs for pregnant women and children.

Conclusions: Neonatal/infant HRQOL is a multidimensional concept that considers a child's needs for healthy development in the context of the caregiver's ability to meet those needs. Wide methodologic heterogeneity in incorporating family member preference-weight HRQoL in pediatric and maternal-fetal CUA reflects the need for a theoretical framework and practical guidance to promote more rigorous evidence to inform decision-makers on the cost-effectiveness of health interventions aimed at pregnant women, neonates and children.

abs-os84 Transitions in the Measurement and Valuation of Health-related Quality of Life Across Age-specific Instruments: Challenges for QALY Estimation

PRESENTER: **Nancy Devlin**, University of Melbourne

Abstract

Background: Relevant aspects of Health-related Quality of Life (HRQoL) may differ by age. This has led to developing age-appropriate HRQoL instruments. These have the potential to improve HRQoL measurement *within* the target age range, at the (potential) cost of reduced comparability *between* age groups. The availability of age-specific instruments has in turn led to the development of preference weights to accompany them. Differences between the methods used to value pediatric and adult HRQoL have the potential to generate values with different properties. Differences in description and valuation of HRQoL using age-specific instruments will compound when used to estimate QALYs.

Objectives: Evidence is presented from two studies undertaken to investigate: (a) differences between HRQoL observed using age-specific instruments and (b) the characteristics of preference weights for them. The research focuses on two conceptually related instruments: the EQ-5D-5L and the EQ-5D-Y, which share broadly the same five dimensions, with differences in wording that reflect adaptations made to the latter. Research questions are: (a) do the EQ-5D-5L and EQ-5D-Y-5L generate similar *descriptions* of HRQoL? (b) Are the characteristics of value sets for EQ-5D-5L similar or different from the values for the EQ-5D-Y-3L? (c) What are the implications of these findings for estimating and comparing QALY gains between age groups?

Methods: The Y-5L and 5L were administered to n=691 12-18 years olds. Differences between self-reported health on each were examined and psychometric performance compared in terms of acceptability, feasibility, ceiling effects, convergence, test–retest reliability, and known-group validity. Value sets for the Y-3L and 5L were compared in all countries where both exist. Comparisons focused on length of value scale, % states valued < 0 and relative importance of dimensions.

Key results: Both Y-5L and 5L had good psychometric properties; responses to the instruments were strongly correlated. Ceiling effects were lower for the Y-5L than 5L; the Y-5L identified a higher incidence of self-reported HRQoL problems than 5L both overall and particularly in mental health.

There are substantial differences between the value sets for the 5L and the Y-3L. The Y-3L value sets tend to have a higher minimum value and fewer values < 0. Dimension importance differs: Pain/Discomfort is nearly always the most important dimension in Y-3L value sets, and 'functional dimensions' (Self-Care, Usual Activities, Mobility) are less important in Y-3L value sets compared to their adult counterparts.

Conclusions and implications: 5L and Y-5L are conceptually related and produce correlated but somewhat different conclusions e.g. 'worried, sad or unhappy' (Y-5L) leads to a greater prevalence of mental health issues being reported than 'anxious/depressed' (5L). There are also substantial and systematic differences between the value sets for the 5L and the Y-3L.

Implications for economic evaluation depend on how these differences play out when combined and used to identify changes in HRQoL; differences in values may counteract or amplify differences in observed HRQoL. Given that many childhood interventions generate QALYs in both childhood and adulthood, identifying differences between age-specific tools, and finding ways to address the transition across age-specific tools, is important.

abs-os80 Valuing Health-related Quality of Life of Children Less than Five Years of Age: Challenges and Results from Think Aloud and Valuation Studies

PRESENTER: **Kim Dalziel**, The University of Melbourne
AUTHORS: Nancy Devlin, Xiuqin Xiong, Alexander van Heusden

Abstract

Background: The burden of disease within childhood is highest in children under 5 years of age. This is the age group where we see the greatest concentration of health service use and health technology assessment linked to activities such as vaccinations, newborn screening and genomic testing. Despite these patterns, this is the age group in which we have seen the least activity in measurement and valuation of child health-related quality of life (HRQoL), presumably because it is more difficult conceptually and methodologically. Recently, we have seen more options for the measurement of HRQoL through preference-weighted measures such as the adapted EQ-5D-Y for 2-4 years, EQ-TIPS, HUPS, CHU9D for children under five years, and the PedsUtil with growing psychometric evidence. Now is an ideal time to discuss, tackle and advance some of the valuation challenges that follow. Key issues include whose preferences to include in valuation tasks given many in the

general population have little insight into experiences of young children. Other issues include how to frame tasks, define child age, and anchor latent preferences.

Research Question: What are the task-related and valuation preferences of the general population and parents for health states of children under 5 years?

Methods: We conducted two studies as part of a larger research program. Firstly, we conducted 17 individual online semi-structured think-aloud valuation interviews with Australian adults (9 parents and 8 non-parents). Secondly, we conducted a valuation study among the general Australian adult population exploring the impact of age framing and parenthood on preferences for health states described by the CHU9D. We surveyed 3112 participants randomly allocated to the 2-4 year old or 10 year old child framing using a latent scale discrete choice experiment (DCE). The survey's latent values were anchored to a utility scale using visual analogue scale responses.

Key results: In think aloud tasks participants favoured the inclusion of those with experience of children. Despite asking participants to think of a 'hypothetical' child, participants tended to think of their own child or a child they knew. There was no preference for stating a specific age for a young child, but participants did feel their valuation responses would differ compared to being asked about an older child (i.e., 10 years or older). Participants showed evidence of pulling in additional considerations to valuation tasks such as caregiver spillovers, future spillovers, and whether health states would improve naturally or were treatable. Key findings from the valuation DCE were that there were no important differences in general adult population's preferences between the two age framings (2-4y vs 10y). However, there were significant differences in the preferences of parents compared to non-parents, with smaller disutilities for severe levels of pain, tired and activities.

Conclusions and implications: This research has important implications for understanding differences in preferences, and how to design valuation tasks of health states for children under 5 years. The research informs the need for age-specific value sets for HRQoL instruments for children under 5 years.

3:00 PM –3:30 PM TUESDAY [Social Events]

Bali International Convention Centre – BICC Foyers

Refreshment Break

3:30 PM –5:00 PM TUESDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Nusantara 1

Determinants of Healthcare Utilization: From Social Factors to Knowledge Gaps

MODERATOR: **Laura Anselmi**,

abs-os261 Persistence Pays Off? More Persuasive Health Workers Increase COVID-19 Vaccine Take-Up in Ghana

PRESENTER: **Mylene Lagarde**, London School of Hygiene & Tropical Medicine (LSHTM)
AUTHORS: Marta Grabowska, Salifu Amadu

How to convince people to get vaccinated? Against the backdrop of a resurgence of vaccine hesitancy following disinformation and concerns around the COVID-19 vaccines, this question is more critical than ever. In this paper, we explore whether frontline healthcare workers can convince patients who come to receive curative care, to get vaccinated on the same occasion. Whilst integrating vaccination or other preventive care into routine consultations may be a promising and low-cost strategy, it is unclear whether (1) healthcare providers are willing to engage with patients beyond the usual consultation and (2) whether they can convince patients to take up vaccination. To answer these questions, we partnered with the Ghana Health Service to conduct a cluster-randomized control trial in 120 facilities in 4 regions with low COVID-19 vaccination rates. To test if providers can be motivated to offer vaccines to patients, 40 facilities were randomly allocated to a "light touch" intervention, where district health officials paid a visit to encourage all clinical staff to discuss COVID-19 vaccines with patients during curative consultations. To test the role of provider communication skills, 40 health facilities were randomized to receive both the "light touch" treatment and an additional day of "communication" skills training for providers, which focused on overcoming hesitancy and building patient trust. The remaining 40 facilities received no treatment. Using data collected from 5,400 patients for 8 weeks after treatment, we find that providers in both treatment groups talked to patients about COVID-19 and vaccination 6 times more than in the control group, where this occurred in only 5% of consultations. Only the facilities where providers received the additional training saw an impact on COVID-19 vaccine take-up, which increased 7.6 times (2.3%) relative to the control group (0.3%). We detect no change in patients' knowledge about COVID-19, (mis)perceptions of the vaccine, or own-risk beliefs. Using detailed data from consultations by 'mystery' patients (enumerators presenting as real patients), we show that the increase in vaccination in "communication" facilities may come from improved communication and inter-personal skills by providers, who inquire more about the patients' concerns and spend more time-sharing information about the vaccine. Finally, we find no evidence of unintended consequences of the interventions, such as reduced patient satisfaction, increased waiting times or reduced quality of care. Overall, our results demonstrate the potential for leveraging existing resources in the healthcare system to convince people to get vaccinated in low-income settings, as long as investments are made to ensure that patients are not simply "talked at" but "listened to".

Ind-1054 Value of Knowledge in Unexpected Health Shocks: Evidence From Physicians as Patients

PRESENTER: **Yajie Wang**, Peking University
AUTHORS: Junjian Yi, Mr. Ye Yuan, Kamhon Kan

Medical knowledge is crucial in disease management. However, few studies have rigorously examined and quantified its impact on the early detection and clinical outcomes of unexpected health events. This study investigates the role of medical knowledge in managing unexpected health shocks, focusing on clinical outcomes following a first-ever ischemic cerebrovascular event.

Using detailed administrative electronic medical records (EMRs) from 1996-2011 for Taiwan residents born between 1953 and 1957, we compare physician and nonphysician patients to assess differences in mortality, readmission, and acute ischemic stroke rates between 7 and 365 days after their first-ever ischemic cerebrovascular event. We use coarsened exact matching (CEM) to match nonphysician patients with comparable demographics, pre-stroke income, geographic access to care, and pre-shock health status to physician patients. Our findings reveal that physician patients have significantly lower mortality and readmission rates, as well as a reduced likelihood of recurrent strokes, after adjusting for treating physician and hospital fixed effects. These advantages stem from early detection, timely intervention, and informed treatment decisions. Specifically, physician patients have a 7.05% lower probability of hospitalization, and lower least absolute shrinkage and selection operator (LASSO) algorithm predicted hospitalization rate at their first ischemic cerebrovascular event. We also categorize ischemic cerebrovascular diseases into transient ischemic attack (TIA), intracranial artery stenosis (ICAS), and acute ischemic stroke (AIS) as proxies for disease severity. Patients initially diagnosed with TIA or ICAS generally had milder disease, while those with AIS had more severe symptoms. Physician patients were more likely to experience TIA or ICAS and less likely to experience AIS compared to nonphysician patients, suggesting earlier detection and treatment. Despite having less severe initial disease, physician patients tend to incur higher medical expenditures compared to nonphysician patients at the onset of an ischemic stroke.

Subsequently, we include initial disease severity measurements and five expenditure quartiles for medical expenditures at first-ever cerebrovascular disease in the matching process. The differences in mortality rates, readmission rates, and the probability of experiencing an acute ischemic stroke between physician and nonphysician patients become statistically insignificant. This suggests that the advantage of physician patients over nonphysician patients in initial cerebrovascular disease management may partly lie in early detection and early treatment. Once these factors are accounted for, the statistical significance of this advantage diminishes, though the underlying benefit still persists. We also test the external validity of these findings in the context of ischemic heart diseases.

We then explore how the general population can perform as well as physician patients. For general patients who achieve comparable outcomes in early detection and timely treatment, we estimate an additional annual expenditure of TWD 706 on primary and preventive care in the decade preceding their ischemic cerebrovascular disease—a cost-effective investment that enhances disease prevention and early health monitoring. The findings highlight the critical role of medical knowledge, as well as primary care, in mitigating unexpected health shocks and improving health outcomes and quality of life. Improved primary care can help bridge the gap in medical knowledge for the general population.

Ind-1025 The Long-term Hospital Costs of Women who Experience Intimate Partner Violence

PRESENTER: **Bonny Parkinson**, Macquarie University
AUTHORS: Jananie William, Deborah Loxton, Dana Hanna, Bronwyn Loong

Intimate partner violence (IPV) is a pervasive global public health problem with far-reaching consequences for affected individuals and society. This study comprehensively quantified the impact of IPV on long-term hospital utilisation and costs for a young cohort of women. We conducted fixed effects regression analysis on a unique longitudinal survey linked to hospital administrative data over 11 years, while controlling for observed and unobserved time-invariant confounders (N=5608). Women who reported experiences of IPV had a similar likelihood of being hospitalised and length of stay, but had 0.077 ($P<0.01$) additional hospital visits per annum, leading to 47.9% ($P<0.05$) additional hospitalisation costs per annum, than women without reported experiences of IPV. The impact of IPV on hospitalisation costs was not significant after controlling for whether the woman was hospitalised, suggesting that hospitalisation frequency, not the reason for hospitalisation, was the key driver of costs. We also find that younger women and women with chronic illness who experience IPV were more likely to be hospitalised, and were more likely to be hospitalised for a range of reasons, particularly relating to mental health, nervous system, respiratory system, and injuries & poisoning. The relationship between IPV and increased hospital costs was robust to omitted variables, based on a series of robustness tests, and reverse causality, based on the fixed effects approach. The results strongly support the conclusion that IPV has significant long-term health impacts that translate to increased hospital utilisation and costs that persist over time and are not confined to increased hospitalisation due to injury when experiencing IPV.

Ind-1150 Process and Outcome Evaluation of Integrating Primary Eye Care into Primary Health Care: A Quasi-Experimental Study in Rural China

PRESENTER: **Xiaochen Ma**
AUTHOR: Xiaodong Dong

Background Visual impairment represents a major public health challenge, particularly in low- and middle-income countries (LMICs), where unmet needs for eye care remain substantial. The World Health Organization's 2019 *World Report on Vision* emphasizes the integration of primary eye care (PEC) into primary healthcare (PHC) as a key strategy for addressing this gap. This study evaluates the effectiveness and implementation of a model integrating PEC into PHC (*Eye CARE Model*) in rural China. **Methods** From 2021 to 2023, the *Eye CARE Model* was implemented, focusing on Capacity building, Awareness raising, and Referral system Establishment (CARE). We employed a quasi-experimental design with a difference-in-differences (DID) methodology to assess the intervention's impact on service utilization. Data from the local health administrative information systems were used, spanning two years before and three years after the intervention (2019-2023). Key outcomes included primary and secondary eye care utilization, with covariates from the China County Statistical Yearbook. The DID model,

integrated with two-way fixed effects, evaluated the effect of the intervention, and event study methodology was used to track dynamic effects over time. A nested process evaluation explored facilitators, barriers, and implementation outcomes. Qualitative data were gathered through 15 focus group discussions with 148 participants (34 health providers and 114 rural residents). Thematic analysis, combining inductive and deductive approaches, identified key factors influencing implementation. All interviews were coded in NVivo 10.0, ensuring reliability and validity through triangulation with quantitative data. **Results** The *Eye CARE Model* significantly increased the utilization of both primary and secondary eye care services. Specifically, the intervention resulted in an average increase of 76 visits per 10,000 people for primary eye care services and 52 visits for secondary eye care services. The DID model, integrated with a multiple linear regression model, demonstrated the effectiveness of the *Eye CARE Model* in increasing service utilization. The event study methodology further illustrated the dynamic impact of the intervention over time. Additionally, the *Eye CARE Model* improved community-based eye health education and successfully established a three-tiered referral system. Process evaluation revealed high fidelity and broad reach, with local government support and the healthcare organizational structure identified as key facilitators. However, challenges were encountered in sustaining incentives and integrating PEC-related indicators into local health management and information systems. **Conclusions** The *Eye CARE Model* effectively enhanced eye care service utilization and demonstrated the potential for integrating PEC into PHC in rural China, leveraging the existing hierarchical healthcare system. Our findings underscore the importance of contextual factors in the successful implementation and sustainability of complex interventions in LMIC settings. These results have significant implications for scaling up PEC interventions in similar contexts and highlight the need for continued policy and system support to ensure long-term impact. **Keywords:** Primary eye care; Primary healthcare; Process evaluation; Outcome evaluation; Quasi-experimental study; Rural China

Ind-1579 The Impact of Thermal Home Upgrades on Healthcare Utilisation and Costs of People With Cardiovascular, Respiratory and Mental Health Conditions

PRESENTER: **Dan Liu**, University of Technology Sydney
AUTHORS: Lutfun Hossain, Katie Page, Rosalie Viney

Background: The relationship between the home environment and health outcomes has gained significant attention. Randomised controlled trials (RCTs) in the northern hemisphere and New Zealand demonstrate that improving the thermal comfort of homes has generally positive effects of health and well-being, especially for vulnerable populations and conditions like cardiovascular, respiratory and mental health. However, there is currently no evidence of health benefits in an Australian context. Results across countries may vary due to differences in climate, the quality of the housing stock and existing levels of energy efficiency.

Objectives: The Victorian Healthy Homes Program (VHHP) is Australia's first RCT examining the impact of thermal home upgrades on health outcomes in vulnerable older individuals during winter. The program aimed to provide home upgrades for 1,000 households (1,300 individuals), offering up to $3,500 per household to improve thermal comfort and energy efficiency. This paper evaluates the impact of the VHHP on total healthcare costs, hospital admissions, Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Schedule (PBS) services, focusing on cardiovascular, respiratory, and mental health conditions linked to cold temperatures.

Methods: The VHHP was implemented over three years using a staggered, parallel-group clustered RCT. Households were assigned to either an intervention group, receiving a home upgrade before winter (July – September) in 2018-2020, or a control group, receiving an upgrade after winter. Survey data were collected through interviews. Medical and pharmaceutical records were provided by Services Australia. Hospital data was tracked through the Victorian Admitted Episodes. The observation period for the datasets is from 2015 to 2021. To assess the impact of the intervention on healthcare utilisation and costs from 2015 to 2021, we first employ ordinary least squares regression. Second, using a difference-in-differences approach, we exploit the impact of the intervention on healthcare outcomes over the winter months from 2008 to 2020. Third, we apply an interrupted time series analysis to evaluate the program's impact over the two years preceding and one year following the intervention for the intervention group. All models control for age, gender, location, and year fixed effects.

Results: This study demonstrates that, in the short term, a modest investment in improving housing quality led to reductions in total healthcare costs and hospital admissions for individuals with cardiovascular, respiratory, and mental health conditions, although these results were not statistically significant. Due to limitations in data availability, the impact of the VHHP could not be assessed beyond one year following the intervention. However, given that the housing upgrades are permanent, there is potential for long-term health benefits for individuals with cardiovascular, respiratory, and mental health conditions.

Discussions: This program provides novel and rigorous evidence that modest home upgrades can positively impact healthcare costs and hospital admissions. Key strengths of this study include the randomised design and comprehensive linked health data for the same cohort. These findings contribute valuable evidence to the growing body of research on the co-benefits of housing improvements, highlighting the potential for broader public health impacts through targeted housing interventions.

3:30 PM –5:00 PM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Magnolia

Mental, Psychological and Social Health Needs

MODERATOR: **Eran Politzer**,

Ind-1623 An Updated Systematic Literature Review of the Economic Costs of Loneliness and the Cost-effectiveness of Interventions targeting loneliness

PRESENTER: **Lidia Engel**, Deakin University
AUTHORS: Muhammad Fikru Rizal, Cathy Mihalopoulos, Jan Faller, Sharon Clifford

Background: While the literature on health outcomes related to loneliness and social isolation has grown in recent years, our understanding of the economic outcomes associated with loneliness and social isolation is limited. A previous review published in 2019 by Mihalopoulos et al. identified only 12 studies of which four estimated the costs of loneliness, with the remaining studies examining the cost-effectiveness of interventions targeting loneliness and social isolation. There has been a growing interest into loneliness research, especially following the COVID-19 pandemic, emphasizing the importance of understanding its economic impact.

Aim: To update a previous review on the economic costs associated with loneliness and social isolation as well as evidence on the cost-effectiveness of interventions to prevent or address loneliness and social isolation.

Methods: Four bibliographic databases (Medline, PsycINFO, CINAHL, and Embase) were searched from 2018 onwards using a combination of keywords and subject headings, complemented by a search of grey literature. Cost-of-illness and economic evaluation studies, including return on investment studies, were included in the review that were published in English language. All studies were evaluated for quality and summarized using a narrative approach.

Results: In total, fourteen studies were included of which six were cost-of-illness studies (USA=1; Spain=1; Australia=1; Netherlands=1; Japan=1), three full economic evaluation studies (UK=1, Australia=1; Netherlands=1), and five social return on investment studies (UK=4, Australia=1). Most cost-of-illness studies focused on healthcare and productivity cost, with only a few studies considering other costs, such as informal care and wellbeing cost. All, except one study, reported excess cost associated with loneliness either at the population level or person level (i.e., costs associated with a lonely or socially isolated person). Among the three economic evaluation studies, two were modelled cost-utility and cost-effectiveness analyses focusing on older adults, while the third comprised a trial-based cost-utility analysis targeting low-income individuals with health problems. While the probabilities for the interventions being cost-effective ranged between 54% in study one to 55%-68% in study two, the third study found that any interventions that reduce levels of severe loneliness in older people are cost-effective but unlikely to be cost-saving. Further, all social return on investment studies demonstrated positive returns, ranging between £1.17 for a dementia peer support group to AUD 8.21 for an emergency animal boarding.

Conclusion: This updated review identified a number of recent studies on the economic outcomes of loneliness; however, the evidence remains limited, underscoring the need for further research. While cost-of-illness studies that extend beyond the healthcare sector (e.g., incorporating education costs) are warranted, further evaluations of the cost-effectiveness of interventions are needed, focusing not only on older adults but also on other population groups.

Ind-281 Economic Evaluation of Cognitive Behavioural Therapy for Insomnia (CBT-I) For Comorbid Insomnia and Depression in An Australian Context

PRESENTER: **Cathy Mihalopoulos**
AUTHORS: Phuong Le, Long Le, Shantha Rajaratnam

Abstract:

Background:

Recent studies have shown that conventional treatment for comorbid insomnia and depression, which primarily targets depression with the expectation that both depressive and insomnia symptoms will improve, has limited effectiveness. Cognitive behavioural therapy for insomnia (CBT-I), the first-line treatment for insomnia, has been proven to yield significant effects on both symptoms; however, evidence of its cost-effectiveness is lacking.

Research aims:

This study evaluated the cost-effectiveness of three ways to incorporate CBT-I into the management of this comorbidity compared to the conventional treatment: CBT-I adjunctive to ongoing treatment-as-usual (TAU) for depression compared to TAU alone (*Sequential treatment - depression first*); Concurrent use of CBT-I and antidepressant compared to antidepressant alone (*Concomitant treatment*); Standalone CBT-I compared to antidepressant (*Standalone*) over a twelve-month time horizon from both healthcare and societal perspectives in an Australian context.

Methods:

Both face-to-face (F2F) and digital CBT-I (self-help and guided) modalities were evaluated depending on the availability of clinical evidence for each treatment approach. Modelled cost-utility analyses were applied using a decision tree model. The health outcome of interest was quality-adjusted life years (QALYs). A commonly referenced threshold of A$50,000/QALY was applied in this study. All costs were presented as 2023-24 Australian dollars (A$).

Randomised controlled trials (RCTs) of CBT-I for comorbid insomnia and depression were selected using a meta-review approach, and an updated search was performed to identify trials not covered in published systematic reviews. Pooled relative risks for the remission of insomnia and depression were estimated using (network) meta-analyses of the RCTs. Probabilistic and deterministic sensitivity analyses were applied to

explore uncertainties in the results.

Key results:

The studies identified to evaluate the effectiveness of interventions included: one study for *standalone* was identified (F2F CBT-I: n = 1)*;* three studies for *concomitant treatment* (F2F CBT-I: n = 3)*;* five studies for *sequential treatment* (F2F CBT-I: n = 3, self-help digital CBT-I: n = 1, guided digital CBT-I: n = 1). The cost-effectiveness of standalone F2F CBT-I compared to antidepressant and digital CBT-I adjunctive to TAU for depression compared to TAU alone was uncertain. ICERs of F2F CBT-I, when used concurrently with antidepressants and when added to ongoing TAU for depression,* compared to depression treatment alone* were A$34,268 (95% CI: 6,222 – dominated) and A$7,829 (95% CI: 1,186 – 34,698) below the threshold from the healthcare perspective and dominant (less costly and more effective) from the societal perspective. However, the cost-effectiveness of the *concomitant treatment* approach was very sensitive to the effect size and intervention cost of F2F CBT-I. The probability of F2F CBT-I added to ongoing TAU being cost-effective was approximately 99% for both perspectives.

Conclusions and implications for policy:

The findings of this study suggested that among the three treatment approaches, introducing F2F CBT-I after standard treatment for depression that has been implemented is the most cost-effective strategy. Sensitivity analyses showed the robustness of this result. The uncertain effectiveness of digital CBT-I needs more studies to strengthen the current evidence. Adherence plays an important role in gaining the effectiveness of CBT-I, especially digital CBT-I.

Ind-515 Cost-Effectiveness of Multicentre Primary-Care Based Randomized Controlled Trial on PTSD Symptoms in ICU Survivals (PICTURE)

PRESENTER: **Elzbieta W. Buczak-Stec**, University Medical Center Hamburg-Eppendorf; Department of Health Economics and Health Services Research / HCHE
AUTHORS: Daniela Lindemann, Christian Brettschneider, Jochen Gensichen, Robert P. Kosilek, Linda Sanftenberg, Konrad Schmidt, Hans-Helmut König, Thomas Elbert, Bernhard Zwißler

Background The survival rate of patients admitted to intensive care units (ICU) increased markedly over recent decades. Nevertheless, approximately 20% of patients develop post-traumatic stress disorder (PTSD) following a stay in ICU. Recent studies have demonstrated that psychological interventions can effectively reduce PTSD symptoms. However, the cost-effectiveness has not been evaluated. **Aim** The aim of this study was to assess the cost-effectiveness of a novel brief multicomponent primary care-based intervention for ICU survivors suffering from PTSD over 12 months from societal perspective. **Methods** The PICTURE trial was a multi-centre, randomised controlled superiority trial that recruited adult survivors of critical illness with symptoms of PTSD who were discharged from ICU. The participants were randomly assigned to receive either an intervention comprising consultations based on Narrative Exposure Therapy (NET) with a general practitioner or to receive improved treatment as usual (iTAU). The cost-effectiveness analyses after 12 months were evaluated from a societal perspective. As *cost measures*, we used mental healthcare costs (primary outcome) and total costs (secondary outcome). Mental health costs included e.g., the cost of psychiatric/psychosomatic hospitalisation, psycholeptics and psychoanaleptics drugs, outpatient visits to psychiatrists. Total costs included intervention costs, healthcare use and work absenteeism. Healthcare use (inpatient care, outpatient care, medication, long-term care) and work absenteeism were collected using German version of the CSSRI. As the *effect measures* we used the change in PTSD symptoms from baseline to follow-up (primary outcome) and quality-adjusted life years (QALY), secondary outcome. PTSD symptoms were measured by Posttraumatic Diagnostic Scale (PDS-5; 0-80) and QALY by EQ-5D-5L questionnaire. To account for missing data we conducted MICE. The differences in the costs and effects were assessed using seemingly unrelated regression method adjusted for age, sex, and respective baseline costs, EQ-5D or PDS-score. We calculated ICER and a cost-effectiveness acceptability curve (CEAC). Nonparametric bootstrapping was used to show uncertainty around the ICER. **Results**

Between October 2018 and January 2023, 1,283 patients discharged from ICU were screened for PTSD symptoms and 319 were randomized. In total, 160 belonged to the intervention group and 159 to the control group. At baseline, the average PDS-5 score was 30.6, average age 57.6 (SD 13) and EQ-5D index value was 0.71. Preliminary results showed that, in adjusted analyses after 12 months, the NET group had significantly higher mental health care costs (+€754€ [95%CI €339–€1,245]), and non-significantly higher total costs (+€84.24€ [95%CI[€-12,743–€13,420]). In addition, compared to the iTAU group, the intervention group had a greater reduction in mean PDS-5 score (5.09 [95%CI 1.40–8.79]) and had more QALYs (0.041[95%CI 0.011–0.072]). The results of primary cost-effectiveness analysis showed that the ICER was 148.13€ per one point reduction of PDS-5. The CEAC showed that the intervention has high probability of being cost effective in reducing PTDS symptoms (WTP 2,000€).

Conclusions Our preliminary analysis revealed that even though the NET oriented intervention in comparison to iTAU was effective in reducing PTSD symptoms in ICU survival individuals, this intervention had moderate probability of being cost-effective.

Ind-1123 Costs Outcomes and ROI of Intersectoral Interventions for Mental, Neurological, Substance-use Conditions & Intellectual Disabilities in South Africa

PRESENTER: **Donela Besada**
AUTHORS: Crick Lund, Sumaiyah Docrat

Background: In South Africa, mental, neurological, and substance-use (MNS) conditions impose a substantial burden on the health system, with marked inequities in mental healthcare access. The National Health Insurance (NHI) was first proposed in 2011 as a means to promote equity in healthcare access towards universal health coverage (UHC). However, South Africa's continued reliance on historical patterns of budget allocation maintains the status quo of sub-optimal and inequitable mental health resource use, highlighting the need for increased strategic priority setting and transparent decision-making processes. There is concern that unless mental health priorities are clearly

incorporated into the policies and activities guiding NHI implementation, mental health may be overlooked. In response, the South African Mental Health Investment Case (MHIC) was commissioned by the National Department of Health and Treasury to guide resource allocation for mental health, emphasizing integrated community-based care, efficient service delivery, and a focus on both preventative and curative interventions.

Methods: The MHIC evaluated the return-on-investment (ROI) from scaling up interventions for anxiety, depression, psychosis, bipolar disorder, epilepsy, intellectual disability, child behavioural disorders, dementia, and substance-use disorders. The analysis utilized the WHO Inter-UN OneHealth Tool and an Excel-based model to project health benefits and estimate the total economic and social value over a 15-year period. The MHIC also incorporated a comprehensive stakeholder consultation process, a Delphi study for expert consensus, and considerations for programmatic enablers and infrastructural requirements.

Results: We found that the investment needed by the health department translates to 9% of the projected health budget expected by 2035. This is within international recommended norms of allocating 5-10% of the total health budget to mental health. Unaddressed MNS conditions represent an annual loss of 4% of the country's GDP. Across all conditions, the estimated cost of mental health scale-up reflects just 11% of the economic value of lost productivity due to MNS conditions over the 15-year scale-up period. The investment case also demonstrates substantial returns on investment for several specific interventions. These include psychosocial interventions coupled with psychotropic medication for adult depression and anxiety (RoI=4.0:1 and 1.5:1), social-emotional learning programmes for adolescents (RoI = 1.9:1), the identification and treatment of perinatal depression (RoI = 4.7:1), early prevention programmes for risky alcohol use (RoI= 1.2:1), and treatment of epilepsy through basic psychosocial support and antiepileptic medication (RoI = 1.8:1).

Conclusions: The MHIC highlights the critical need to address the growing burden of MNS conditions. It provides a robust framework for integrating mental health services into the NHI benefits package and emphasizes the economic rationale for investment. The comprehensive approach includes considerations for social determinants and cross-departmental costs, promoting collaborative planning and supporting economic recovery. The MHIC highlights best practices for ROI analysis by integrating key guiding principles. It fosters collective ownership with national and provincial health departments to enhance relevance and implementation potential, while valuing diverse local expertise to prioritize interventions across clinical, policy, and system levels. A focus on feasibility ensures realistic evaluations of programmatic and resource needs, and a commitment to data integrity leverages high-quality local evidence.

Ind-2236 The Impact of Short-term Psychotherapy on Sick Leave Among Individuals With Depression or Anxiety Disorders

PRESENTER: **Olli Kurkela**

AUTHORS: Heli Järnefelt, Aki Vuokko, Ari Väänänen, Sanna Selinheimo, Erkki Heinonen, Pauliina Mattila-Holappa, Kia Gluschkoff

Background: Depression and anxiety disorders are leading causes of work disability worldwide, substantially affecting working life through reduced work performance, increased absenteeism, long-term disability and early retirement. Psychotherapies are evidence-based treatments for depression and anxiety disorders and are included in clinical guidelines for managing these disorders in many countries. However, research on the effectiveness of interventions is primarily focused on mental health outcomes, while a more depth understanding of effective treatments on occupational outcomes is limited. **Study aim:** This study aimed to evaluate the impact of short-term psychotherapy (treatment) in an occupational health care setting on sick leave among individuals with depression or anxiety disorders. **Methods:** The treatment consisted of 1 to 20 short-term psychotherapy sessions with duration of 45 to 60 minutes, tailored based on the individual's needs and goals. The treatment group was identified from the occupational health care patient population of Terveystalo, Finland's largest occupational health care provider, between 2017 and 2022. Each individual that initiated psychotherapy was matched with 3 controls using propensity score matching. The model incorporated the intervention as the outcome, with predictors including gender, age, marital status, income, education, employer's size and industry, history of psychotropic drug purchases, as well as the number of other mental-health-related and comorbidity diagnoses. The study outcome was work disability,* measured by the number of sickness absence days due to depression and anxiety disorders (ICD-10 codes F32-33 and F40-F43). The outcome was assessed over four three-month periods before and after the intervention. Group-based trajectory modelling was employed to identify groups of patients with similar absence trajectories before the intervention. Association of socioeconomic and employer-related factors with trajectory memberships were investigated using multinomial logistic regression. **Results:** A total of 2656 individuals were identified as having at least one short-term psychotherapy visit to occupational health care during the study period. These were matched with individuals not receiving treatment (1:3 ratio), resulting in 7958 controls. According to the preliminary results, three distinct trajectories were identified, each demonstrating unique development of sick leave days prior to intervention and including a sufficient number of both treated and untreated individuals for further analyses. One trajectory showed only negligible number of sickness absences during the follow-up, while the two other showed an increasing trend towards the start of the psychotherapy. Out of socioeconomic factors, higher education was negatively associated with risk of belonging to the two more severe trajectories. Psychotherapy was associated with a decline in sickness absences in all trajectories. **Conclusions and implications:** The study provides evidence on the impact of short-term psychotherapy on an individual's ability to work, which can guide decision-makers within the occupational health sector. However, further evaluation of the intervention's cost-effectiveness is essential.

3:30 PM –5:00 PM TUESDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Executive Room 2

Evaluation of Maternal Child Health Programs

MODERATOR: **Lisa Cameron**,

Ind-222 Leader Identity and Cesarean Childbirths: Evidence From Random Allocations of Female Leaders in Indian Villages

PRESENTER: **Mujaheed Shaikh**, Hertie School
AUTHOR: Raf Van Gestel

Cesarean section (C-section) use for childbirth currently accounts for more than 1 in 5 of all childbirths (21%) worldwide and its use as a mode of delivery is expected to rise to 29% by 2030. In India, C-sections are increasing at an alarming rate with some states having C-section rates as high as 54%. The focus on birth by C-sections is a topic of policy interest for at least two fundamental reasons. First, it has consequences for women's health and economic outcomes, and second, it has been widely documented that birth by C-section as opposed to vaginal birth has detrimental effects on child development and long run outcomes. While C-sections may be medically necessary, not all C-sections are carried out for medical reasons. Therefore, policy makers have taken great efforts in reducing unnecessary C-sections and have introduced laws/ guidelines/regulations for controlling C-sections births. In this paper, we focus on the policy effects of electing a female leader at the local level and its impact on healthcare services (more generally) and C-section rates (more specifically). Due to the endogenous nature of election outcomes, we leverage a policy experiment in India that randomly allocated 1/3rd of all positions of chief at the village level to women. As these women leaders are randomly elected, we are able to elicit the causal effect of female leaders on C-sections and identify key mechanisms driving our results. We use data on fertility history of women from the Indian Human Development Survey (2011-12) and complement this data with data on elections from the Ministry of Panchayati Raj to exactly identify the year elections were due in each state. Using exogenous variation in leader identity due to random allocation of chief positions for women, we find that in villages where female leaders are elected, C-sections are lower by 4 percentage points. Data on complications during birth allow us to show that the reduction was primarily in unnecessary C-sections whereas medically necessary C-sections were not affected. We investigate possible mechanisms for this decline and find that female leaders invest in both supply and demand side measures. On the supply side, they improve public hospital infrastructure and the healthcare workforce, and improve access to healthcare institutions by investing in better transport. On the demand side, they incentivize women to utilize healthcare facilities and antenatal care services. We also show cumulative effects over time such that villages with female leaders for a longer duration show larger effects.

Ind-751 Assessing the Impact of Intergovernmental Transfers for Physical Infrastructure on Antenatal and Neonatal Care Utilization in Indonesia

PRESENTER: **Nuzulul Putri**, Universitas Airlangga
AUTHORS: David Hotchkiss, Muhammad Firmansyah, Azizah Ridwanah

This study investigates whether intergovernmental transfers for physical health infrastructure, specifically dedicated to reducing maternal mortality, enhance maternal health service coverage under Indonesia's National Health Insurance (JKN). Using a sample dataset from the Social Security Administration for Health (BPJS Kesehatan) and publicly available data on intergovernmental transfer allocations from 2019 to 2023, we analyze antenatal care (ANC), delivery, and postnatal care (PNC) coverage in districts that received intergovernmental transfers for health infrastructure aimed at accelerating reductions in maternal and child mortality, compared to non-recipient districts. Employing a Difference-in-Differences (DID) approach combined with event-study models, we assess both the immediate and dynamic effects of these transfers on service coverage. The findings show that physical infrastructure investments did not significantly improve ANC or delivery coverage but demonstrated positive effects on PNC visits. Affirmative transfers targeting disadvantaged districts had more immediate impacts on improving service coverage, while non-physical transfers also contributed positively. These results underscore that improving maternal and child health outcomes under JKN requires an integrated approach that aligns infrastructure investments with operational support, targeted fiscal policies for disadvantaged areas, and strengthened governance mechanisms to ensure timely and effective implementation.

Ind-2272 Understanding Health Policy Agenda Setting, Formulation and Implementation in Nigeria: The Case of Maternal and Child Health Reform Programs

PRESENTER: **Chinyere Cecilia Okeke**, University of Nigeria
AUTHOR: Benjamin Chudi UZOCHUKWU

Background: Poor maternal and child health indicators have been reported in Nigeria since the 1990s. Over the years, different interventions for improving maternal, neonatal and child health (MNCH) activities in Nigeria have been in place, yet MNCH indices remain poor. MNCH reforms adopted by the federal government to improve MNCH indices have traditionally focused on broadening access to healthcare, but they do not achieve the expected large impacts. Yet there has been little effort to understand how these decisions are made. This study aimed to explore the implementation processes through which policy actors operate in Nigeria by specifically developing an understanding of the context and the process of these reforms in repositioning MCH on the political agenda in Nigeria. **Methods:** This was an exploratory, descriptive study using qualitative method. The study population comprised policymakers at the Federal and State levels, community members, civil society organizations, health workers, media and academia who were purposively drawn due to the role they played and for proper representation of sectors in the study population. Data was collected through the review of 13 documents, 46 in-depth interviews and 5 focus group discussions. Data was analysed using Leichter's macro context framework; the Walt and Gilson Policy triangle framework and Shiffman and Smith's policy analysis framework. NVivo version 12 was used for coding and organizing data under common themes, and for interpretation. **Key findings:** Four primary themes influenced the policy-making process for MNCH reform programs in Nigeria: situational factors such as poor maternal and child health indices, recovery of funds from dept relief, having a decentralized health system; structural factors such as the top-down approach of these MNCH reforms, the weak nature of the primary health centres, lack of dissemination and understanding of program protocols at subnational level; socio-economic factors such as lack of sufficient funds, weak accountability structures, weak participation of the citizens and corruption on part of public office holders.; international factors such as role of the donor partners, setting of international health agenda and controlling the funds and location for implementation. We developed a model of complex relations between the context, actors, their power and the problem definition in setting the agenda and formulating the policies. A flowchart visually represents the flow of influence and interactions between the contextual influences, policy actors and their power dynamics, problem definition and agenda-setting processes, policy

formulation and implementation stages in MNCH initiatives. **Conclusions and implications for policy and practice** The findings highlight the complex contextual factors and interrelated nature of policymaking that influence the implementation of maternity and child health (MCH) reform programmes in Nigeria. Adopting findings principles, which include understanding power dynamics, advocating for stakeholder involvement, enhancing capabilities, ensuring transparency and accountability, prioritising evidence-based decision-making, and promoting empowerment and ownership, is crucial for developing MNCH policies that are responsive, fair, and efficient.

Ind-311 Bicycles, Empowerment, and Adolescent Health: An Experimental Assessment of Long-Term Impacts of a Gender-Transformative Intervention in Rural Zambia

PRESENTER: **Shruti Shukla**
AUTHORS: Yulia Shenderovich, Choolwe Jacobs, Janina Steinert

Abstract

In this study, we examine the long-term impact of a gender-transformative intervention on maternal and child health outcomes for adolescent girls and their children in rural Zambia five years post-implementation. The intervention, conducted in 2017, provided bicycles to adolescent girls across 91 schools in Zambia's Southern Province to address educational access barriers, including travel costs and safety concerns, to improve girls' school attendance and empowerment.

Using an experimental design with a final sample of 1,615 girls (676 treatment, 939 control), we estimate the causal impact of receiving a bicycle on several mother and child outcomes, specifically: (i) adolescent pregnancy, (ii) antenatal care visits, (iii) folic acid usage, and (iv) institutional delivery, (v) exclusive breastfeeding, and (vi) birth weight for their children. We apply intent-to-treat (ITT) estimates to assess the effect of the treatment on these outcomes. Additionally, we examine potential mediators, focusing on multiple dimensions of girls' empowerment, including decision-making, control, bargaining power, and voice.

Contrary to our hypothesis, we find that the treatment group reported significantly higher rates of adolescent pregnancy, suggesting complex dynamics in gender-transformative interventions. However, girls in the treatment group also exhibited significantly higher levels of empowerment. Mediation analyses are ongoing to clarify how empowerment may influence adolescent pregnancy outcomes in this sample. No significant changes were observed for other maternal and child health outcomes. These findings highlight the multifaceted outcomes of gender-transformative interventions in low-resource settings, where enhanced empowerment can intersect with unintended reproductive health consequences.

Ind-1556 Impact of an Accountable Care Model on the Risk of Suicide Attempts Involving Opioid Poisoning Among Perinatal Medicaid Beneficiaries

PRESENTER: **Jangho Yoon**, Uniformed Service University
AUTHORS: Linh Bui, Mandana Masoumirad, Ara Yoon, Nilam Gibson

Objective: Death by suicide remains one of the most common causes of perinatal mortality, accounting for one-fifth of postpartum deaths in the U.S. This study examined whether a unique health care system transformation, known as Coordinated Care Organizations (CCOs), prevented suicide attempts involving opioid poisoning among Medicaid-enrolled women during pregnancy and postpartum. Implemented in 2013 for Oregon Medicaid beneficiaries, CCOs represent a coordinated care delivery model that explicitly integrates physical and behavioral healthcare with global payment methodology.

Methods: We analyzed Oregon Medicaid eligibility and medical claims data for all Oregon Medicaid-enrolled women of reproductive age (15-44 years old) who became pregnant and gave live births between 2008 and 2018 (N=105,156). The main outcome measure was suicide attempts involving opioid poisoning. We used the interrupted time-series (ITS) research design and estimated segmented logistic regression models to estimate the immediate (and sustained) effects of CCOs, as well as incremental effects over time, separately for the initial system transition period (2013-2014) and post-implementation period (2015-2018). To further explore whether CCOs may reduce the extent of the previously documented link between perinatal opioid use disorder (OUD) and suicide attempts involving opioid poisoning, we analyzed the OUD outcome and estimated a regression model augmented with the OUD indicator and interaction of OUD and post-CCO period. All regression models controlled for substance use disorders, major depression, maternal age, race/ethnicity, rurality of residence, unobserved county heterogeneity, and time trends.

Results: A total of 1,858 suicide attempts involving opioid poisoning (1.8% of the sample) occurred during pregnancy and within one year postpartum. Of these, two-thirds (67%) occurred during this postpartum period. A total of 2,158 women (2.1%) received a diagnosis of OUD during pregnancy, compared to 2,432 women postpartum (2.3%). The CCO model was associated with an immediate decrease of 1.0 percentage point (pp) in the probability of suicide attempts by any means ($p < .001$) and a decrease of 0.07 pp per month in the probability of suicide attempts involving opioid poisoning ($p < .001$) during pregnancy and the one-year postpartum period over the initial system transition period. Specifically, the CCO model was associated with monthly decreases of 0.06 pp ($p < .001$) and 0.01 pp ($p = .010$) in the probability of postpartum suicide attempts involving opioid poisoning during the system transition and post-implementation periods, respectively. Additionally, it was associated with a 0.16 pp decrease per month in the probability of prenatal OUD ($p = .047$) and a 0.6 pp immediate decrease in the probability of suicide attempts by any means during pregnancy and one-year postpartum ($p = .043$).

Conclusions: The CCO model is effective in reducing the risk of suicide attempts involving opioid poisoning among pregnant and postpartum Oregon Medicaid beneficiaries. The findings also suggest that the CCO model may mitigate the previously reported association between

prenatal OUD and postpartum suicide attempts. Transforming the health care system toward a value-based, coordinated care model, such as Oregon's CCOs, may be effective in reducing suicidal behaviors among prenatal and postpartum women. #

3:30 PM –5:00 PM TUESDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Surabaya

Unraveling Socioeconomic Health Disparities

MODERATOR: **Yuanyuan Gu**, Macquarie University, Sydney

Ind-2454 Baseline Distribution of Quality-Adjusted Life Expectancy in Australia: Socioeconomic, Ethnic, and Geographic Comparisons

PRESENTER: **Ali Furkan Kalay**, Macquarie University
AUTHORS: Shan Jiang, Yuanyuan Gu, Bonny Parkinson

Background

Distributional cost-effectiveness analysis (DCEA) is increasingly recognized as a valuable tool for healthcare policymakers analyzing the equity impacts of health interventions across population groups. In Australia, interest in equity informative economic evaluations is growing, with DCEA being a central approach. A critical input for DCEA is the baseline health distribution by population subgroups, as inaccuracies in this parameter can significantly bias conclusions regarding the distributional impacts of interventions.

Aims

This study aims to measure the distribution of quality-adjusted life expectancy (QALE) in Australia by socioeconomic, ethnic, and geographic groups to provide essential inputs for DCEA in the Australian context.

Methods

We utilized data from the Household, Income, and Labour Dynamics in Australia (HILDA) survey, a representative longitudinal dataset of the Australian population. Life expectancy (LE) was estimated using a stepwise modeling approach, starting with non-parametric Kaplan-Meier analysis, followed by Cox proportional hazards models, and culminating in Gompertz models to account for covariates such as income, gender, age, marital status, education, ethnicity, urban/rural residence, and state of residence.

The Gompertz model outputs provided LE estimates for population subgroups defined by socioeconomic status (income quintiles), ethnicity (Aboriginal and non-Aboriginal populations), and geographic location (urban vs. rural, and state-level groups). QALE was derived by applying general population EQ-5D norms stratified by age and gender to the LE estimates.

Results

QALE varied significantly across population groups. Among newborns, the QALE for males in the poorest income quintile was 66.6 years, compared to 71.7 years in the richest quintile—a gap of 5.1 QALYs. For females, the corresponding QALEs were 70.6 years and 73.9 years, with a gender gap of 4 QALYs for the poorest group narrowing to 2.8 QALYs for the richest.

The socioeconomic gap widened with age: at age 0, the QALE gap between the poorest and richest quintiles was 4.2 QALYs; it was 4.5 QALYs at age 20; at age 40, it was 5.1 QALYs; and at age 60, it increased to 5.4 QALYs. Ethnic disparities were also notable. For Aboriginal people at age 20, the QALE was 5.6 QALYs lower than for non-Aboriginal counterparts. Geographic comparisons revealed consistent disadvantages for rural residents compared to urban residents.

Policy Implications

This study provides robust evidence on QALE disparities across Australian population subgroups, offering direct insights into health inequalities by income, ethnicity, and geography. These findings support policymakers in addressing health inequities and provide critical baseline inputs for DCEA. By enabling more accurate analyses of the distributional impacts of health interventions, this evidence can guide equity-informed decision-making and improve resource allocation in Australia's healthcare system.

Ind-179 Educational Gradient in Physiological Risk Factors in a Workplace

PRESENTER: **Toshiaki Aizawa**

This study examines the relationship between educational attainment and health disparities among full-time male employees in a large Japanese manufacturing company, with a particular focus on physiological risk factors associated with chronic conditions, such as overweight status, hypertension, dyslipidemia, and diabetes. Drawing on the concept of the social gradient in health—which posits a decline in health status with decreasing socioeconomic status—this research explores educational inequalities in health within a workplace context, where data availability allows for a robust analysis of health disparities.

The study leverages comprehensive data from mandatory annual health check-ups and personnel records to objectively assess health conditions. Japan's institutional framework for workplace health assessments provides a unique opportunity to utilize anthropometric and blood-based biomarkers, thereby reducing the reporting biases commonly associated with self-reported health data. As chronic diseases are often asymptomatic in their early stages, self-reporting can lead to an underestimation of disease prevalence among less-educated groups, potentially masking the extent of health inequalities. This study's reliance on clinical data thus supports a more accurate analysis of the educational disparities in health.

To dissect these disparities, this research employs decomposition analysis to quantify the extent to which differences between the two educational groups can be attributed to observable factors, including socio-demographic characteristics, physiological measures, and behavioral patterns. The findings reveal that several factors significantly contribute to the observed health disparities, including differences in alcohol consumption, smoking habits, job position, psychological stress levels, and family structure. These factors were found to be more prevalent among employees without university education and serve as major contributors to the higher prevalence of chronic conditions in this group.

The study builds upon foundational research, such as the Whitehall studies, which demonstrated substantial differences in health outcomes by occupational rank independent of traditional risk factors. In line with previous literature, educational attainment—an important dimension of socioeconomic status—emerges as a key determinant of health outcomes. Mechanisms through which education influences health may include greater income and access to resources that support health-promoting behaviors, improved health literacy, and psychosocial advantages such as lower time discounting and enhanced decision-making skills.

The results underscore the persistence of significant health disparities between educational groups within a workplace setting. These findings highlight the importance of targeted interventions to address the needs of less-educated employees alongside universal health-promoting strategies. By identifying specific factors that contribute to educational health inequalities, this research offers valuable insights for policymakers aiming to reduce workplace health disparities. Addressing these disparities through targeted support and resources for employees without university education could be pivotal in promoting equity in health outcomes. The implications of these findings extend beyond the workplace, underscoring the broader societal need to mitigate educational inequalities in health to foster a more equitable and healthier population.

Ind-204 Regional Differences in Mental Health Status (Wellbeing, Illness and Mortality): the Impact of Inequality, Austerity and Regional Public Health

PRESENTER: **Mercedes Gumbau**
AUTHOR: Joaquin Maudos

Mental illness is nowadays one of the causes of major health problems worldwide. In parallel, there is a growing body of evidence in the literature showing that austerity policies affect general health but are specifically associated with worsening mental health and increasing mental health inequalities, particularly for those who are already vulnerable to poor health. As the problem increases, mental disorders are not only seen as an individual problem, but also as a social issue, which must be recognized and taken seriously, emerging the need for regional strategies for the prevention and management of these diseases. For this reason, this paper examines the uneven geography of Risk of poor mental health and non-specific psychological distress, Prevalence in registered mental disorders, and Mortality in mental disorders -that is wellbeing, illness and mortality-, evaluating the factors behind the regional differences in impact and disentangling whether regional inequality in income distribution and health burden influence these mental health indicators, and how the public health system mitigates these effects. Most previous studies related to mental disorders were conducted within a specific age group or geographical area but to date there are only a few studies related to mental health outcomes according to regions. However, the health level of the population group has epidemiological importance, and it is possible to be more effective at managing the cause of the differences in the distribution of health status when accessed at the community level. Therefore, the main hypothesis of the paper is that Risk of poor mental health, Prevalence in registered mental disorders, and Mortality in mental disorders can be explained by regional differences in socioeconomic and environmental factors but also that mental health inequalities are greatest in regions with more income inequality, more austerity and higher health burden. However, greater accessibility to medications, better coordination of care levels, improvements in patient care, and the effectiveness of psychiatric readmissions for instance, mitigate the negative impact of economic inequalities. To this end, the analysis is applied to 17 European regions using econometric techniques as principal component analysis, panel data, and instrumental variables. Between the main novelties of the paper, we can highlight, first, the analysis of not only diagnosed mental illnesses but also the analysis of serious psychological distress or non-specific psychological distress, second the use of Principle Component Analysis for modeling a deprivation index that measures the equity-relevant socio-economic dimension, and third, the use of a regional perspective in the study of mental illnesses, not well elucidated in the literature. The results obtained allow us to conclude that regional differences in income inequality generates a higher rate of illness but not deaths, highlighting the importance of the National Health Service respect to the access to health care for the treatment of the most severe cases. Likewise, unemployment, environmental conditions, and health burden are important factors that determine the differences in mental health among regions.

Ind-982 Disparities in Quality-Adjusted Life Expectancy Associated with Educational Attainment: Population Norms for Australia

PRESENTER: **Sheridan Rodda**
AUTHORS: Rosemary Korda, Jedidiah Morton, Zanfina Ademi, Jennifer Welsh, Melanie Lloyd

Background

Educational attainment is an individual measure of socioeconomic status that has been associated with inequalities in health outcomes. Summary measures of health, such as quality-adjusted life expectancy (QALE), have been used to monitor health inequalities as they reflect

both the quantity and quality of life. Additionally, the distribution of QALE across equity relevant groups within a population can be utilised in equity-informative studies that evaluate the equity impacts of a healthcare funding decision. The Australian distribution of QALE by educational attainment has not yet been reported.

Aim

To estimate QALE stratified by sex and year of age across levels of educational attainment for the Australian population aged 25 to 100 years.

Methods

This cross-sectional study incorporated multiple data sources to estimate mortality rates and health related quality of life in order to generate QALE. Individuals' highest level of educational attainment was allocated to one of three levels: low (did not complete secondary schooling), intermediate (completed secondary schooling and/or another non-tertiary qualification) and high (completed bachelor's degree or above).

The Person-Level Integrated Data Asset linked demographic information for Australian individuals from the Census (2016) to Deaths Registrations during 2016 to 2019. From this data, age-sex-education specific mortality rate ratios were determined and applied to the 2019 population, then mortality rates by year of age were extrapolated using Poisson regression. Unabridged life tables were constructed to determine life expectancy (LE) for each sex-education subgroup with the derived mortality rates.

Wave 22 of the Household, Income and Labour Dynamics in Australia survey collected in 2022-2023 provided a representative sample of Short Form (SF-6D version 1) health utility by educational attainment. Linear regression models for every sex-education group were employed to estimate mean health utility.

The person years lived within the life tables were multiplied by the utility index for each sex-education group to produce QALE. Uncertainty of the estimates was determined via probabilistic sensitivity analysis, and both 0% and 3% discounting applied to QALE estimates.

Results

Both life expectancy and QALE increased with increasing level of education. Males at age 25 with a high level of education had an undiscounted LE of 61.0 years and QALE of 39.9 (95% confidence interval 38.7-41.2) years compared to 53.7 years and 28.8 (27.4-30.3) years respectively for those with a low education level. This represents a difference of 11.1 quality-adjusted life years (39%). Females with high educational attainment had a LE of 63.1 years and QALE 36.9 (35.8-38.1) years (both undiscounted), compared to 59.2 years and 29.3 (27.9-30.8) years respectively for the low education group, a QALE difference of 7.6 years (26%).

Conclusion

There are large disparities in QALE, impacting both the quantity and quality of life, associated with educational achievement in Australia. Tailored policies addressing education-related inequalities in health are needed. This study provides baseline data for future equity-informative economic evaluations.

3:30 PM –5:00 PM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Nusa Dua

Innovative Approaches to Tackling Cancer

MODERATOR: **Ivan Prenhaca**,

Ind-642 Economic Evaluation of Early Trastuzumab Initiation for Treatment of HER2-Positive Breast Cancer in Kenya

PRESENTER: **Prashant Mandaliya**

AUTHORS: Faith Okalebo, Edwine Barasa, Dorothy Aywak

Abstract **Background** Human epidermal receptor 2 positive (HER2+) breast cancer presents a significant public health challenge both globally and in Kenya. Access to trastuzumab, the first-line treatment remains limited in Kenya due to its high cost, with the National Health Insurance Fund (NHIF) covering only 4 of the 18 cycles. Consequently, many patients are unable to complete treatment, leading to poor outcomes. **Aim** This study evaluated the cost-effectiveness and budget impact of different trastuzumab regimens for the treatment of HER2+ breast cancer in Kenya. **Methodology** A cost-utility analysis was conducted from a providers' perspective over a 5-year time horizon. Comparator regimens included 9-week, 6-month, 9-month, 12-month, 16-month, and 24-month courses of trastuzumab, each starting alongside chemotherapy and continuing with trastuzumab monotherapy with the reference group being chemotherapy alone. Direct medical costs associated with the treatment of HER2+ breast cancer were estimated using a micro-ingredient approach. Data on resources used and costs were collected from interviews, market surveys and treatment guidelines, and these costs were then converted to USD, 2022. Effectiveness data was obtained from a literature review. The costs and benefits were analysed using a Markov model with a one-month cycle length over the time horizon. A cost-effectiveness threshold of USD 919.11 was used and a probabilistic sensitivity analysis was conducted. The budget impact analysis was also done over a 5-year horizon. Data analysis was performed in R. **Results** The 9-week regimen had the lowest ICER (USD 45,596.27 per QALY gained), while the 6-month regimen had the highest ICER (USD 59,112.53 per QALY gained). ICER values for the 9-month,12-month, 16-month and 24-month regimens ranged between USD 56,200 to USD 57,000 per QALY, indicating a slight variation in cost-effectiveness depending on the regimen's duration. The 9-week regimen was the cheapest and would cost NHIF approximately USD 33

million and the Kenyatta National Hospital (KNH) just over USD 4 million for a period of 5 years. These estimates are for the projected 6,100 new patients covered by NHIF and 1,830 new patients at KNH over the study period. This would be 1.4% and 0.6% of the projected 5-year budget for NHIF and KNH respectively. In contrast, the 12-month regimen would require approximately 3% and 3.2% of the NHIF and KNH budget respectively over the same period. **Conclusion** At the current threshold, none of the regimens are cost-effective in the Kenyan context. However, given the benefits that these treatments confer, and that the majority of the patients can't afford the current treatment with the 12-month regimen, strategies that would facilitate inclusion of the cheaper 9-week regimen into the treatment guidelines should be considered. For instance, the government should consider negotiating lower prices for trastuzumab and improve access to bio-similars. Additionally, good dispensing practices and vial sharing will help minimize wastage. Lastly, routine breast cancer screening would increase early diagnosis, subsequently leading to better treatment outcomes.

Ind-763 Defining Lifetime Risk Thresholds for Breast Cancer Surgical Prevention: A Cost-Effectiveness Analysis

PRESENTER: **Xia Wei**
AUTHORS: Lea Mansour, Caitlin T. Fierheller, Li Sun, Adam Brentnall, Stephen Duffy, D Gareth Evans, Li Yang, Rosa Legood, Ranjit Manchanda

Background

Increasing awareness, access, broadening of clinical testing guidelines, decreasing costs of genetic testing and availability of validated personalised risk prediction models, are increasingly identifying women at elevated risk of breast cancer (BC) who do not carry *BRCA1*, *BRCA2*, or *PALB2* pathogenic variants (PVs). These women may wish to access risk-reducing mastectomy (RRM) for cancer prevention. RRM is currently recommended for women with a lifetime BC-risk exceeding 30% by the National Institute for Health and Care Excellence (NICE). However, its cost-effectiveness at this risk level has not been formally assessed. Importantly, the precise lifetime BC-risk thresholds at which RRM becomes cost-effective remain undetermined.

Objectives

This study aims to define the lifetime BC-risk thresholds for RRM to be cost-effective compared with non-surgical alternatives for BC prevention.

Methods

A decision-analytic Markov model compared the cost-effectiveness of RRM with risk-stratified BC screening and medical prevention (tamoxifen or anastrozole), among women aged 30 to 60 years at varying lifetime BC-risks from 17% to 50%. The analysis was conducted from the UK health-system payer perspective, with a lifetime horizon until age 80. UK-specific data were used wherever possible, taken from literature and public databases. Costs and health effects were discounted at 3.5%. Incremental cost-effectiveness ratio (ICER) was calculated as incremental cost per quality-adjusted life-year (QALY) gained and compared with the UK willingness-to-pay (WTP) threshold of £20,000-£30,000/QALY. Extensive sensitivity and scenario analyses were performed.

Results

In the simulated cohort of 30-year-old women, undergoing RRM became cost-effective at a lifetime BC-risk of 34% with an ICER of £28,861/QALY, using the £30,000/QALY WTP threshold. This increased to a 42% lifetime BC-risk with an ICER of 19,553/QALY, using the £20,000/QALY WTP threshold. The identified lifetime BC-risk thresholds for RRM to be cost-effective among 35-, 40-, 45-, 50-, 55-, and 60-year-old women were 31%, 29%, 29%, 32%, 36%, and 42%, respectively, using the £30,000/QALY WTP threshold. Overall, undergoing RRM at common ages of 30 to 55 was deemed cost-effective for women with a lifetime BC-risk over 35%, with more than 50% of simulations being cost-effective in the probabilistic sensitivity analysis (PSA). We estimate, offering RRM for women with a lifetime BC-risk over 35% could potentially prevent approximately 6500 BC-cases of the 58,756 occurring annually in UK women. The risk threshold increased to 41% for a longer (2-year) disutility from surgery. In the PSA, 55.04%, 87.36%, and 99.35% of simulations were cost-effective for women with 34%, 42%, and 50% lifetime BC-risk undergoing RRM at age 30.

Conclusions and policy implications

The identified lifetime BC-risk thresholds for RRM to be cost-effective varied by age. Undergoing RRM between the ages of 30 and 55 appears cost-effective for women with a lifetime BC-risk over 35%, which increases to 41% if they experience a longer disutility from surgery. The results could have significant clinical implications to expand access to RRM beyond *BRCA1*, *BRCA2*, and *PALB2* PV carriers, and could potentially prevent 6500 BC-cases annually. Future studies on understanding the acceptability, uptake, and long-term impact of RRM among these women are warranted.

Ind-1038 Cost-effectiveness Analysis of a Polygenic Risk Score to Tailor Colorectal Cancer Screening in Primary Care: The SCRIPT Trial

PRESENTER: **Antonio Ahumada-Canale**
AUTHORS: Adrian Laughlin, Richard De Abreu Lourenco, Jon Emery, Sibel Saya, Patty Chondros

Background: Colorectal cancer (CRC) is the fourth most commonly diagnosed cancer and the second highest cancer-related cause of death in Australia. Early detection has a critical role in improving survival, patient experience, and healthcare costs in CRC. However, 40% of CRC cases in Australia are detected at a later stage, i.e., stages 3 or 4. Currently, Australian bowel cancer screening guidelines are focused on age and family history to guide early detection, despite local and international recommendations to use more precise risk-based approaches. The SCRIPT randomised controlled trial tests adherence to tailored screening recommendations by providing individual's risk reports from

polygenic risk scores (PRS) to patients and general practitioners (GPs) over 12 months.

Aim: To assess the cost-effectiveness of the SCRIPT intervention compared to usual care from the Australian healthcare system perspective.

Methods: The primary endpoint of the economic evaluation is the cost per appropriately screened individual, which aligns with the SCRIPT trial's main outcome. The analysis has 2 components: (1) a within-trial analysis, and (2) a decision-analytic model. The within-trial analysis includes a cost analysis of professional consultations, PRS conducted, colonoscopies, immunohistochemical faecal occult blood test (iFOBT) and medical imaging sourced from the trial and linked administrative sources. Resource use will be valued using Australian public fees for already funded interventions and commercial rates, with costs analysed using generalised linear modelling to account for covariates. Sampling uncertainty will be tested by bootstrapping costs and appropriately screened individuals' percentage. The decision model will evaluate how the incremental cost per appropriately screened individual might vary given differences in the PRS cost, the ability of the PRS to identify those at increased risk, and compliance with risk-stratified screening recommendations. This will be represented by a decision tree incorporating risk profiles with model inputs sourced from the trial. Sensitivity will be explored by one-way sensitivity analyses and a probabilistic sensitivity analysis.

Results: The SCRIPT trial recruited 276 participants with questionnaire response rates higher than 75% by month 12. Data linkage to provide resource use will be completed by the end of 2024. Economic evaluation results and sensitivity analyses will be presented for both the within-trial and modelled evaluations.

Conclusions: This analysis will provide information on the SCRIPT intervention's value for money compared to usual care, providing decision-makers in Australia and internationally with evidence on the implementation and funding of PRS guided screening to improve earlier CRC detection.

Ind-1767 Addressing Diagnostic Delays in Hematological Cancers: Economic Insights from the Rapid Access Diagnostic LymphAdenopathy Clinic (RADLAC)

PRESENTER: **Lucy Cunnama**, University of Cape Town
AUTHORS: Jenna Oosthuizen, David Richardson, Estelle Verburgh, Waarisa Fareed-Brey, Karryn Brown

Background Hematological (blood) cancers, including Hodgkin lymphoma, non-Hodgkin lymphoma, multiple myeloma, and leukaemia, collectively rank fourth in global cancer mortality alongside breast and stomach cancers, with over 700,000 deaths annually. Diagnostic delays remain a critical barrier to improving outcomes, particularly in low- and middle-income countries (LMICs), where a high tuberculosis (TB) burden complicates cancer diagnosis. Fine needle aspiration (FNA), commonly used in TB-endemic settings, often fails to confirm lymphoma or exclude TB. Core needle biopsy (CNB) has become the preferred diagnostic modality, offering definitive results that streamline treatment initiation. However, the economic implications of diagnostic delays and the costs associated with early interventions like Groote Schuur Hospital's Rapid Access Diagnostic Lymphadenopathy Clinic (RADLAC) in South Africa remain underexplored. **Aim** To evaluate the RADLAC diagnostic and economic contributions to address hematological cancer diagnostic delays and compare early diagnosis costs to the financial burden of late-stage cases. **Methods** A retrospective analysis was conducted using RADLAC patient data, focusing on survival and the associated costs. The study compared the costs of CNB, FNA, and surgical excision biopsy (SEB), including direct medical costs (procedure costs and clinic setup) and indirect costs (transportation and income loss, presented elsewhere). Mortality and incidence data were analyzed to contextualize the burden of blood cancers relative to other cancers. Additional data on treatment costs at Groote Schuur Hospital (GSH) were used for comparison. Costs were collected in South African Rands and were adjusted and converted to 2025 United States dollars. **Results** RADLAC has demonstrated CNB effectiveness as the preferred diagnostic modality, particularly in TB-endemic settings, reducing diagnostic delays and enabling timely initiation of treatment. Additionally, SEB at $244 is 68% more costly than CNB at $145 for diagnosing (before staining). The cost of RADLAC's setup and operation was significantly lower than the cumulative costs of late-stage care for hematological cancer patients. Despite its wide use globally, FNA's sensitivity is lower than CNB, even when both are ultrasound-guided. Given the importance of diagnostic sensitivity in avoiding missed cases of lymphoma and haematological malignancies (avoiding false negatives), CNB's superior performance reinforces its role as the preferred modality for definitive diagnosis. **Conclusions and Implications** Blood cancers contribute significantly to global cancer mortality, with comparable death rates to breast and stomach cancers. Globally, incidence numbers are higher than liver, stomach, cervix, and thyroid cancers worldwide. The findings underscore the critical role of early diagnostic pathways in reducing the mortality and financial burden of hematological cancers. RADLAC provides a scalable, less costly model for improving diagnostic efficiency that can be implemented at different levels of care with patient outcomes in LMICs, particularly in high TB-endemic regions. Policymakers should prioritize implementing similar diagnostic approaches and integrate them into cancer care strategies to address the substantial burden of blood cancers. By reducing diagnostic delays, such interventions can improve survival rates, alleviate economic strain, contribute to universal health coverage, and contribute to achieving global health equity. **Acknowledgments:** The research reported was supported by the Cancer Association of South Africa (CANSA) and the South African Medical Research Council (SAMRC).

Ind-2751 Cost Analysis of an AI and Big Data Derived Scores for Use in Early Lung Cancer Idenfitication

PRESENTER: **Yaling Yang**, The University of Oxford

Background: Early diagnosis of lung cancer is contingent on both the detection of a small lung nodule and determining whether it is malignant. Whilst CT has proven to be a robust way of detecting lung nodules, Detection of non-malignant nodules have the unwanted consequences of unnecessary cost as they require follow-up scanning or alternative methods of investigation, cause patient anxiety, may result in increased morbidity potentially by biopsy or resection, and result in increased patient radiation exposure due to follow-up CT scans or from PET-CT scans. The Artificial Intelligence and Big Data for Early Lung Cancer Diagnosis Prospective Study (IDEAL) aims to test the use of novel CT image analysis techniques (i.e. CAP score) incorporated into a clinical risk model in the characterisation of small pulmonary nodules. This study present a cost analysis for the use of CAP score in the IDEAL study.

Methods: A total of 1293 patients were recruited into the IDEAL study in multiple NHS hospitals in the UK. Health care investigations

following the initial CT scan and the incidental detection of lung nodule(s) were observed and recorded within the 12 months follow up of IDEAL prospective observational study, followed the BTS guideline: category 1 patients are discharged without further investigation due to no concerns; category 2 patients are provided with CT surveillance at 3 months or 12 months follow up, and decisions such as discharge or further work up investigations will be suggested; category 3 patients have nodules of concerns of malignancy risk and PET-CT or/and imagine-guided biopsy will be provided and further surgical treatment or other treatment will be provided after clinical assessment of lung nodule(s).

Results: Among the 1102 patients included in the IDEAL study, 364 patient were discharged without follow up investigations on the basis of BTS guidance. On the other hand, less patients would be discharge therefore 178 more patients would be followed up with various investigation if CAP score were used to group the patients in the IDEAL study. This implies that using the CT analysis algorithm CAP score to manage incidental lung nodules will cost NHS more money than using the usual care based on the BTS guidance for the same patient sample in the IDEAL trial. Assuming only one extra CT scan would be provided to the 178 patients, this would cost NHS an extra £16,312. Based on information provided by the company, it costs £27 to £38 to generate CAP score for each nodule. Therefore an extra £50,355 to £70,870 will be required. Overall, it would cost NHS a total of £66,667 to £87,182 extra money (mean £64.5 to £79.1 each) to implement and apply the CAP score based AI system for the 1102 patients in the IDEAL trial. The figures will increase if assuming more CT scans and other follow up investigations would be provided.

Conclusion: This analysis indicate that use of the CAP score at its current cut off points will cost NHS more money than the usual care.

3:30 PM –5:00 PM TUESDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Singaraja

Technological Advances in Data, Digital and Telehealth

MODERATOR: **Louis Niessen**,

Ind-1775 Advancing Hospital Digital Maturity: Evaluating the Impact of Germany's Hospital Future Act with the DigitalRadar

PRESENTER: **Volker Amelung**, "Hannover Medical School - Institute of Epidemiology, Social Medicine, and Health Systems Research"
AUTHOR: Malte Haring

The digital transformation of healthcare is vital for improving care quality, efficiency, and system interoperability. However, empirical evidence on how large-scale policy interventions influence digital maturity over time remains sparse. The Hospital Future Act (KHZG), introduced in 2020, represents a landmark €4.3 billion investment in advancing the digital infrastructure of German hospitals. To evaluate the effectiveness of this initiative, the digital maturity level of all German hospitals was measured. This is the first full survey (>90%) on this topic in any country worldwide. For this purpose, the DigitalRadar was developed, a standardized digital maturity model with seven dimensions, including patient engagement, IT security, telemedicine and clinical processes. This model investigates changes in hospital digital maturity by comparing results from two national evaluations: the baseline assessment in 2021 and a follow-up in 2024. Participation in the DigitalRadar was mandatory for all hospitals receiving KHZG funding, with over 1,600 hospitals assessed at each stage. Employing a longitudinal design, the study combines descriptive analyses, multivariate regressions, and benchmarking against international frameworks like HIMSS EMRAM to identify key drivers of digital transformation and measure progress over time. To ensure the robustness of the results and refine the methodology, an accompanying evaluation was conducted alongside the DigitalRadar assessments. This evaluation used qualitative and quantitative methods to gather feedback from hospital stakeholders on the usability and relevance of the maturity model as well as from patients on the experience with and perception of digital applications in hospitals. The findings highlighted the practicality of the instrument, identified barriers to data collection, and informed refinements for subsequent assessments. This continuous feedback loop enhanced the validity of the DigitalRadar and provided actionable insights into the challenges faced by hospitals during digital transformation. Preliminary analyses from the 2021 baseline revealed an average DigitalRadar Score (DR-Score) of 33/100, with significant variability across dimensions. Hospitals performed relatively well in “Structures and Systems” but showed limited maturity in “Telehealth,” “Information Exchange,” and “Patient Participation,” reflecting persistent challenges in interoperability and patient engagement. Early insights from the 2024 evaluation suggest notable improvements in these areas, driven by targeted funding and strategic adoption of digital tools. However, disparities persist, with smaller and rural hospitals lagging behind their urban and larger counterparts. The longitudinal design offers unique insights into how KHZG-funded projects impact hospital digital maturity over time. By analyzing data across two time points, this study provides evidence of both progress and remaining challenges, informing policy adjustments to promote equity and effectiveness. The findings highlight the critical role of sustained investment, standardized assessments, and international benchmarking in fostering digital transformation. For policymakers, hospital administrators, and international stakeholders, this research underscores the importance of addressing systemic barriers and aligning funding strategies with broader healthcare goals.

Ind-2812 Telemedicine Trials in Indonesia's Universal Health Coverage: Challenges, Progress, and Future Directions

PRESENTER: **Atmi Roseva**
AUTHORS: Mawaddati Rahmi, Mr. Mahlil Ruby, Mr. Ali Ghufron, Donni Hendrawan

Introduction BPJS Kesehatan (BPJSK) initiated its first telemedicine pilot in 2020, involving approximately 125 utilizations over a three-month period. The primary goal was to enhance healthcare access for populations in remote areas with limited healthcare facilities. As an exploratory initiative, the trial aimed to evaluate the feasibility of telemedicine services, identify barriers to implementation, and provide insights for system improvements.

In 2022 and 2023, the program expanded with a more comprehensive trial adopting an *action research* approach. These trials were designed to address logistical challenges, ensure readiness for broader implementation, and refine the system for telemedicine services under the Jaminan Kesehatan Nasional (JKN) scheme. The research also aimed to monitor and evaluate telemedicine's potential in terms of accessibility, satisfaction, and quality of care for JKN participants.

Methods The study employed *action research* and purposive sampling to guide the telemedicine trials. This approach enabled iterative problem-solving and system refinements in response to challenges encountered during implementation. A pre-and post-intervention evaluation was conducted, focusing on service quality, patient satisfaction, and accessibility before and after telemedicine adoption.

The *action research* cycle included the following stages:

1. Identifying specific barriers, such as accessibility issues, inadequate infrastructure, and participant engagement challenges.
2. Planning interventions with input from stakeholders, including healthcare facilities, technology providers, and policymakers.
3. Implementing pilot interventions tailored to address these challenges.
4. Evaluating outcomes using both quantitative and qualitative data, including claim processing times, service uptake, and patient feedback.
5. Refining strategies based on observed results to improve service delivery and scalability.

Results The findings from the 2022–2023 telemedicine trials revealed both progress and ongoing challenges:

1. **System Development**: Out of 26 identified business requirements, 8 remain unresolved, primarily concerning drug delivery logistics and digital prescription integration.
2. **Service Utilization**: While 30.6% of primary healthcare facilities utilized telemedicine services, only 11.8% demonstrated increased adoption over time. Notably, tele-USG services showed no recorded usage.
3. **Claims Management**: Non-capitation claims for telemedicine services in 2023 amounted to IDR 37.38 million, a 22.42% decrease from 2022. The average claim approval time was 3.4 days.
4. **Implementation Challenges**: Persistent issues, including resource limitations and low engagement levels, highlight the need for extended trials and enhanced support for participating facilities.
5. **Community-Based Telemedicine**: Uptake for community-oriented telemedicine services remains minimal, underscoring the need for more targeted socialization efforts.

Conclusion The trials demonstrate telemedicine's potential to improve healthcare access and efficiency within the JKN framework. However, significant challenges remain, including unresolved system issues, limited engagement from participants and providers, and policy gaps.

Recommendations include:

1. Extending the trial period to resolve outstanding barriers and enhance system readiness.
2. Increasing socialization efforts to improve awareness and participation among patients, healthcare facilities, and BPJSK staff.
3. Conducting comprehensive trials within a specific district to more accurately assess cost-efficiency and quality improvements.

Addressing these challenges will be critical for telemedicine to fulfil its promise of transforming healthcare delivery for Indonesia's universal health coverage system.

Ind-2674 Digitalization for Health Service Performance: Challenges and Prospects for a Minimal Digital Ecosystem in Burkina Faso

PRESENTER: **Mr. Joël Arthur Kiendrébéogo**, University Joseph Ki-Zerbo
AUTHORS: Issa Kaboré, Simon Tiendrébéogo, Abib Noellie Konsebo, Yamba Kafando, Orokia Sory, Rémi Kaboré, David Zombré, Relwendé Nacanabo

Background Since July 2023, Burkina Faso has been piloting in two health districts the “Minimal Digital Ecosystem” (MDE) project within its healthcare system to enhance governance, efficiency, and the quality of primary healthcare, as well as to strengthen the nationwide user fee exemption policy known as *Gratuité*. The MDE consolidates eight previously standalone digital tools into an integrated system to create synergies and improve their collective impact. These tools include *E-flux Financier* (tracking health facility cash flow), *E-Gratuité* (monitoring the implementation of the *Gratuité* policy), *E-Qualité* (tracking healthcare quality), *e-SantéCom* (monitoring the activities of community health workers), the digital Individual Care Record for *Gratuité* (tracking prescriptions and billing), *NetSIGL2.0* (managing medicine supply chains), and two diagnostic and treatment aids – *REC-Maternity* and *REC-PCIME* – for maternal and child health. This study explores users' perceptions of these tools, highlights the challenges encountered during implementation, and identifies prospects for the future. **Methods** We conducted three repeated cross-sectional surveys in two intervention districts and two control districts in December 2023, May 2024, and October 2024. Each survey included a total of 72 health facilities and between 591 and 613 users, with the number of users per tool ranging from a minimum of 18 for *E-Qualité* to 170 for *REC-PCIME*. Descriptive quantitative data were analyzed using Excel, while qualitative data were examined through an inductive approach using NVivo software. **Results** Our findings reveal a predominantly positive perception among users of the MDE tools. On average, over 80% of respondents believe that these tools enhance the efficiency of healthcare services by streamlining administrative tasks and optimizing patient follow-up. Efforts to improve interoperability between the tools have been particularly beneficial, facilitating data management and supporting both managerial and clinical decision-making processes. However, approximately 35% of users reported that the complexity of certain tools poses significant challenges to their adoption. Additionally, some tools have experienced prolonged malfunctions, lasting up to a month in some cases, which has undermined the overall effectiveness of the ecosystem. Financial constraints further exacerbate these issues, with many health facilities struggling to afford internet subscriptions, repair costs, or replacement of digital

tools. Persistent challenges with fast and stable internet connectivity also contribute to user reluctance. Despite these obstacles, users remain generally optimistic about the long-term potential of the MDE tools. Stakeholders emphasize the need to strengthen interoperability, implement regular updates, provide continuous skill-building opportunities, and establish dedicated help desks to fully leverage the tools' capabilities. **Conclusions** The MDE holds significant potential to enhance the performance of primary healthcare and the *Gratuité* policy. However, our analysis highlights that stakeholders' engagement and sustained commitment to these tools largely depend on the availability of adequate resources and robust technical support. To maximize the adoption and impact of the MDE tools, it is essential to improve the user experience, simplify tool functionalities, and strengthen support systems.

Ind-2036 Endogenous Growth and Data Utilization in the Digital Health Sector: A General Equilibrium Analysis

PRESENTER: **Anran Li**
AUTHORS: Xuezheng Qin, Yisong Wang, Zifan Li

The digital health sector stands as a prime example of data-driven growth, with predictions indicating a global market expansion at a compound annual growth rate of 17.2% within the current decade. This paper constructs a dynamic general equilibrium model to examine the role of data as a productivity-enhancing factor in the health sector. By incorporating data into the production function and modeling its impact on innovation and resource allocation, we delve into the sectoral and individual level dynamics that result from digital transformation, particularly with regards to health level growth. Our model not only encompasses traditional medical and digital health sectors, but also integrates the interactive effects of multiple economic sectors, including research and development, and consumption. Upon defining the equilibrium, we calibrate the model using key features such as industry share from diverse major economies worldwide and simulate the growth trajectory under various policy and demographic scenarios. We also present an analytical solution under simplified assumptions. Our findings suggest that increased penetration of digital technology results in a higher marginal output in the health sector, thereby fostering the growth of the healthcare industry and enhancing health outcomes. Moreover, we conduct simulations with varying levels of digital penetration, data sharing, and population aging to offer policy implications. It is imperative that governments develop and refine relevant regulatory systems to ensure that while encouraging health data sharing, they also adequately address concerns such as cybersecurity and privacy protection. **Keywords:** digital health, big data, innovation, privacy regulation, growth

Ind-2171 Machine Learning Models For Predicting Hospital Activity: Systematic Review Of Systematic Reviews

PRESENTER: **Daliya Kaskirbayeva**
AUTHOR: Tim Ensor

Background

An increasing amount of published literature has utilized machine learning (ML) methods to predict hospital activity and the quality of hospital services. The aim of this review is to synthesize evidence from available systematic reviews comparing the predictive power of ML models to traditional regression models.

Method

A comprehensive search was conducted to identify all relevant systematic reviews in the databases PubMed, CINAHL, Medline, and Web of Science in August 2024. After removing duplicates, two reviewers independently screened 121 titles for eligibility based on inclusion and exclusion criteria and assessed the quality of the included reviews using the AMSTAR tool. Information was extracted on review characteristics, reported results, input parameters, accuracy metrics, and data sources used in the included studies. The review protocol was registered in PROSPERO (CRD42024593775).

Results

A total of 26 systematic reviews were included in the final analysis, encompassing approximately 200 different studies. According to the AMSTAR tool criteria, most of the reviews were of low quality. While most studies reported a high level of predictive power for ML models, they highlighted challenges related to external validation. The top three predictors across studies were risk scores, insurance type, and demographics. Other commonly used parameters included diagnosis (primary, secondary, and comorbidities), procedure types, physical examination results, admission characteristics (e.g., emergency vs. elective, admission source), hospital characteristics (e.g., rural/urban, teaching vs. non-teaching, public/private, autonomy level, size), healthcare professional characteristics (e.g., years of experience, surgical volume, seniority), medical/clinical notes, and medications.

Conclusion

Machine learning models demonstrate significant predictive power for hospital activity and service quality compared to traditional regression models. However, the lack of external validation remains a critical limitation in the current body of evidence.

Ind-1945 Effects of Electricity Outages on Primary Care Quality: Evidence from a Standardized Patient Audit in South Africa

PRESENTER: **Nicholas Stacey**
AUTHORS: Olukemi Babalola, Duane Blaauw, Mylene Lagarde

Over 540 million individuals in Sub-Saharan Africa use healthcare facilities without a reliable electricity supply. However, at present there is limited evidence on the impact of electricity outages on care quality. Understanding the effects of electricity outages on care provision is key to understanding the returns costly investments in infrastructure may yield. The literature on electricity outages has typically focused on their impacts on outcomes of tertiary care, ignoring primary care despite its acknowledged importance, and generally reports only observed correlations without causal attribution. Moreover, the empirical literature on the determinants of primary care quality has typically downplayed the role of structural inputs (such as electricity supply), and rather emphasized provider competence, training, and incentives. However, this focus may be in part due to challenges in finding credibly exogenous variation in structural inputs. In this paper, we contribute to these literatures by identifying the effect of electricity outages on the quality of care offered by primary care providers in urban South Africa. We use data from standardised patient (SP) visits undertaken at public and private primary care providers in Soweto (Johannesburg, South Africa) during a period of rotational load-shedding. Our empirical approach combines the exogeneity of randomly-assigned SP visits with the exogeneity of the randomly-assigned loadshedding schedule to address demand- and supply-side sources of endogeneity in the relationship between electricity supply and care provision. We find that electricity outages reduce diagnostic effort (the number of relevant questions asked by providers) and find suggestive evidence that outages reduce the likelihood of correct diagnosis and correct management. The findings suggest that the consequences of electricity outages extend beyond the disruption of facility administration and directly impact providers' care process, and patient-provider interactions in the primary care setting. Our findings suggest that electricity supply acts as a complement to provider effort and therefore benefits to investments in electricity supply and resilience may include improvements in care quality via improved provider process.

Ind-1343 Economic Evaluation of Next-Generation Sequencing Technologies in Paediatric Patient Groups With Rare Diseases: a Systematic Review

PRESENTER: **Jean-Pierre Uwitonze**, University of Bern
AUTHORS: Marianna De Stefano, Rudolf van Olden, Elnaz Arjmand, Julian Nam, Lasse de Fries Jensen, Birgit Schäfer, Janbernd Kirschner, Alessandra Ferlini, Rudolf Blankart, Rachel Cassidy

Background: It is estimated that ~72% of rare diseases have a genetic origin, with ~ 70% of these conditions having an exclusive paediatric onset. Next generation sequencing (NGS) technologies can be used for screening and early detection of rare disease, with potential to reduce subsequent morbidity with appropriate timely disease specific management and to help avoid a lengthy diagnostic odyssey for the family. As part of the assessment for adoption of new healthcare technologies, economic evaluations can help to shed light on the expected costs of implementation and benefits to healthcare organisations, payers, patients and society.

Research aim: To identify current evidence on the economic evaluation of NGS technologies for the diagnosis of rare diseases in paediatric populations.

Methods: A search strategy was developed to retrieve relevant literature from the Cochrane Library, EconLit, Embase, Global Health, Medline, Scopus, and Web of Science databases interrogated for relevant literature. Articles were retained if the study described a full economic evaluation on use of NGS technologies for detection of a rare disease in paediatrics, conducted in member states of either the Organisation for Economic Co-operation and Development or the European Union.

Results: Following the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines for conducting and reporting reviews, 24 articles were included in the study. The majority of studies were conducted in healthcare settings in Australia (n=14), with wide variation in study sample size (32 – 1,259 individuals), screened health conditions and model time horizon (3 months to lifetime). Most included studies took a healthcare sector perspective to their economic evaluation (n=16), with the most frequent strategy comparison for the detection of rare disease being whole exome sequencing vs. detection through standard care (n=10). More than half of studies found that NGS dominated the traditional diagnostic pathway (n=14), with less than a third of studies finding NGS to be a more expensive option but proving cost-effective due to a significantly higher diagnostic yield (n=7). Incremental cost-effectiveness ratios were the most reported outcome, with diagnostic yield being the most frequently reported measure of effectiveness (n=23) followed by quality-adjusted life years (n=6).

Conclusion: NGS technologies hold great promise for the early detection of rare disease in paediatric populations, with evidence to suggest that it dominates or is at least cost-effective when compared to standard procedures for detection. A critical area for future research must be to generate further evidence on the cost-effectiveness of the technology for the detection of rare disease in healthy or asymptomatic populations, such as in newborn screening programmes. Future research should also focus on expanding the measures for assessing the effectiveness of NGS (such as the use of quality-adjusted life years to compare strategies) and further adoption of a societal perspective and indirect costs to generate a more accurate picture of the costs and benefits of the new technology.

abs-os131 New Appraisals of Economic Evaluations of Digital Diabetes Health Interventions: International Lessons from Bangladesh.

PRESENTER: **Prof. Louis W Niessen, PhD**
AUTHORS: Carl Asche, Shariful Islam, Kathryn Antioch

Louis Niessen, Carl Asche, Shariful Islam, Kathryn Antioch, et al - This work supports efforts by the Professional Society for Health Economics and Outcomes Research (ISPOR) Consolidated Health Economic Evaluation Reporting Standards for Digital Health Interventions (CHEERS-DHI) Working Group and the Guidelines and Economists Network International (GENI) DHI and Artificial Intelligence (AI) Committee to establish standardized economic evaluation methods for DHI and AI interventions.

****Background**** Mobile phone use (mHealth) increases globally, especially in low- and middle-income countries (LMICs). Mobile phone subscribers in Bangladesh increased from 86.5 million in 2012 to 163.4 million in 2019, reaching all population groups. mHealth interventions

are practical, relatively low-cost approaches to treat chronic disease, including diabetes, depression, heart disease, smoking, and hypertension. A previous randomized controlled trial (RCT) found that a text messaging effectively reduced glycemia in type 2 diabetes (T2D) patients in Bangladesh. Given limited financial resources and the increase in mobile phone use, mHealth is an encouraging technology to alleviate the burden of diabetes and economic costs for health systems, society, and patients. This paper will use and test upcoming CHEERS variations, using this study as an example in LMICs.

Aim To test upcoming appraisal guidance on the cost-utility analysis of an RCT of a mobile phone text messaging program for people with T2D in urban Bangladesh.

Methods A generalised cost-effectiveness analysis of the RCT in Bangladesh. Patients with T2D were randomized (1:1) to a text messaging intervention plus standard care or standard care alone. Intervention participants received a text message daily for 6 months, encouraging EuroQol-5 Dimensions-3 Level (EQ-5D-3L) healthy lifestyles. Costs to users and the systems were measured. The EQ-5D-3L was used to measure improvements in health-related quality-adjusted life years (QALYs). Intervention costs were expressed as average cost-effectiveness ratios (cost-per 1% unit-reduction in glycated haemoglobin A1C (HbA1c) and cost per QALY gained), based on the World Health Organization cost-effectiveness (WHO-CHOICE) method. The upcoming CHEERS-DHI and CHEERS-AI extensions are presented, and their use is reported.

Results Among 236 patients, the adjusted difference in accumulated QALYs between the intervention and control groups over six-months was 0.010, with a 95% CI of 0.000 to 0.021. The intervention, a mobile phone text messaging, incurred an average additional cost of 24 international dollars (Int$) per patient. This resulted in incremental cost-effectiveness ratios (ICERS) of 38 Int$ per 1% reduction in HbA1c and 2,406 Intl. $ per QALY gained. The total cost of implementing the intervention across the cohort was 2,842 Int$. These findings were validated in a multi-country pooled data from 5 trials, including 2,600 patients. The study was compared to the CHEERS recommendations and limitations listed. CHEERS-AI was considered but was not applicable as messages were not AI-generated. CHEERS-DHI is applicable.

Conclusion In a robust evaluation, text messaging is likely a valuable and generalisable addition to standard treatment for diabetes care in LMIC settings. It is predicted to lead to overall savings in health system costs. CHEER-AI is not able to capture the peculiarities of mHealth. Therefore, the CHEERS-DHI under development could help include the most appropriate data in the model and report its results. The limitations of the CHEERS (2022) in addressing DHI interventions are informing the development of CHEERS-DHI. Comparative studies with longer follow-up and larger samples are needed to draw reliable conclusions in various settings, while AI may enhance the impact.

No-conflict-of-interest

3:30 PM –5:00 PM TUESDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Jasmine

Improving Health Care Financing and Organization

MODERATOR: **Mark Akanko Achaw**,

Ind-924 Assessing Contracting-out of Health Care in Afghanistan: Lessons From 20 Years of Evolution Amid Turbulence

PRESENTER: **Sophie Witter**, Queen Margaret University Edinburgh
AUTHORS: Mohammad Mahdi Frough, Jonas Weinert, Marion Jane Cros

Background Since 2002, international donors have played a pivotal role in financing health services and supporting health system development in Afghanistan. The scope of the country's health services is defined by the Basic Package of Health Services (BPHS) and the Essential Package of Hospital Services (EPHS). Significant improvements have been observed in access to key maternal health services, such as antenatal care and institutional deliveries. Currently, BPHS/EPHS are offered nationwide through approximately 2,400 of the 4,200 health facilities. The expansion of service coverage and access has led to notable improvements in health outcomes. However, the contracting model has changed over time, including its approach to and design of results-based financing (RBF) of service providers, while the landscape has also changed considerably, particularly with the return of the Taliban in 2021. In this presentation, we examine the evolution of the contracting model and its approach to RBF, what it has achieved and where there may be gaps, and how it can be strengthened to support service delivery and resilience going forward. **Research question** What lessons can be learned from Afghanistan's two decades of contracting out health services, particularly the design and implementation of RBF component, for Afghanistan and other fragile and conflict-affected settings (FCAS)? **Methods** The study is adopting a retrospective longitudinal case study approach, using mixed methods. These include document review to track the programme's history and earlier evaluation of outputs and key informant interviews to understand the position of actors, the drivers of change in programme design, implementation issues, and the framing of the programme and its results in this challenging context. The quantitative component involves analysis of service delivery and survey data to establish the impact of changing design on health outputs using a controlled interrupted time series with synthetic control augmentation. We estimate a model using multi-level segmented regression techniques to capture both level and slope changes across programme phases and control groups & supplement this with difference in difference analysis. **Results** We find that the RBF model in Afghanistan expanded gradually, evolving to respond to the Afghanistan context and challenges, and that the contracting approach has responded to cycles of violence, including the 2021 Taliban takeover. Some resilience of the system has been built, largely through the role of the non-governmental organizations (NGOs) and their flexibility in using resources, delivering services and managing risks at local level. The program, approach, and RBF model has contributed to increased service coverage and improved health outcomes. However, outstanding challenges include the fragmentation of the health service delivery system in Afghanistan. **Conclusions and**

implications RBF and contracting out can be an effective option in FCAS. The case study brings out specific features of the Afghanistan story but also highlights the importance of understanding the impact on the mid-level organisations, the NGOs. The Afghanistan model and its design features also offer valuable insights on designing provider payment mechanisms within the context of the humanitarian-development nexus.

Ind-1415 The Impact of Market-Based Medicaid Reforms on Health Access and Preventive Care in the U.S.

PRESENTER: **Kevin Griffith**, Vanderbilt University
AUTHORS: Robert Skinner, Colleen Florio, Christopher Louis

Research Objective: This study examines a unique Medicaid expansion program in the U.S. state of Arkansas, which adopted distinctive policies to expand healthcare access for low-income adults. These policies included subsidies to help people buy private insurance plans, temporary work requirements, and requirements for premium payments. We analyzed changes in self-reported healthcare access and preventive service use in Arkansas following these policy changes. We also compared Arkansas' results to those in other U.S. states that expanded Medicaid using more traditional approaches.

Study Design: We assessed the effects of Arkansas' Medicaid waiver on four self-reported measures of access to care and preventive service utilization. These included whether the respondent:

- Had insurance coverage
- Had a personal healthcare provider
- Avoided care due to cost in the previous 12 months
- Received a routine checkup in the past 12-months

Study covariates included respondent age, education, sex, employment, household size, veteran status, homeownership, survey month, and whether the survey was conducted via landline or cell phone. We estimated interrupted time series and difference-in-difference models to compare changes in Arkansas and control states from the baseline period (2011-2013) through an 'early expansion' period (2014-2016) and a 'late expansion' period (2017-2021). All regressions were estimated as covariate-adjusted linear probability models using BRFSS sampling weights with standard errors clustered at the state level.

Population Studied: Our study used data from a nationwide survey, the Behavioral Risk Factor Surveillance System (BRFSS), focusing on U.S. adults aged 18–64 with low household incomes (below 138% of the federal poverty level).

Principal Findings: Medicaid expansion was associated with large increases in health insurance coverage (+26.2 percentage points, 95% CI:24.0,28.6), having a personal doctor (+8.8pp, 95% CI:-4.3,13.3), routine checkups (+20.2pp, 95% CI:15.3,25.1), and decreases in avoided care due to cost (-15.7pp, 95% CI:-20.4,- 10.9) among Arkansas residents. Most of these changes occurred during the early expansion period, with smaller improvements observed during the late expansion period. In DID models comparing Arkansas to traditional Medicaid expansions, Arkansas' waiver expansion was associated with an additional +13.1pp in insurance coverage (95% CI:5.6,20.6), +4.9pp in having a personal doctor (95% CI:0.9,8.8), and +9.6pp in receipt of a routine checkup (95% CI:3.9,15.2). Rates of avoided care due to cost were similar between the two groups. These results were robust to the removal of 2020 data due to the potential complicating effects of the COVID-19 pandemic.

Conclusions: Arkansas experienced large and durable increases in access to care and preventive service utilization in the eight years following their initial expansion in 2014. These gains were larger among Arkansas residents compared to residents in states that underwent traditional Medicaid expansion. Taken together, our results suggest that state approaches to Medicaid expansion that leverage market-driven options are a viable alternative to improve access to care. Arkansas' market-driven approach may be more attractive to conservative policymakers compared to traditional state Medicaid expansions.

Ind-1696 Healthcare Resource Allocation: Policy Failures and Corrective Measures in Japan

PRESENTER: **Haruko Noguchi**, Waseda University
AUTHORS: Shiko Maruyama, Shun Takagi, Sayaka Nakamura

1. **Background**

Extensive research has examined the impact of pricing policies on patients' incentives and behavior, frequently utilizing variations in co-payment ratios as exogenous shocks. However, limited attention has been given to how pricing policies influence the economic incentives of healthcare providers, despite their critical role in signaling resource allocation needs. Globally, this research gap stems partly from the difficulty in identifying uncontaminated causal relationships, as the universal nature of price regulations and payment system changes complicates the establishment of unaffected control groups. This challenge remains a significant barrier to fully evaluating the impact of pricing policies in the context of universal health coverage (UHC).

1. **Objective**

This study seeks to address the gap in understanding the effects of pricing policies on healthcare providers by analyzing the persistent excess supply and misallocation of acute care hospital beds in Japan. Specifically, it investigates the consequences of the 2006 revision of the fee-for-service (FFS) system and evaluates the impact of the FY 2018 FFS revision implemented in April. Due to the uniform and simultaneous application of the FFS revision nationwide, identifying control groups for comparison before and after the revision poses a methodological challenge.

1. **Methods**

The study applies a regression discontinuity design (RDD), using time as the running variable, to administrative data with a time-series structure. The dataset comprises monthly medical claims from all insured individuals and their dependent family members registered with the Japan Health Insurance Association (JHIA), commonly referred to as “Kyokai Kenpo” in Japanese. JHIA primarily enrolls employees of small- and medium-sized companies and their dependents. As of 2022, JHIA covers 40.296 million enrollees, representing 32% of Japan's total population, making it the second largest insurance association after the National Health Insurance (NHI). The analysis focuses on key indicators, including the number of facilities with acute care functions, patient volumes, total medical care costs, average length of hospital stays, and per-day medical costs.

1. **Results**

The 2018 revision led to: (1) a reduction of approximately 100 acute care facilities, including those with 7:1 beds, across Japan; (2) a decrease in the number of patients (by about 2.6 patients per facility) and total medical care costs (by 11%): (3) an increase in the average length of hospital stays (by approximately 0.3 days); (4) an increase in per-day medical costs (by approximately 6.3%). These changes suggest a shift toward more intensive care in acute-stage functions, consistent with policy objectives.

1. **Conclusion**

This study highlights how government misestimations of supply-side price elasticity contributed to the misallocation of acute care resources, a form of government failure. The 2018 FFS revision partially addressed these issues, realigning resource allocation with policy objectives by reducing excess supply and promoting care intensity. The findings emphasize the necessity for policymakers to better anticipate healthcare provider responses to pricing policy changes to mitigate future misallocations effectively.

Ind-2268 Implementation Experiences with Cuban Health Cooperation Programs in Low-and Middle-Income Countries

PRESENTER: **Faith Njiriri**

AUTHORS: Benjamin Tsofa, Moriasi Nyanchoka, Jacinta Nzinga

Background: Health systems in low-and middle-income countries (LMICs) face chronic Human Resources for Health (HRH) shortages. This is especially worse in rural and primary healthcare settings. The Cuban government since 1960s has been implementing a policy strategy for producing a health workforce for export, to boost their economy. Several LMICs have since established health cooperation programs with Cuba to import health workers to address their shortages. This review aimed to examine the emergence, design, utility, outcomes, and lessons learned from the implementation of these programs.**Methods:** We conducted a scoping review using the Joanna Briggs Institute (JBI) methodology and searched for literature across four databases. Two independent reviewers screened the articles and selected relevant articles based on pre-defined criteria. We extracted data and synthesised findings using thematic analysis. **Results:** We included 71 articles after screening 3509 articles. Cuban health cooperation programs have been implemented in many LMICs in South America, Africa, Southeast Asia, and Pacific region. These programs are formalised primarily through bilateral agreements and implemented as exchange initiatives. This involves importing Cuban healthcare workers and sending collaborating country students to study in Cuba. These programs aimed to address HRH shortages and maldistribution, inadequate training capacity, and respond to medical emergencies in the host countries. Cuban healthcare workers, primarily family physicians, within the host countries; are deployed in primary healthcare settings, increasing rural health workforce, and improving healthcare access and outcomes. These programs have faced several challenges including opposition from local medical professionals, underutilisation due to poorly coordinated recruitment, and language barrier. **Discussion:** Cuban health cooperations in LMICs have shown diverse results based on their designs and structures. Long-term comprehensive programs have proven to be more successful in boosting the healthcare workforce and enhancing health outcomes. Key factors for optimising HRH health cooperation include effective collaborative decision-making and need-based deployment.

Ind-2330 Stormborn: Evaluating The Impact of Facility-Based Delivery on Health And Economic Outcomes Using a Machine Learning Approach

PRESENTER: **Prof. Zoe McLaren, Ph.D.**, University of Maryland Baltimore County

Objective

There is broad consensus about the importance of early life investments in improving health and economic outcomes later in life. Encouraging women to give birth in health facilities rather than at home therefore remains a key policy objective in low- and middle-income countries where less than 75 percent of births occur in health facilities. Despite this focus, there is little unconfounded evidence on whether facility-based delivery improves child health and economic outcomes relative to delivering at home. This paper uses a rigorous instrumental variables approach with a machine learning component to examine the impact of facility-based delivery on child outcomes in Africa, including spillovers between siblings.

Literature Review

Only a few studies used a rigorous research design and econometric methods to identify plausibly causal estimates of the impact of facility-based delivery on child, mother and household outcomes. The conclusions are mixed, however. This suggests that an understanding of longer-run and spillover impacts of facility-based delivery is essential to determine its true impact and properly inform policy.

Data and Methods

I use rich data from the Demographic and Health Surveys from 2012 to 2019 for 18 Sub-Saharan African countries that includes women's detailed birth histories (including day of birth), household characteristics and geographic data (including GPS locations). I link births with high-

resolution, high-frequency weather data in the days preceding birth using the Copernicus Climate Data Store ERA5-Land database, which provides data for points on a grid of approximately 6.8-mile squares.

My identification strategy uses exogenous weather shocks such as rain and high temperatures in the week before birth as instrumental variables for facility-based delivery since they may hinder travel and induce women who considered delivering in a health facility to instead deliver at home. I exclude births occurring in the days following extreme weather shocks like flooding because they likely violate the exclusion restriction by influencing outcomes directly rather than via the likelihood of facility-based delivery. I use machine learning methods (lasso, ridge regression and elastic net) to select the strongest set of instruments from a large set of 400 potential instruments for facility-based delivery.

Results

Results from the elastic net instrumental variables estimation show that facility-based delivery is statistically significantly associated with a 7.8 percentage point increase in under-five survival, a 26.5 point increase in the height-for-age percentile, an 19.4 point increase in the weight-for-age percentile, and a 4.5 month shorter subsequent birth interval relative to children who were delivered at home. I found a large positive spillover effect of having an elder sibling deliver in a health facility on the likelihood of receiving at least one vaccination. There were no spillover effects on any outcomes from having a younger sibling delivered in a health facility.

Discussion

The instrumental variables approach identifies large benefits of facility-based delivery that accrue to women who are dissuaded from traveling to a health facility by relatively small, potentially surmountable barriers. There is therefore a need for better policies to encourage, incentivize and enable facility-based delivery for this group.

Ind-2658 Cost-Effective Approaches to PHC Transformation: Contextual Models for Indonesia

PRESENTER: **Ulfathea Mulyadita**

Background

Indonesia is transforming how primary health care (PHC) is delivered, integrating healthcare from the sub-district level (via PHC facilities called Puskesmas) down to the hamlet and household level. This reform, referred to as PHC Integration (or ILP), mandates that each village across Indonesia must have a model Auxiliary Puskesmas (Pustu), staffed with one nurse and one midwife. Given that Indonesia has over 80,000 villages, nationwide implementation would incur significant costs. Instead of one homogenous model, we proposed alternative models for this reform, considering village population and the distance to nearest health facility. Besides the potential cost savings, we argue that the adoption of this alternative model could facilitate the widespread implementation of ILP by subnational governments, as they can be tailored to accommodate the varying capacities and unique factors of each district.

Methodology

The study uses a mixed-method approach, first with focus-group discussions with experts to define alternative models of Pustus. Second, using the average cost of running a Pustu after ILP is implemented (from a previous study), we conducted a cost estimation analysis to determine the potential savings offered by the alternative models. A total of 79,996 villages were analyzed.

Result

The alternative ILP models encompass a range of approaches: the first model closely adheres to the GOI's existing guidelines, the second model reduces the required number of health workers to only one rather than two, the third model utilizes the availability of family doctor clinics in the area, and the fourth model is applied for villages unable to meet the operational criteria and would be integrated with the nearest Pustu. Our estimation found that employing these alternative models could yield approximately 30% in annual operational cost savings, reducing expenses from $634,680,975 to $435,052,074 at the national level. The significant savings are a result of distributing Pustu across the four proposed models as follows: the first model covers 14,876 villages (19%), the second model covers 48,623 (61%), the third model covers 7,866 (10%), and the fourth model covers 8,631 (11%).

Conclusion

Our research highlights the potential cost savings associated with implementing alternative Pustu models that better account for the unique contexts of villages across Indonesia. The results prompted the GOI to tailor ILP guidelines to accommodate local capacities, health determinants, and local health demand.

Ind-2760 Assessing Demand, Feasibility, and Development Strategies for EPI Vaccine Management and Financing for Myanmar Migrant Children along Thai Border

PRESENTER: **Wasin Laohavinij**, Chulalongkorn University

AUTHORS: Piya Hanvoravongchai, Natthawut Iangtanarat, Nyein Chan Oo

The Thai-Myanmar border, a 2,400-kilometer migration corridor and the largest in Southeast Asia, is also among the 20 largest globally, presenting significant public health challenges due to high population mobility and resource constraints. Approximately one million displaced individuals reside in Myanmar's southeastern region near Thai border. Around 1.5 million Myanmar nationals crossed into Thailand between

January 2023 and February 2024, sixty percent of whom lack documentation. Vaccination coverage among displaced Myanmar children along Thai border has been very low. A recent study on immunization coverage in an ethnic state along Thai border shows nearly 80 percent of children (median age 5 years old) never had a single dose of vaccine. Vaccination coverage for migrant children in Thailand is also very low compared to Thai children, estimated to be below 30%. Initial consultations with Thai and Myanmar stakeholders identified immunization as a public health priority. Lack of vaccination is a deprivation of the right of children to be protected from infectious diseases that can save their lives. It also poses risks to national and regional health security. This study evaluates the demand, feasibility, and strategies for financing equitable Expanded Program on Immunization (EPI) coverage for children aged 0–18 years in five Thai-Myanar border provinces. The research integrates literature reviews, stakeholder consultations, and field data collection. Given the dynamic, mobile and undocumented nature of significant number of Myanmar migrant workers in Thailand, estimating the population size and distribution of children eligible for EPI is not a simple task. Quantitative analyses will estimate vaccine demand using secondary data for demand modelling taking into consideration migrant population distribution, documented and undocumented migratory practice, fertility rate, and dynamic cross-border movements. Qualitative interviews and stakeholder workshops will explore logistical, financial, and systemic barriers. Comparisons with global examples, including conflict-affected settings like Syria and Yemen, provide valuable insights into sustainable immunization approaches. Preliminary findings highlight the need for robust financial mechanisms to support vaccine access for stateless and migrant children. Barriers include resource limitations, administrative hurdles, and inadequate infrastructure. Transient populations and cultural diversity further exacerbate inequities. Thailand's universal health coverage policy does not adequately address non-Thai populations, leaving critical gaps in health equity and security. The project is expected to complete by September-2025, with the aim to generate actionable policy recommendations to improve immunization coverage, mitigate transboundary health risks, and strengthen health systems.

Ind-2810 The Impact of the Medicare Shared Savings Program on Fall Prevention and Fall-Related Injuries Among Older Adults

PRESENTER: **Courtney Baird**, Brown University
AUTHORS: Elizabeth Goldberg, Pedro Gozalo, Andrew Ryan, Sarah Berry

Background:

To address perverse incentives within the U.S. fee-for-service payment system, the 2010 Affordable Care Act (ACA) established a wide range of alternative payment models in which providers are reimbursed or penalized based on cost-efficiency, process quality, and health outcomes. One of the largest alternative payment models that was created by the ACA is the Accountable Care Organization (ACO), launched through the Medicare Shared Savings Program (MSSP) in 2012. Existing evaluations of MSSP ACOs provide early evidence that the program may be effective at improving processes of care and clinical outcomes for a few conditions. However, no research studies have evaluated the impact of MSSP ACOs on the quality of care for older adults who are at risk of falls.

Research Question:

The purpose of this study is to evaluate whether Medicare patients who receive care from MSSP ACOs have a higher rate of fall prevention screenings and lower rates of falls as compared to Medicare patients who are not treated by MSSP ACOs.

Methods:

The study population included all traditional Medicare patients aged 65 years and older. We used a 20% random sample of national Medicare claims from 2010-2020 and the appropriate diagnosis and procedure codes to construct the following outcome variables: (1) screening for osteoporosis; (2) screening for future fall risk; and (3) fall-related inpatient/hospital admissions. Attribution to an MSSP ACO was based on the Tax Identification Number that provided the plurality of allowed charges for CMS-qualified primary care services, according to the attribution methodology published by CMS. We employed a difference-in-differences research design with year and Hospital Referral Region fixed effects and robust standard errors. Subgroup analyses were conducted to evaluate whether the observed treatment effects varied by age, sex, and the patient's predicted baseline level of fall risk.

Results:

Among the full sample, the change in the mean percentage of beneficiaries screened for fall risk in the ACO group was 4.43 percentage points higher than the corresponding change in the non-ACO group ($p=0.000$), representing a 42% increase from the average screening rate. These results were statistically significant among all subgroups. The change in the mean percentage of beneficiaries screened for osteoporosis in the ACO group was 0.57 percentage points higher than the corresponding change in the non-ACO group ($p=0.000$), representing a 5% increase from the average screening rate. These results were statistically significant among all subgroups except for males and were of the greatest magnitude among females ($q=1.07pp;p=0.000$). The change in the fall-related inpatient admission rate in the ACO group was 0.09 percentage points lower than the corresponding change in the non-ACO group ($p=0.023$), representing a 5% decrease from the average admission rate. These results were statistically significant among all subgroups and were of the greatest magnitude among the high fall risk group ($q=0.303pp;p=0.000$).

Conclusions:

The results of this study suggest that the MSSP may be an effective policy for incentivizing providers to comply with clinical guidelines for the prevention of falls, as reflected by higher screening rates and lower fall-related admission rates among MSSP-attributed beneficiaries.

Ind-1518 Value Based Health Care (VBHC) for the Elderly: Addressing Challenges during the Pandemic Using Multi-Criteria Decision Analysis

PRESENTER: **Kathryn Antioch**, Monash University
AUTHORS: John Pilla, Angeline Kuek, Rick Marshall

BACKGROUND

This is Stage-2 of a larger study mitigating global pandemic impacts on Value-Based-Health-Care by prioritizing economic policies using Multi-Criteria-Decision-Analysis (MCDA).

AIM

To investigate global challenges in VBHC for the elderly in aged-care, community and hospitals during the pandemic and identify remedial public-health and economic-policies.

METHODS

Preferred Reporting Items for Systematic reviews and Meta Analyses extension for Scoping-Reviews (PRISMA-ScR), PUBMED, Medline, google-scholar (1991 to 2024) analysed pandemic impacts on VBHC. MCDA prioritized economic-policies, utilizing the value-measurement model with additive-weighted scores. The criteria-weighting-method used direct-rating and ranking to priority rank economic policies for each VBHC domain.

RESULTS

All VBHC domains were impacted by the pandemic, including VBR; cost/outcome data; information-technology and artificial-intelligence; VBHC enabling policy/institutions; Regional-Systems-Integration; Geography-of -Care, and Integrated-Care.

Value-Based-Reimbursement, VBHC enabling policy/institutions, Regional-System-Integration

There is inequity across USA Medicare value-based payment programs. Affordable-Care Act (2010) and Medicare-Access and CHIP-Reauthorization Act (2015) inaugurated a Medicare value-based-payment-programs era. However, five mandatory pay-for-performance programs are inequitable and financially penalize systems with safety-net and ethnic-minority patients. Payments from penalized systems are often redistributed to better financed holders of higher performance-scores treating less vulnerable patients, creating "Reverse-Robin-Hood" effects. Payment-adjustments for social-risk factors and unmet needs could mitigate inequity by peer-grouping to stratify healthcare systems by proportion of dual-eligible Medicare/Medicaid patients served, performance evaluation and payment-adjustments within strata. Census-based, area-level indices could identify neighbourhood-level social-risk using socioeconomic data, and Social-risk best-practice, health-equity measures, and policies integrating healthcare and social services (Chen et al 2022). Liao (2020) found negative impacts on health care disparities for Medicare's Alternative-Payment-Models for population-based and episode-based payment-models.

Other VBR studies concerned healthcare-performance and/or payments for dementia, rhinology, otolaryngology, arthroplasty, sepsis, pneumonia, ophthalmology, neurosurgery.

Outcome/cost data

Self-reported elderly health parameters and quality-indicators of primary-care provider engagement in nursing homes. Home-based palliative-care program costs were analysed to improve value for frail elderly.

Frailty Indexes: A frailty-index based on Australian-Aged-Care-Assessment-Program-data; Canadian elderly frailty and QoL measures to predict death, nursing-home transfer, and hospitalisation; and baseline-frailty as a predictor of survival post-critical elderly care receiving Canadian home-care. Frailty-Screening-Questionnaire (FSQ) predicted 8-year mortality in Chinese elderly. Hospital frailty risk-scores were validated in a Swiss tertiary-hospital. Frailty-based prognostic criteria in heart-failure patients (FLAGSHIP) were developed. Frailty instruments in noncardiac surgery were compared. Frailty/comorbidity impacts on dementia institutionalization/mortality and a tool for early elderly frailty-identification in primary-care were assessed.

Integrated-care and Geography-of-Care

MCDA evaluated value-based person-centred integrated care for frail-elderly at home in Europe and an integrated care-pathway for frail elderly patients in Norway. The Danish frailty and aging health-care system holds global lessons. Evidence-base of integrated-care for multi-morbidity patients in Europe was strengthened using MCDA.

Information-Technology and AI

Online-resources for carers of frail-elderly were identified in Europe. Optimized-Geriatric-Pharmacotherapy-through-Pharmacoepidemiology-Network (OPPEN) involves frail-elderly medication, clinical-practice/research consensus principles. Frailty-assessment in primary-care compared electronic frailty-index versus frailty-coding. Elderly hospital-frailty-risk scores in acute-care use electronic-hospital-records. Heart-failure outcomes were assessed using claims-based Frailty-Index. Telemedicine in inflammatory-bowel-disease through telephone/videoconferencing is promising.

CONCLUSION

MCDA prioritized economic-policy involving economic-sustainability, healthcare-system performance, determinants-of-health, risk-adjusted costs/health data, planning and market mechanisms, demand/supply of healthcare, economic-evaluation of healthcare.

3:30 PM –5:00 PM TUESDAY [Health Beyond The Health System]

Bali International Convention Centre – Medan

Risky Health Behaviors and Interventions

MODERATOR: **Ana Correa Ossa**,

Ind-444 The Impacts of Cigarette Prices on Adult Smoking Cessation in Indonesia

PRESENTER: **Fariza Zahra Kamilah**, Center for Indonesia's Strategic Development Initiatives
AUTHOR: Muhammad Zulfiqar Firdaus

Background: The cigarette excise tax rate in Indonesia remains among the lowest in the world, and the country faces significant challenges and complexities in its tobacco control efforts. Studies have shown that an increase in cigarette prices can reduce smoking prevalence through behavioral changes such as cessation. Nevertheless, the evidence on how the increase in cigarette prices can affect smoking cessation in Indonesia is very limited. **Objective:** This study seeks to understand the impact of cigarette price increases resulting from tax increases during 1998-2021 in influencing smoking cessation behavior among adult smokers in Indonesia. **Method:** In estimating the impact of cigarette prices on smoking cessation, this study uses duration analysis by constructing a pseudo-panel data set using Indonesia's Global Adult Tobacco Survey (GATS) 2021 and cigarette price data obtained from the National Consumer Price of Selected Goods and Services released by Statistics Indonesia (*Badan Pusat Statistik*). **Findings:** The cigarette price increases are associated with a higher probability of cessation among adult smokers (with a price elasticity of cessation of 0.017 among males and 0.013 among both genders). Comparing the results with other upper-middle-income countries, the impact of price on cessation in Indonesia is lower considering the affordability factor and the availability of alternatives for switching when a particular type or brand of cigarette price increases as a result of a higher tax **Conclusion and study implication:** This study adds to the global evidence on the impact of higher cigarette prices on smoking cessation behavior, as well as country-specific context (Indonesia), where the impact of cigarette price increases on cessation has not been evaluated. This study highlights the need for a more effective tobacco control policy, particularly increasing the cigarette tax by a higher margin, minimizing the availability of cheaper cigarettes, banning the sale of single-stick cigarettes, and combating the illicit cigarette trade. .

Ind-912 Spillover Effects of Work Fatigue on Unsafe Driving During Commutes Among Healthcare Workers: Behavioral and Policy Insights from a Multi-Method Study

PRESENTER: **Khairil Idham Ismail**
AUTHORS: Hanizah Mohd Yusoff, Rosnah Ismail, Nor Kamaliana Khamis

Background and Aim: Commuting accidents (CAs) among healthcare workers (HCWs) disrupt healthcare delivery, strain workforce sustainability, and impose economic burdens on health systems through productivity losses and service inefficiencies. Work fatigue, a critical factor in unsafe driving behaviors, often spills over from work and off-work demands, extending its impact beyond the workplace. Despite this, the mechanisms driving these spillover effects remain insufficiently explored. This study aimed to develop a validated tool for assessing unsafe driving behaviors and examine the spillover effects of work fatigue on commuting safety, focusing on mitigating factors like sleep and detachment and implications for health system efficiency and policy. **Methods:** The study was conducted in two phases. Phase 1 involved the development of the *MyUDWC* scale incorporating expert input via a nominal group technique (NGT) with 15 experts, cognitive debriefing with 6 HCWs, exploratory factor analysis (EFA) with 135 HCWs to examine the scale's structure, and confirmatory factor analysis (CFA) with 307 HCWs to evaluate model fit and psychometric properties. Phase 2 consisted of two field studies. **Phase 2a** utilized a *shortitudinal* study design to explore relationships between work demands, off-work demands, persistent fatigue, and daily unsafe driving during commutes. Over 5–7 consecutive days, 172 participants provided 976 diary entries across three daily points (T1–T3). Multilevel modeling through Hierarchical Linear Modeling (HLM) and Monte-Carlo simulations assessed mediation (2–1–1) and moderated mediation effects, controlling for factors like age, gender, number of children, commuting impedance, and within-person demand variations. **Phase 2b** employed a driving simulator study involving 30 HCWs, a cohort from the shortitudinal study, assessed across three waves (baseline, post-shift, pre-shift). Driving performance metrics were analyzed using a Generalized Linear Mixed Model (GLMM) to identify predictors of performance changes. **Results:** The *MyUDWC* scale was validated as a 20-item instrument with six domains, demonstrating strong psychometric properties ($CR > 0.8$; $AVE > 0.5$; $\chi 2/df = 2.47$; $RMSEA = 0.06$; $CFI = 0.95$; $TLI = 0.94$; $HTMT \leq 0.9$). The shortitudinal study revealed that persistent work fatigue mediated the spillover effects of work demands → daily unsafe driving (*95% CI = 0.0001, 0.011*) and off-work demands → daily unsafe driving (*95% CI = 0.0001, 0.012*), while sleep duration moderated these effects, reducing their impact (*95% CI = -0.075, -0.001; -0.074, -0.008*). The driving simulator study identified speed variability as the best-fit predictor of unsafe driving through the GLMM (*AIC = 1786.26; BIC = 1790.80; -2loglikelihood = 1784.25*), with significant predictors including unsafe driving behavior ($F(1,699) = 3.822$, $p = 0.04$), persistent fatigue ($F(1,699) = 5.949$, $p = 0.015$), and lack of detachment ($F(1,699) = 14.00$, $p < 0.001$). Persistent fatigue consistently influenced changes in driving performance across all tested models. **Conclusions and Implications**: This study highlights the spillover effects of work fatigue on commuting safety, with implications for workforce sustainability and health system efficiency. Findings support policy interventions like fatigue management programs and shift schedule adjustments to mitigate commuting risks. Addressing unsafe driving behaviors enhances worker safety, lowers economic costs, and promotes sustainable healthcare policies.

Ind-942 15 Years of TV-Advertising for Unhealthy Foods Aimed at Children in Germany

PRESENTER: **Tobias Effertz**, Universitaet Hamburg

Abstract

Introduction: Approximately 15% of German children are either overweight or obese. Still being an essential part of the industry´s media mix in Germany the TV advertising of unhealthy foods remains as a contributing factor to the obesogenic environment. Research suggests that children react towards adverts for unhealthy foods by impulsive purchases, overeating, worse nutritional knowledge and preferences formation in favor of unhealthy food choices.

Method: This analysis aims to show the extent of unhealthy food ads children in Germany are exposed to over a larger time span from 2007 to 2023. Especially trends in the design, placement and frequency of advertisements for unhealthy foods are examined. For the analysis German TV channels were recorded and their content documented over a time period from December 2007 to April 2023 with a total of 57,678 recorded and documented advertisements. Advertised foods were classified as either unhealthy or healthy and hence unsuitable or suitable for being aimed at children according to the WHO Nutrient Profile Model for Europe. Additionally, the advertised foods were categorized as being a high-palatable-, energy-dense- or ultra-processed food whenever the food either contained certain ingredients like stabilizers, emulsifiers or preservatives or thresholds of macronutrients were exceeded. The three chosen food categories are under ongoing examination as potentially causal factors for ad libitum overeating and obesity development. Furthermore, the marketing techniques of celebrity endorsements, cartoon characters and premiums within the advertisements, which likely attract children, were also documented. The data was further merged with information on children´s viewing times in Germany to identify children´s peak viewing times, i.e. time slots during the day in which children most likely watch TV. Descriptive statistics and test were done to demonstrate developments and identify significant trends.

Results: The results show a robust pattern of children´s exposure of unhealthy food advertising over time. Within the study period from 2007 to 2023 the relative amount of unhealthy food advertisements varied from 17.23 % to 20.1 % of all advertisements. Among all food ads the proportion of unhealthy food according to the WHO Nutrient Profile Model rose from 87% in 2007 up to 97% in 2023. Children watching TV saw on average 10.1 advertisements for unhealthy foods per day with a slight increase over time from 9.5 ads in 2007 to 10.3 in 2023 despite a decreasing time of watching TV over the years. A Chi2-Test revealed that unhealthy food as well as all three food categories were more likely to be advertised using a celebrity, a cartoon character and a premium. The usage of these techniques among the food categories significantly increased over time.

Discussion: The analysis shows that besides the internet and social media, TV advertising for unhealthy foods aimed at children is still a risk factor for public health in Germany.

Ind-1554 Initial Winning of Tobacco Taxation as a Tool for Reducing Smoking: Lessons from Indonesia

PRESENTER: **Nina Samidi**
AUTHORS: Hasbullah Thabrany, Risky Kusuma Hartono

Introduction Indonesia has one of the highest smoking prevalence rates globally, with over 70% of adult men being regular smokers. One major contributor to this high rate is the affordability of cigarettes. Over the past decade, the government has raised tobacco excise taxes by an average of 10-12% annually, yet smoking prevalence has barely decreased. In 2010, Indonesia applied up to 19 tobacco tax tiers, which allowed smokers to shift to cheaper products. Efforts to simplify these tiers reduced them to eight by 2024, but smoking prevalence has remained relatively unchanged. This study examines the effectiveness of Indonesia's tobacco tax policies in reducing cigarette consumption from 2013 to 2023. **Methods** The study utilized secondary data from the 2023 Indonesian Health Survey, which covered 1.2 million respondents of 315.646 households, to assess smoking prevalence. Fiscal data on tobacco tax monitoring from the Ministry of Finance was also analyzed. Econometric analysis was employed to compare trends of smoking, taxes, and affordability from 2013 to 2023. **Results** Between 2013 and 2023, government revenues from tobacco excise grew by an average of 6.5% annually, except in 2023, when revenues declined by 2.3% due to stricter consumption controls. A notable excise increase of 23.2% in 2020 reduced cigarette production by 9.7%, demonstrating the effectiveness of price measures. Conversely, in 2019, when no tax increase was enforced, cigarette production surged by 7.4%, reaching 356.54 billion sticks. Affordability indices for tobacco products fluctuated between 10% and 11% from 2010 to 2015 and averaged 14% from 2016 to 2024. Significant increases in affordability indices occurred in 2016 and 2023, coinciding with excise hikes of 15.7% and 23%, respectively. While tobacco tax policies have reduced smoking prevalence among certain groups, the overall impact has been limited. Child smoking prevalence declined from 9.1% in 2018 to 7.4% in 2023, but adult smoking prevalence remained high and stagnant at 31% of the total population in 2023. While consistent excise revenue growth reflects the dual potential of reducing cigarette consumption and increasing fiscal contributions, the current excise hikes have not significantly altered adult smoking behavior. Higher and more significant annual excise increases, alongside complementary fiscal policies such as setting a minimum retail price, narrowing the gap between excise rates and retail prices, and further simplifying tax tiers, are needed to prevent more children from starting to smoke. **Conclusion** Indonesia's tobacco tax policies are working with modest impacts on cigarette consumption. Although excises increased annually, the growths of income have maintained high affordability resulting in slow progress in tobacco control. We recommend more progressive excise policies to effectively reduce cigarette consumption across all groups. Consistent, measurable tax increases, complemented by supporting regulations, are essential to further lower smoking prevalence, particularly among vulnerable groups.

Ind-443 The Health and Economic Impacts of Sugar-sweetened Beverages Tax on Type 2 Diabetes Mellitus Burden in Indonesia

PRESENTER: **Muhammad Zulfiqar Firdaus**

Background: Studies have shown that excise taxes on SSBs increase the price and, when effective, decrease SSB consumption potentially

reducing the future burden of NCDs in a country. Indonesia's high consumption of SSBs, as well as a growing obesity and diabetes rate, have raised concern that the country's economy and health system are at risk of being substantially burdened in the next couple of years. This indicates that taxing SSBs could potentially benefit the country. **Objective:** As the SSS tax has not been implemented in Indonesia and the evidence on the potential impacts of SSB tax in the country has not been widely studied, this study aims to estimate the health and economic impacts of a 20% increase in SSB prices (a proxy for an SSB tax) on the future burden of type 2 diabetes mellitus (T2DM) in Indonesia **Method:** This study uses a modeling approach to estimate the impact of a 20% increase in the price of SSBs, on average, on the changes in T2DM incidence and premature mortality among adults (age ≥ 20 years old) over the period of 2024 to 2033, assuming tax implementation in 2024. The model's main inputs were Indonesia's Basic Research (RISKESDAS) survey data from 2018 and SSB price elasticity computed for Indonesia **Findings:** SSB taxes equivalent to a 20% increase in price could prevent 756,103 cases of overweight and obesity within one year, could avert 3,095,643 cases of T2DM, and could prevent 455,310 deaths over 10 years. Furthermore, over the same period, the tax could avert 268,080 Disability-Adjusted Life Years (DALYs) and could help the country save up to IDR 40.6 trillion (or approximately US$ 2.5 billion) due to a reduction in direct and indirect economic losses associated with T2DM. **Conclusion and study implication:** SSB taxes can contribute significantly to reduce the national burden of T2DM in Indonesia. It can also help the country to achieve its national long-term goals of "The Golden Indonesia 2045 Vision" set by the government, and support the realization of good health and well-being as articulated in the Sustainable Development Goals (SDGs).

Ind-1561 Priority-setting Alcohol Harm Reduction Policies: A Participatory Approach to Assess the Cost-effectiveness of Prioritised Policy Options

PRESENTER: **Ms. Jaithri Ananthapavan**, Deakin University
AUTHORS: Mary Rose Angeles, Mishel Shahid, Leopold Aminde, Amila Suranga Malawige, Mary Wanjau, Mr. Lennert Veerman, Moosa Al Subhi, Linda Cobiac, Phuong Nguyen

Background: Alcohol is a harmful substance that is causally linked to 29 acute and chronic conditions. Economic evidence for policy action to reduce alcohol-related harms at the population level has been identified as a key priority to support Australian government decision-making. There are varied policies that can be implemented by Australian state and Federal governments depending on their jurisdictional powers and political context. The aim of this study was to assess the cost-effectiveness of 5 prioritised alcohol harm reduction interventions in Australia that are most relevant to state and Federal governments. **Methods:** The Assessing Cost-Effectiveness (ACE) priority setting approach was used to engage state and Federal government policymakers, non-government organisations (NGOs) and academic experts (project advisory group). The study included the following steps: 1. Review of national and international alcohol harm reduction policy documents to develop a list of potential policy options for the Australian context 1. Desk review to assess effectiveness, cost-effectiveness, equity impact and population reach of all interventions 1. Workshop 1 with project advisory group to present desk review findings. During this session participants ranked interventions to identify the top 5 priority interventions for cost-effectiveness analyses 1. Develop a of a state-of-the-art Markov model to assess the long-term health and economic impact of population level alcohol-harm reduction interventions 1. Develop policy briefs for each of the 5 prioritised interventions and circulate to workshop participants via email to define the 5 policies for economic analysis 1. Undertake cost-effectiveness analyses of prioritised policies 1. Workshop 2 with project advisory group to present preliminary findings and refine evaluation assumptions. 1. Complete economic analysis and disseminate findings **Results:** Eighteen advisory group members (11 policy makers across five Australian health departments, five NGOs, and two academics) attended the two workshops. Of the 12 policy interventions presented at Workshop 1 across the alcohol policy domains of Availability, Pricing, Promotion and Healthier communities, the following were prioritised for full economic evaluation (from highest to lowest priority): 1. Regulation of alcohol advertising; 2. Restricting the concentration of licensed premises; 3. Introduction of a minimum unit price for alcoholic products; 4. Options to increase taxation; and 5. Reducing hours of sales/ lockout laws/retail restrictions. There was limited support for the following policies: 1. Changing the minimum purchase age/legal drinking age; 2. Selling through Government monopolies; and 3. Incentivising the purchase of non-alcoholic drinks, demonstrating that these interventions had a low policy relevance. The cost-effectiveness analyses showed that all interventions were highly cost-effective, ranging from AUD17 per health-adjusted life year gained (uniform volumetric tax) to AUD3,880 per HALY gained (comprehensive advertising bans). *Note: these are preliminary results, the final results of all interventions will be presented at the conference. **Conclusions**: This study demonstrates the feasibility of conducting a priority-setting process with busy decision-makers to produce policy-relevant economic evidence to assist decision-making. The results can be used to inform alcohol policy implementation at Australian state and Federal government levels.

Ind-462 High Speed Internet and the Widening Gender Gap in Adolescent Mental Health: Evidence from Spanish Hospital Records

PRESENTER: **Daniel Fernandez-Kranz**
AUTHORS: Natalia Nollenberger, Esther Arenas-Arroyo

We exploit exogenous variations in fiber optic (FTTH) deployment in Spain between 2007-2019 to assess the impact of high-speed internet access on adolescent mental health. Combining publicly available administrative data on FTTH rollout, hospital records of behavior and mental health (BMH) cases and large survey data on patterns of Internet use, we find that FTTH access increases addictive Internet usage and reduces time allocated to sleep, homework, as well as social interactions with family and friends with most of these results driven by girls. We also find that access to FTTH increases mental health diagnoses in hospitals and contributes to a notable rise in adolescent suicide rates. A one standard deviation (SD) increase in fiber penetration increases BMH cases by 4.2%. Girls entirely drive this effect. When we analyze older individuals (20 to 24 years old), we do not find statistically significant results. Instead, we do find negative effects of Internet exposure for younger girls (ages 10-14) but, again, no effect for boys of that age. When we look at BMH cases by condition type, we find that fiber penetration increases the incidence of anxiety, mood disorders (depression), drug abuse, self-harm, and suicide attempts, with most effects again due to girls. We document a large effect on cases of self-harm and suicide attempts among girls aged 15 to 19 years (+13.3%) but no significant effect for boys. These results are robust to a series of sensitivity tests, including dynamic estimates that account for treatment effect heterogeneity following the approach of Chaisemartin and D'Haultfœuille (2024), the use of an alternative instrumental variable (IV), and alternative specifications to rule out the influence of changes in ICD coding implemented in 2016.

Ind-2136 Investing In Appropriate Feeding Practices In Early Childhood (24 Months): Socioeconomic And Regional Disparities In Kenya.

PRESENTER: **Susan Arum-Jobando**
AUTHORS: James Odhiambo Oguta, Vincent Were

BACKGROUND Proper nutrition during the first two years of life promotes linear growth, physical and cognitive development that shapes future productivity and human capital. Despite Kenya having child feeding policies, growth faltering peaks at 6-23 months due to inadequate dietary intake. Investing in quality diets during the early years guarantees solid returns by reducing healthcare costs, boosting education outcomes, and breaking cycles of intergenerational poverty. This study aims to understand the factors that contribute to appropriate feeding practices in the early years to guide programming priorities. It also unpacks the socioeconomic and regional disparities to give policy recommendations. **METHODOLOGY** We used a sample size of 3,199 children aged 6-23 months from the Kenya Demographic Health Survey (2022). WHO/UNICEF guidelines were used to define appropriate feeding among children 6-23 months. This were children receiving minimum acceptable diet, minimum dietary diversity and feeding frequency. We used probit regression models to analyze factors that influence appropriate feeding practices across Kenya's diverse regions and socioeconomic settings. Marginal effects were used to estimate the probability of identified factors through coefficients which are interpreted for significance levels using z-scores and confidence intervals. Variance Inflation Facto and Breusch-pagan test were used to check for potential bias. **RESULTS** Our analysis reveals that only 17.26% adhere to appropriate feeding practices. Across the country the most consumed food is milk by 70% (sd 1.49) and food from grains, roots, tubers, and plantains by 33% (sd 0.47) of children. The probability of appropriate feeding practices shows a consistent decline with child age, decreasing by 24.3% ($p<0.001$) for children aged 6-8 months, with similar significant decreases observed through 23 months. Maternal employment and age positively influence appropriate feeding practices, increasing probabilities by 4.85% ($p=0.002$) and 0.38% ($p=0.022$) respectively. Geographic and economic disparities significantly impact feeding practices, with children in more economically developed counties (Embu, Kirinyaga, and Kiambu) showing 12-14% higher probabilities of appropriate feeding, while those in less developed regions like Mandera show decreased probabilities (-8.94%, $p=0.035$). Household wealth quintiles demonstrate a clear gradient, with children from rich households having a 9.22% ($p<0.001$) higher probability of appropriate feeding practices compared to 4.11% ($p=0.015$) for middle-income households. **CONCLUSION** The results suggest that targeted interventions that prioritize regional disparities, maternal income and increasing household economic resources can improve early years feeding practices. There is need to make animal source foods more accessible to children as they are the least consumed among children 6-23 months. The positive association of maternal employment and child feeding outcomes indicates that current human capital and productivity can contribute positively to the development of future human capital. Investing in children's diets during the early years has the potential to break intergenerational poverty. Keywords**: Appropriate feeding, Early childhood, Human capital development, Regional disparities.

Ind-481 Health, Wealth, or Equity? Trade-offs From Households Allocative Decisions in Bangladesh

PRESENTER: **Helen Harris-Fry**
AUTHOR: Mario Cortina-Borja

Introduction: The co-prevalence of underweight, overweight, and micronutrient deficiencies is a growing global challenge. This phenomenon, termed the `triple burden' of malnutrition, is driven by imbalances in dietary quantity and quality that create overlapping health risks across and within populations. Today, South Asia faces approximately equal burdens of underweight and overweight alongside high micronutrient deficiencies. Meanwhile, in the rest of the world, overweight has surpassed underweight as the dominant problem. Even amongst some of the poorest countries, undernutrition and overweight are spread across the wealth distribution, and up to half of within-country inequality in body-mass occurs within households. This provides suggestive evidence that households' budgets are not always the binding constraint, and that priorities other than health may drive households' dietary decisions.

Methods: This paper tests these suggestive claims using the Bangladesh Integrated Household Survey 2018-19 that contains dietary data on 21,808 members in 5,376 multi-person households. We first describe nutritional adequacy -- the extent to which individuals meet their clinical needs of multiple nutrients -- using nonlinear functions that account for diminishing and sometimes negative health returns to food consumption. We then estimate the gains that households can afford through changes in food choices and by reallocating foods within families, which we find by entering each person's adequacy function into a program that maximizes household nutritional adequacy. Seeking to understand the mismatch between observed and potential nutritional adequacy, we unpack the corresponding trade-offs that households face in income and equity. We quantify health-income trade-offs by estimating gender-specific wage production functions and entering them into a nonlinear program. We analyse health-equity trade-offs with a utility maximizing framework that allows decisions to be influenced by families' concerns for both equity and nutritional adequacy.

Results: Our results show that few individuals consume adequate levels of energy or micronutrients. However, food budgets are rarely the binding constraint. Households can afford to meet energy needs of nearly all people, and almost all micronutrient needs. Health-optimised solutions increase mean adequacy of 11 micronutrients from 68% to 95% (an increase of 3.1 SDs). For energy, gains primarily come from reallocation among members, while micronutrient improvements mainly require changes in household-level food choices. Pregnant and breastfeeding women would particularly benefit from intra-household food redistribution.

We further show that households do not face a health–income trade–off when allocating nutrition, at least in the short–run. Nutritional adequacy does not affects wages in this context.

The greater trade-off relates to equity preferences. We find a degree of inequality aversion (for energy) and inequality preference (for micronutrients) that leads to intra–household allocations that are not fully efficient from the perspective of the production of health. Households allocate men more food in general, but fail to adjust the composition of the diet according to needs. As a result, households insufficiently compensate men for their elevated caloric needs, women for their higher iron needs, or pregnant/ breastfeeding women for their additional needs for multiple micronutrients.

Conclusion: Bangladeshi households can afford to meet most of their nutritional needs with their current food budgets. Behavioral interventions should place particular emphasis on the importance of achieving energy balance, highlighting the risks of both deficiency and excess. Interventions should also not assume that women are disadvantaged in the allocation of food.

abs-os110 Consumer Tobacco Product Choices in China: The Impact of a Ban on Flavored E-cigarettes

PRESENTER: **Yuhan Deng**
AUTHORS: Mr. Donald Kenkel, Hua Wang, Alan Mathios

Effective October 2022, the State Tobacco Bureau of China banned the sales of flavored e-cigarettes. Previous research in health economics has explored the impact of e-cigarette flavor bans in the U.S. However, less is known about the impact of flavor bans and other e-cigarette regulations in China, the world's largest tobacco market; according to the China CDC, there are 300 million smokers and over 16 million vapers in China. Bans on flavored e-cigarettes are intended to discourage vaping among teens. Because adult smokers use flavored e-cigarettes as a way to cut down or quit smoking, flavor bans might also have the unintended consequence of discouraging smoking cessation and increasing adult smoking. This study explores the impact of China's ban on flavored e-cigarettes on the tobacco product choices of adult smokers. We conducted two online surveys of smokers in China. The first survey was conducted in 2021 when flavored e-cigarettes were legally available; the second survey was conducted in 2023 after flavored e-cigarettes were banned. The sample size of each survey was about 600 smokers. Each survey included a set of background questions about the respondents' current use of cigarettes and e-cigarettes, followed by a discrete choice experiment. The background surveys provide rich data on consumer attitudes and observational revealed-preference data on consumer choices before-and-after the ban on flavored e-cigarettes. Descriptive analyses of the frequency of the extent of the of flavored e-cigarettes across the surveys provide suggestive evidence of the impact of the flavor ban. We also describe consumer smoking- and vaping related attitudes, including their perceptions of the absolute and relative risks of e-cigarettes and explore the extent to which risk perceptions changed between 2021 and 2023. The descriptive analyses also control for demographics to address potential sampling differences across the surveys. The discrete choice experiments (DCEs) help us to understand smokers' choices between cigarettes, e-cigarettes, and quitting the use of both products. The DCEs experimentally varied policy-manipulable product attributes including prices, health warnings, and the availability of e-cigarette flavors and nicotine levels. We use the stated preference data from the DCEs to estimate linear probability models and conditional logit models of the effects of product attributes on consumer tobacco product choices. To shed light on the models' predictions, in each sample we compare the model predictions of choices under current (2021 or 2023) status quo conditions to the observational data collected in the background surveys. Our econometric analyses yield three estimates of the impact of the ban on flavored e-cigarettes: the difference between consumers' revealed preferences before-and-after the ban; the predicted impact from the choice model estimated using the 2021 stated preference data; and the predicted impact from the choice model estimated using the 2023 stated preference data. The study contributes to economic research on tobacco regulation and provides a case study of China's ban on flavored e-cigarettes.

abs-os111 Understanding Consumer Choices: A Study of Tobacco Product Choices in Indonesia and Malaysia

PRESENTER: **Puguh Prasetyoputra**
AUTHORS: Alan Farandy, Agus Syarip Hidayat, Alan Mathios, Lazuradi Imran, Felix Wisnu Handoyo, Mr. Donald Kenkel, Harris Siagian

In the most recent Global Adult Tobacco Survey data, 33.5% of Indonesian adults and 19% of Malaysian adults are current cigarette smokers. A very large body of health economics research in low-, middle-, and high-income countries estimates the responsiveness of cigarette demand to cigarette excise taxes and other regulations. An emerging body of research explores the determinants of demand for e-cigarettes, but mostly in the U.S. and other high-income countries; much less is known about e-cigarette demand in low- and middle-income countries. This study investigates the determinants of Indonesian and Malaysian smokers' choices between cigarettes, e-cigarettes, and quitting all tobacco product use. We use data from two online discrete choice experiments (DCEs) conducted in 2021 and 2024 with Indonesian subjects and a DCE conducted with Malaysian subjects in 2023. The DCEs experimentally varied policy-manipulable product attributes including prices, health warnings, and e-cigarette flavors and nicotine levels.

We use the DCE data to estimate linear probability models, logistic regression models, and McFadden's conditional logit choice model of consumer choice. The estimates suggest that price is a critical determinant of consumer choices, with higher cigarette prices significantly reducing smoking and encouraging a shift toward e-cigarettes. The results also revealed that younger consumers were more inclined to adopt e-cigarettes as a perceived less harmful alternative, whereas older consumers tended to quit smoking altogether in response to price increases. Our model provides further insights, showing that consumer preferences evolve over time, with younger users exhibiting sustained loyalty to e-cigarettes despite fluctuations in traditional cigarette prices. We further explore the differences in Indonesian consumer choices at two points in time, and we compare-and-contrast the results for Indonesia and Malaysia. In particular, we use our estimated models to simulate the choices Indonesian smokers would make if they faced the tobacco control policies in Malaysia, and vice versa.

This study highlights the necessity for targeted and multifaceted tobacco control policies that should include price interventions, support for alternative lower-risk nicotine products, and continuous monitoring to respond to market and regulatory dynamics. This study contributes to the existing literature by offering a detailed analysis of e-cigarettes in a developing-country setting, emphasizing the interaction between economic, demographic, and product-related factors. The dynamic analysis provided by the CMC Logit model sheds light on the long-term effects of tobacco control policies, particularly in emerging markets, and underscores the need for interventions that address the diverse needs of different consumer segments to enhance the efficacy of tobacco harm reduction strategies.

Bali International Convention Centre – Denpasar A

Global Health Financing Innovations and Policy Impact

MODERATOR: **Allison Portnoy**,

Ind-1739 Determinants of PBPU Membership Activeness in Indonesia and Its Clustering for Subsidy Allocation: A Multi-Year Analysis

PRESENTER: **Samuel Sormin**
AUTHORS: Mr. Mahlil Ruby, Mr. Agus Setiawan, Mr. Muhammad Ikhsan Kalla, Mr. Benjamin Saut Parulian Simanjuntak, Mr. M. Mizmara Alan Falihin

BPJS Kesehatan membership in the PBPU segment is heavily influenced by participants' ability and willingness to pay premiums, which determines the active status of membership cards (PBPU_AKTIF). Understanding the determinants of PBPU_AKTIF is critical for public policy, especially in developing countries with similar social security systems.

This study examines the impact of human development metrics, such as the Human Development Index (HDI), Life Expectancy (LE), Mean Years of Schooling (MYS), and Poverty Rate (PR) on PBPU_AKTIF. Using secondary data from 2021–2023 across various provinces in Indonesia, multiple linear regression analysis and classical assumption tests were applied. Additionally, clustering methods—K-Means, Hierarchical, and DBSCAN—were used to group provinces based on PBPU membership activeness and subsidy needs.

K-Means and Hierarchical Clustering identified 4 clusters, while DBSCAN revealed 2 clusters with significant noise in several provinces. Regression results showed that HDI (coefficient 0.0082) and PR (coefficient 0.0022) significantly influenced PBPU_AKTIF, with an adjusted R-squared of 0.479.

These findings indicate that improving HDI and reducing poverty directly impact PBPU activeness. Consequently, need-based subsidy policies can serve as strategic measures to enhance PBPU_AKTIF. The clustering results provide a foundation for targeted subsidy approaches, such as increased allocations for provinces with high noise levels in DBSCAN.

This study contributes to global literature on the efficiency of social security systems in developing countries, with practical implications for subsidy distribution and evidence-based policymaking.

Keywords: PBPU_AKTIF, health insurance activation, Human Development Index, Poverty Rate, clustering, multiple linear regression, social welfare, public policy.

Ind-1837 Medical Debt, Self-Insurance, and the Value of Health Insurance for the Non-Elderly

PRESENTER: **Katsuhiko Nishiyama**

About 60% of non-elderly workers are insured through employer-sponsored health insurance (ESHI). However, ESHI is not the only option. Workers frequently resort to two alternative forms of insurance: (1) self-insurance through saving and borrowing and (2) delaying medical bill payments, with 41% of working-age adults in some form of debt caused by medical bills (Lopes et al. 2022). This paper studies how the two alternative insurance channels affect the value of ESHI, which in turn affect job search decisions. Specifically, I address two questions: (1) How does the value of ESHI vary based on one's net liquid assets and medical debt? (2) How do job-to-job transition rates change with different net liquid assets and medical debt? These questions stem from well-documented criticism of ESHI that bundling health insurance and employment could lead to inefficient matches of employers and workers through job push and job lock. Job push occurs when uninsured workers move to less productive jobs that offer health insurance, while job lock happens when insured workers avoid more productive jobs that lack insurance. By answering these questions, I aim to identify which types of workers are more likely to make such distorted decisions in job mobility. My main contribution is to consider the role of self-insurance and medical debt, unexplored channels in the literature on ESHI and labor market dynamics (Dey and Flinn 2005; Dey and Flinn 2008; Aizawa 2019; Aizawa and Fang 2020; Fang and Shepard 2019). To that end, I develop a job search model augmented with four features: (1) a stochastic process of health status, (2) enrollment in ESHI through job search decisions, (3) saving and borrowing decisions to capture self-insurance, and (4) accumulation and repayment decisions of medical debt. I estimate the model using the Survey of Income and Program Participation (SIPP) and the Medical Expenditure Panel Survey (MEPS), covering 2017-2019. The structural parameters are estimated with Simulated Method of Moments to match data moments from the joint distribution and evolution of state variables: health insurance status, net liquid assets, medical debt, employment status, wage, health status, and flow medical expenditure. After obtaining the estimates, I quantify the value of ESHI and find non-negligible variations. For instance, for workers with the median level of wage and good health condition, the willingness to pay ranges from 23% of their wage to 36%, depending on their assets and medical debt. Moreover, the results highlight two specific profiles of workers valuing ESHI more: (i) workers with a limited to moderate net liquid assets but not near the borrowing limit and (ii) workers with more medical debt. For workers with medical debt, the valuation for ESHI peaks when their debt reaches about $40,000, beyond which there is little change. Lastly, I also confirm that uninsured (insured) employees with a higher valuation for ESHI exhibit higher (lower) rates of transition to jobs with (without) ESHI.

Ind-1658 Socioeconomic Inequalities in Financial Risk Protection in China: an Evaluation of Universal Coverage of Social Health Insurance

PRESENTER: **Yaping Deng**
AUTHORS: Jingxian Wu, Cong Li

Background Financial risk protection and equity are fundamental components of Universal Health Coverage (UHC), ensuring equitable access to health services without imposing undue financial hardship. Since the implementation of the New Medical Reform in 2009, China has made significant progress in achieving universal coverage of social health insurance (SHI), with the aim to provide equitable, accessible, and affordable basic healthcare for all its citizens. This study evaluates China's progress in financial risk protection by examining the socioeconomic inequalities in catastrophic health expenditure (CHE) and the role of SHI coverage in addressing these inequalities. **Methods** Data were obtained from seven waves of the China Family Panel Studies (CFPS), a nationally representative household survey conducted biennially from 2010 to 2022. CHE was defined as out-of-pocket (OOP) healthcare payments exceeding 10% of total household expenditures or 40% of non-food expenditures. SHI coverage was measured as a binary variable indicating whether all household members were insured. Socioeconomic inequalities in CHE were assessed using the Erreygers concentration index (ECI), with per capita household income as the ranking variable. Decomposition analysis based on the recentered influence function (RIF) regression was conducted to evaluate the contributions of SHI coverage and other covariates to CHE inequalities. All analyses were weighted using cross-sectional weights to ensure representativeness. **Results** The estimated ECI for CHE, based on the 40% non-food expenditure threshold, remained consistently negative throughout the study period, indicating a pro-poor distribution. Its absolute value decreased from 0.204 ($p<0.001$) in 2010 to 0.106 ($p<0.001$) in 2022, reflecting reduced inequality over time. The contributions of household SHI coverage to the CHE inequalities were -0.863% ($p<0.05$) in 2010, 0.622% ($p>0.1$) in 2012, -0.033% ($p>0.1$) in 2014, -4.824% ($p<0.05$) in 2016, -13.925% ($p<0.05$) in 2018, -1.203% ($p>0.1$) in 2020, and -1.110% ($p>0.1$) in 2022. Additional factors, such as higher education levels (particularly university degrees of higher) and stable employment of household heads and larger household sizes (five or more members) were more consistently associated with reduced inequalities. In contrast, utilization of inpatient and outpatient services and the prevalence of chronic diseases significantly increased the observed inequalities. Similar results were observed using the 10% threshold for CHE. **Conclusion** Despite progress in reducing socioeconomic inequalities in CHE, substantial pro-poor disparities remain. SHI coverage has played a positive role in mitigating financial risk disparities, particularly after 2016, but its impact has been limited. Socioeconomic factors, such as education and employment stability, and household composition have demonstrated stronger and more consistent effects on reducing disparities. These findings highlight the need for integrated policy strategies that strengthen financial risk protection while addressing broader socioeconomic determinants of health equity to achieve UHC.

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Ind-2044 Designing and Implementing Capitation for Primary Healthcare in Rwanda: Insights from the Nationwide Rollout

PRESENTER: **Regis Hitimana**
AUTHORS: Eniola Olaleye, Juan Francisco Garamendi, Babaniyi Olaniyi, Enric Jané, Ina R. Kalisa, Jean Marie Vianney Hakizayezu

Background: Capitation, as a healthcare payment mechanism, presents a promising avenue for sustainable financing of universal health care (UHC). It shifts the emphasis from volume-based care to a model that contains costs while enhancing value-based care. Although capitation has been explored in various contexts, its design and application in primary healthcare within low-income settings, particularly in sub-Saharan Africa, remains relatively nascent. **Research Aim**: This study investigates Rwanda's approach to designing and implementing a capitation model for primary healthcare providers. By leveraging facility-level historical data, incorporating utilization heterogeneity across regions, and introducing continuous performance-based adjustments, Rwanda's capitation model is designed to chart a sustainable path toward UHC. This presentation will provide detailed insights into the innovative strategies employed to improve the cash flow and predictability of funds for healthcare facilities, incentivize efficient delivery of PHC services, and increase the predictability of expenditure for primary care services. **Methods**: The capitation formula was developed using historical healthcare utilization and cost data at the patient level, providing a robust foundation for analyzing facility-level demand patterns and costs. Facilities were stratified according to past performance metrics, ensuring that payments were aligned with variations in health demand and provider capacity. Moreover, Rwanda instituted an adjustment mechanism, enabling capitation amounts to be refined based on real-time monitoring of facility utilization rates and health trends. A set of indicators was used to track health facility performance and identify unintended consequences due to the capitation model (such as a decrease in service availability), and forecasting models were used to flag facilities with abnormal behaviors. Quantitative assessments of the implementation of the capitation model during the initial months of implementation include analyzing utilization rates, cost patterns, and the effectiveness of capitation adjustments using longitudinal data analysis. Real-time monitoring data will be used to track trends in healthcare access and the financial performance of facilities, providing insights into the adaptability of the capitation payments. **Key Results**: With capitation set to launch in January 2025, the presentation will cover findings from the first six months of implementation. Key areas of focus include the performance of the capitation formula across health facilities, the effectiveness of the quarterly adjustment strategy, the utility of indicators in monitoring progress and identifying unintended consequences, and observations on the data collection quality. **Conclusion and Implications**: This presentation aims to share experiences from Rwanda's nationwide implementation of a capitation model in primary healthcare, offering practical insights for other countries considering similar pathways. Specifically, it will highlight lessons on designing risk-adjusted, dynamically monitored capitation models suitable for resource-constrained environments, providing valuable guidance for the strategic implementation of UHC initiatives.

Ind-1098 Awareness of Strategic Purchasing Systems for Health Among Key Implementers in Ethiopia: The Case of Case-Based-Providers Payment Design in Ethiopia.

PRESENTER: **AYALNEH ASMAMAW ATNAFU**

Introduction: Many low-and middle-income countries prioritize generating enough revenue to achieve Universal Health Coverage (UHC).

However, simply increasing spending is not enough to meet a country's health goal. The funds need to be strategically allocated to priority populations, programs, and services to enhance access, improve care quality, and promote equity and financial protection. Moving away from "passive purchasing" toward more "active" or 'strategic purchasing" methods, such as Case-Based Payment (CBP), is crucial for optimizing health system performance and ensuring value for money. Additionally, designing, piloting, and implementing CBP, along with providing targeted capacity-building for implementers, is essential for effective strategic purchasing. Ethiopia has been implementing Community-Based Health Insurance since 2011, and used Fee-For-services as a provider payment modality, with all its limitations. Thus, Designing and piloting case-based payment provider payment system is crucial. This survey seeks to assess the awareness of implementers in Ethiopia regarding strategic purchasing, with a particular focus on CBP. **Methods:** An exploratory qualitative survey design was used to "to assess the awareness/ knowledge of implementers on strategic purchasing and (to) identify the training priority areas on strategic purchasing. Twenty-Six key informant interviews from the purposively selected three regions (Sidama, Oromia, Afar), and one city administration (Addis Ababa City Administration) were conducted. A semi-structured guiding tool with a structured checklist captured the qualitative and quantitative data. The qualitative and quantitative findings were analyzed thematically and descriptively, respectively. **Findings:** In this survey, we explored informants' knowledge of the selected strategic purchasing components (payment modalities, benefits packages and claim auditing), and the potential training gaps. Regarding, strategic purchasing, the understanding of the informants was found to be better at benefit packages and claim auditing. Among the explored payment modalities, the participants have relatively better awareness of Fee for Service and capitation. However, the understanding of most informants about case-based payment were low. The quantitative result also showed that only two (7.7%) from 26 respondents have a better understanding of the case-based payment. It was also explored that the respondents tried to explain benefit packages and claim auditing by relating it with their experiences even if they didn't explain them with their basic principles and assumptions. The knowledge of strategic purchasing of respondents in the hospital was lower than the purchaser. In addition, the participants recommended that short-term and long-term training should be provided on HCF, strategic purchasing, claim management, and payment modalities, **Conclusion and recommendation:** The survey explored that the knowledge of strategic purchasing is low and tailored, and focused capacity-building trainings should be provided. Besides, special attention should be given to the hospital/facility-level implementers whose understanding of strategic purchasing is relatively low.

Ind-2551 Examining the Budget Impact of Malaria Treatment at a Public Healthcare Facility in Nigeria: Evidence from a University Medical Center

PRESENTER: **Charles C Ezenduka**

Background

Malaria remains a leading cause of death and disability in Nigeria, as in most LMICs constituting huge economic burden on the population. Current evidence on the facility costs of treatment remains essential to inform the efficiency of resource utilization and planning for improved malaria control and elimination. This study estimated the financial and economic costs (for budget implication) of treating uncomplicated malaria through a public healthcare facility in Nigeria.

Methods

A cost-of-illness study approach was adopted to estimate the cost of treating uncomplicated malaria at a secondary health facility setting. Prospective and retrospective data were collected within 3 months of between September and November 2021. From a provider perspective, hospital costs were estimated from a standard and comprehensive costing procedure. Capital and recurrent items were identified, measured and valued using the ingredient approach, combined with step-down methodology. The costs of capital items were annualized according to their useful life years. Costs attributable to malaria treatment were calculated on the basis of the proportion of treated malaria cases to the total outpatient visits. The costs were broadly divided into financial and economic costs. Financial costs mostly accounted for the budget impact. Costs were calculated in local currency [Naira] and converted to US dollars at 2021 foreign exchange rate [US$1=N448].

Results

The total annual cost of N84.548 million (US$188, 723.51) was spent on the treatment of uncomplicated malaria, at US$32.48 per case, representing about 25% of the hospital's total expenditure in the study year. Personnel accounted for 77% of total expenditure, followed by antimalarial medicines at 8.7%. The financial cost of treatment amounted to US$216,869.50 per annum, at US$37.33 per case. More than 45% of outpatients' visits were treated for uncomplicated malaria. Changes in personnel costs, drug prices and malaria prevalence significantly impacted the study results, underscoring the need for improved efficiency in the use of hospital resources in the management of malaria cases in the facility.

Conclusion

Findings suggest that malaria treatment at the facility consumes a substantial amount of facility resources representing up to a quarter of the hospital budget. The costs were driven mainly by personnel and high proportion of malaria cases, highlighting the scope for enhanced efficiency of resource allocation and utilization to prevent wastages and reduce costs to the provider and ultimately the patient. Findings will contribute information for planning to enhance the efficiency of malaria control towards elimination. High budget implication underscores the need for continued funding support for malaria control and elimination in Nigeria.

***Keywords**: Malaria treatment, healthcare facility, resource utilization, financial costs, economic costs, budget impact, Nigeria.*

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Ind-2121 Assessing the Efficiency of Public Health Expenditure in South Africa: A District-Level Analysis Using Data Envelopment Analysis

PRESENTER: **Anja Smith**
AUTHORS: Fouché Venter, Calumet Links

Background

Since the global financial crisis, South Africa's fiscal position has deteriorated significantly. Revenue growth slowed to a lower permanent trajectory post-2010, while government spending continued its pre-crisis path, resulting in a steady increase in public debt as a percentage of GDP—from 31.5% in 2009 to 57.2% in 2019.

The Covid-19 pandemic put further strain on the economy and fiscus, leading to debt reaching 74.1% of GDP by 2024. By 2026, the South African government will spend 17% of its budget on servicing debt, up from 6.5% om 2009 and 1.5 times more than it does on healthcare.

The rapid increase in debt over the last 15 years has brought debt consolidation to the centre of fiscal policy. While the government has made substantial effort to protect the social wage budget (health, education and social protection), even in the presence of other austerity measures, this has become increasingly more difficult. Over the next three years, the health budget is expected to grow at only 4.7%, far below expected inflation in per capita terms and definitlely below typical health inflation levels. In this context, it is a matter of urgency that healthcare expenditure efficiency, achieving maximum outcomes within a given resource envelope, is prioritised.

Research aim

This study aims to assess the efficiency of South African public healthcare expenditure at the district level. While prior studies have assessed efficiency at the provincial and facility levels, this analysis focuses on the district level.

Methodology

We use Data Evlopment Analysis (DEA) to generate district efficiency scores using a self-constructed dataset at the district-level from the District Health Barometer for 2016 to 2022. The dataset spans both primary and secondary health expenditure and outcomes with separate DEA analyses by level of care. Apart from healthcare expenditure, we utlise input variables such as health personnel, hospital beds, and outcome variables such as infant, maternal, and neonatal mortality rates. Stochastic Frontier Analysis to adjust input slacks will also be used to produce additional estimates.

Results

Using longitudinal data from 2016 to 2022, the DEA model reveals an increase in average district efficiency scores from 46.4% in 2016 to 50.3% in 2019, followed by a decline to 42.7% in 2022. This suggests that, in 2022, health resources could be reduced by 57.3%, without deteriorating outcomes if all districts achieved the efficiency level of the most efficient district. However, this initial analysis and finding do not account for exogenous factors influencing efficiency, necessitating a second-stage analysis.

In the second stage, panel regression techniques (e.g., Tobit regression) analyse how socioeconomic conditions, institutional characteristics, and district-level variables impact efficiency scores. The adjusted scores highlight the extent of resource inefficiency relative to the best-performing districts.

Conclusions and policy implications

By identifying districts with significant expenditure inefficiencies, the study will help inform targeted interventions, with high-performing districts serving as models for best practices. Ultimately, the findings aim to guide policy reforms and advance discussions on achieving universal health coverage under South Africa's proposed National Health Insurance (NHI) framework.

Ind-2676 Have we Gotten it All Wrong? A Critical Look at Prioritizing, Financing and Tracking Primary Care Through the Government Budget

PRESENTER: **Jacopo Gabani**, University of York
AUTHOR: Moritz Piatti-Fuenfkirchen

Background: Primary health care (PHC) serves as the main entry point for patients into the healthcare system. Weaknesses in the availability and quality of PHC could have a negative impact on health outcomes. In most low and lower middle-income countries PHC is financed from the government budget. Yet, problems in managing these finances abound which has detrimental consequences on the delivery of primary care and consequently health outcomes. **Research question:** In this paper we identify the most pressing public financial management challenges in the delivery of primary care and examine whether the available literature and ongoing academic discourse in PHC financing is well positioned to respond to country needs. **Methods:** The paper draws on an in-depth review of PFM systems that cater for primary care across 50 low income countries to identify how primary care is positioned within the budget, how it can be prioritized, and how expenditures can be tracked. Findings from the review are compared to an analysis of the PHC financing literature to assess how relevant and actionable this body of work is for the most dominant PFM constraints these countries are facing. The literature review was conducted, analyzing peer-reviewed articles, policy reports, and case studies published between 2000 and 2023. Databases searched included PubMed, Scopus, and the World Health Organization's Global Health Observatory. **Results and conclusions:** In this paper we find that many PFM systems don't accommodate for PHC appropriately. This does not allow for prioritization of PHC, legislative discourse, facilitating the necessary fund flows, or tracking and evidence-based

decision making. Yet, the PHC financing literature and most technical assistance work in low and lower middle income countries does not appear to cater to this urgent need. The paper concludes that an emphasis should be placed on appropriately structuring PFM systems such that an evidence based decision making process can take place such that countries can prioritize PHC, track spending and hold actors accountable for their decisions.

3:30 PM –5:00 PM TUESDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Lotus

R&D, Technologies and Treatments

MODERATOR: **Miaoqing Jia**, Boston University

Ind-1379 Where is(n't) Digital Health R&D Happening? Focal Areas and Gaps in Digital Therapeutics Research Based on the Global Burden of Disease

PRESENTER: **Linea Schmidt**
AUTHORS: Lars Masanneck, Ariel Dora Stern

Introduction: In recent years, Digital Health Technologies (DHTs) have emerged as a promising opportunity for addressing (often unmet) health challenges in a scalable and decentralized manner. “Digital Therapeutics” (DTx) represent a specific subgroup of DHTs; DTx treat or alleviate health conditions by leveraging software components. This study aims to evaluate the alignment between the focal research and development (R&D) activities within DTx and national-level health trends described by the Global Burden of Disease (GBD) study. In other words, we consider where and when DTx R&D activities in digital health align with disease-driven demand for therapies.

Methods: We analyzed all DTx-related clinical trials from ClinicalTrials.gov between 2005 and 2023 (n=7,303, US studies: n=2,468) and compared their target indications with trends described by the GBD study, encompassing worldwide health data through the end of 2021. Disability-adjusted life years (DALY) from the GBD were used as the key measure of unmet medical needs throughout the analysis.

Results: We show that the areas of DTx R&D broadly follow the trends described by the GBD—i.e., R&D activity can be predicted by expected demand to a large extent—although the ranking of individual condition categories differs in key disease areas. While cardiovascular diseases and neoplasms represent the highest disease burden in the US, the largest numbers of DTx trials focus on mental and neurological disorders. Independent of the study location, the majority of DTx trial sponsors (institutions responsible for the trial, but not necessarily providing funding) are research institutions. Based on the analyzed trials we find that DTx R&D better aligns with GBD trends for countries with a high Socio-Demographic Index (SDI), as compared to those with a middle or lower SDI. The top ten DTx R&D fields in the US align closely with the US GBD for females under 70. This echoes findings from the German market, the first country globally to regulate and reimburse DTx. In general, changes in policy and reimbursement appear to influence clinical trial activity: US DTx R&D increased following the Digital Health Innovation Action Plan (2017) and the establishment of the Digital Health Center of Excellence (2020). Similarly, Germany saw growth in DTx trials registered at ClinicalTrials.gov after introducing the “DiGA” (digital health application) reimbursement pathway in 2019. Among indication fields, mental health has dominated US DTx R&D, paralleling the recent focus of digital health venture funding that has been documented. While most US funding institutions prioritize mental and neurological disorders, the US NIH uniquely emphasizes neoplasms—an area under-served by digital offerings relative to its global burden.

Conclusion: Our findings suggest that observed trends in both R&D and patient use may originate from both the demand and the supply sides. Future work will focus on understanding the economic drivers of DTx R&D, disparities in addressing under-served populations—in particular outside of wealthy regions—and how DTx are utilized across trials.

Ind-857 Marketing Authorization and Strategic Patenting: Evidence from Pharmaceuticals

PRESENTER: **Lucy Xiaolu Wang**
AUTHOR: Dennis Byrski

Patents can incentivize innovation, but pharmaceutical firms often extend market exclusivity by patenting minor modifications to existing drugs, raising concerns about low-novelty patents that add little therapeutic value. This study examines how patenting behavior changes after marketing authorization, a regulatory milestone that makes clinical trial data public and thereby creates ``prior art'' that limits future patent claims. Using a novel European patent-drug dataset and event study methods, we exploit plausibly exogenous variation in the time from patent priority filing to marketing authorization. We find a significant decline in strategic patenting after authorization, particularly in secondary patents and those covering the same disease areas. In contrast, follow-on product patents and patents for new disease areas remain stable, suggesting that authorization selectively curbs low-novelty filings. Both originators and other firms respond similarly, though at different speeds. The absence of similar responses after earlier milestones indicates increased difficulty in obtaining or enforcing low-value patents as the likely mechanism. Robustness checks---including alternative difference-in-differences estimators, constant exclusivity samples, and analyses accounting for non-European market incentives, firm characteristics, and instrumental variable approaches---support our conclusions. Our findings show how regulatory data transparency can indirectly improve patent quality.

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Ind-1260 Who is More Capable? Evaluation of Diagnostic Quality between Large Language Models and Primary Care Physicians

PRESENTER: **Dr. Zhang Zhang, PhD**, Johns Hopkins University
AUTHORS: Dong (Roman) Xu, Tianqi Zhou, Wenjun He, Qianfang Cao

Introduction: Primary care physicians (PCPs) are the important gatekeepers in China's healthcare system, but challenges persist due to limited education, skillsets, and resources. To address these issues, the Chinese government has introduced various policies and interventions to strengthen PCP capacity. The rapid development of technologies such as Artificial Intelligence and large language models (LLMs) presents a promising opportunity to assist PCPs and strengthen the primary care system. However, little is known about the diagnostic quality of LLMs in primary care settings, particularly in emerging markets like China. The objective of our study is to compare the diagnostic capabilities of LLMs and PCPs** in China across nine common diseases using a standardized patients (USP) approach.

Method: We conducted a national representative sampling in 1226 primary care clinics in 7 provinces. The observation period of our study is from 2021-2024. We included 2200 USP visits, including nine disease conditions: common cold, Type 2 diabetes, gastritis, child diarrhea, low back pain, depression, angina, headache, and asthma. The LLM platforms include ChatGPT3.5, GPT4 (including GPT4o and Bing Chat), Claude, and Gemini, evaluated across four diagnostic dimensions: consultation, examination, diagnosis, and treatment. A total of 900 interactions were conducted, with 100 cases per condition and 20 interactions per LLM for each case.. LLMs' performance was measured through recall, precision, and F1 scores. Recall indicates the percentage of suggested items by LLMs or PCPs followed clinical guidelines over the total number of suggested items by clinical guidelines. Precision refers to the rate at which suggested items by LLMs or PCP followed clinical guidelines over the total suggested items by LLMs or PCPs. F1 scores are the weighted average value of precision and recall.

Results: First, for the performance of recall, on average, compared to PCPs, LLMs have a higher median value regarding consultation (LLM: 0.300 [95%CI: 0.290-0.310] vs PCP: 0.167 [0.161-0.182]), examination (LLM:0.286 [95%CI:0.273-0.300] vs PCP:0.091 [95%CI: 0.083-0.1]), diagnosis (LLM:0.167 [95%CI:0.167-0.167] vs PCP:0.001 [95%CI:0.001-0.077]), and treatment (LLM:0.429 [95%CI:0.400-0.462] vs PCP:0.167 [95%CI:0.167-0.182]). Second, in terms of precision, LLMs and PCPs demonstrate the same median value (LLM:1.00 [95%CI:1.00,1.00] vs PCP:1.00 [95%CI:1.00,1.00]) across consultation, diagnosis, and treatment, indicating comparable performance. However, LLMs have a relatively lower mean value in examination than PCPs (LLM:0.800 [95%CI:0.750-0.833] vs PCP:1.00 [95%CI:1.00-1.00]). The average F1 scores of LLMs are higher than PCPs in consultation (LLM:0.444 [95%CI:0.429-0.462] vs PCP:0.3080 [95%CI:0.296-0.313]), examination (LLM:0.417 [95%CI:0.400-0.429] vs PCP:0.286 [95%CI:0.270-0.286]), and treatment (LLM:0.545 [95%CI:0.500-0.571] vs PCP:0.400 [95%CI:364-0.400]), and similar F1 scores in diagnosis (LLM:0.286 [95%CI:0.286-0.333] vs PCP:0.286 [95%CI:0.286-0.333]).

Conclusion: LLMs demonstrated higher recall across consultation, examination, diagnosis, and treatment than PCPs. Although LLMs showed comprehensiveness in diagnosis, they were less precise in examination tasks, highlighting an area for improvement. The overall findings indicate that LLMs could enhance guideline adherence and care consistency. It suggests that LLMs have the potential to be supportive tools in primary care with resource-limited settings. Further refinement is needed to optimize their use in clinical environments to improve the precision.

Ind-2246 The Launch and Price of Patented Medicines in Canada and its Reference Countries: A Retrospective Cohort Study

PRESENTER: **Wei Zhang**, University of British Columbia
AUTHORS: Daphne Guh, Nathaniel Dyrkton, Alexander Tam, Paul Grootendorst, Aidan Hollis, Aslam Anis

Background Recent studies have criticized that a large proportion of new medicines approved for marketing in the United States (US) and European countries only add minor or no therapeutic benefit. However, limited analyses have been conducted to assess the launch (i.e., sales) and price of new medicines over time by their therapeutic value. **Objective** To examine the launch and price of new medicines by therapeutic value among Canada and its 13 previous and current price reference countries (Australia, Belgium, France, Germany, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, the United Kingdom, US). **Methods** We used the IQVIA MIDAS Sales quarterly data in Q3 2012-Q4 2023, which provide sales values and volumes of drug products for the 14 countries. We included a cohort of molecules that were sold in the 14 countries in 2013-2021 and categorized as "new active substances" and "innovative branded products" in IQVIA MIDAS Sales data. Each molecule was followed up by a minimum of 2 years. The global first launch date for each molecule was the first sale date in the 14 countries. The outcomes for each country included the cumulative probability of launching since the global first launch and median time-to-launch using Kaplan-Meier method, and list prices up to 5 years after domestic launch. Therapeutic value information was obtained from Canada's Patented Medicine Prices Review Board, the German Institute for Quality and Efficiency in Health Care, the independent French medicine bulletin, Prescrire International, and the US Food and Drug Administration. Each organization's ratings were categorized into major, minor, little to no, or missing benefit. **Results** Our cohort included 422 new molecules (13.5% major, 14.2% moderate, 38.4% little to no, and 33.9% missing). The probability of launching new molecules reached a plateau or close to a plateau within 5 years since global first launch in all countries with several exceptions. In effect, if these molecules had not been launched within 5 years, they were unlikely launched up to 11 years. Variation between countries in the speed and probability of launching molecules was the highest for molecules with major benefit. The median time-to-launch (the time by when 50% of the molecules with major benefit had been launched) ranged from 0 for the US to 10 years for Canada except for the Netherlands where the median time-to-launch could not be estimated because the cumulative probability of launching plateaued at 0.17. The launch of molecules with moderate benefit was the fastest/highest in all countries except the US and the Netherlands. The median list price of molecules with major benefit was substantially higher in the first year after domestic launch than that of molecules with moderate or little to no benefit in all countries. **Conclusions** Our preliminary analysis results indicate that medicines with major therapeutic benefit have higher list prices and slower (and more variable) launch speed. Our study will inform policy decisions regarding the review and consideration of therapeutic value for drug market approval and reimbursement.

Ind-361 Exploiting Partial Knowledge of Drug Dffects Using Optimal Fractional Treatment Rules Revealing Hidden Welfare in Zero-Effect Studies

PRESENTER: **Johannes Cordier**, University of St. Gallen
AUTHORS: Owen O'donnell, Raf Van Gestel

Introduction The high failure rates in Phase III clinical trials often stem from statistically insignificant average treat- ment effects. However, such conclusions overlook the potential benefits for specific subgroups within the study population. Traditional trial designs and stratification lack the flexibility to address this hetero- geneity, leading to missed opportunities for effective patient-targeted interventions. Our study addresses this limitation by integrating causal machine learning techniques with fractional treatment rules, offering a probabilistic, personalized approach to treatment assignment that reflects the treatment heterogeneity across patient subgroups and the confidence in the estimated effects. This methodology aims to capture hidden welfare by identifying and capitalizing on positive effects within subsets of patients.

Methodology We exploit the ACCORD dataset, including 10,251 patients with type 2 diabetes randomized into inten- sive and standard glucose-lowering therapy groups. This dataset provides a rich source of demographic, clinical, and outcome data, allowing detailed exploration of subgroup responses to treatment. We identify and quantify treatment heterogeneity through causal forests, an efficient method for estimating subgroup- specific treatment effects. Building on the insights from causal forests, we employ fractional treatment rules, grounded in the minimax-regret criterion, to guide treatment assignment. Fractional treatment rules allow for a more nuanced policy, assigning treatment with a probability based on the subgroup's estimated benefit, rather than a rigid, binary allocation. This methodological approach not only enhances decision-making flexibility in precision medicine but also enables adaptive trial designs.

Expected Results Preliminary analyses suggest that our combined approach will reveal beneficial treatment effects within certain subgroups that would otherwise be lost in estimates of average treatment effects. Specifically, we anticipate identifying patient subpopulations who experience improved cardiovascular outcomes with intensive glucose lowering, despite average results suggesting no significant benefit. Fractional treatment rules are expected to yield higher welfare by tailoring treatment probabilities to the estimated effect within each subgroup, offering a viable alternative to all-or-nothing trial designs. This framework could further inform adaptive trial designs by identifying patient segments worthy of targeted interventions and follow-up trials.

Conclusion This study makes a significant methodological contribution by integrating causal machine learning with fractional treatment rules, a novel approach that may reduce clinical trial failure rates through refined subgroup analysis and adaptive sampling. Our findings could transform clinical trial design and drug development by providing an evidence-based, probabilistic approach to patient stratification, ultimately enabling more efficient and targeted drug approval pathways. This probabilistic method holds promise not only for enhancing patient outcomes through precision medicine but also for reducing development costs by focusing resources on patient populations with demonstrated treatment response potential.

Ind-1092 Target Product Profiles: Opportunities and Implications for Policymaking a Scoping Review

PRESENTER: **Mr. Nitirot Phasitthanaphak**
AUTHORS: Yot Teerawattananon, Sichen Liu, Yi Wang, Teerawat Wiwatpanit, Tanainan Chuanchaiyakul, Carla Barceló, Thanakit Athibodee

Background

Target Product Profiles (TPPs) serve as tools for strategic planning in medical innovation development by facilitating communication with regulators and developing market access strategies. For technology developers, TPPs indicate the key product attributes for a particular medical innovation to meet specific public health needs. By highlighting these needs, policymakers involved in developing TPPs can help align the development of new technologies with health policy objectives and public health priorities. This study aims to review published TPPs, the extent of stakeholder involvement, their development process, and identifying the common themes. Through examining these elements, this review contributes to understanding how TPPs can be optimized to better support evidence-based, policy-aligned innovation in healthcare.

Methods

A scoping review of publicly available TPPs was conducted to understand the process that goes into these documents. Literature searching was conducted across multiple databases to identify TPPs including Pubmed, Scopus, Embase, Web of Science, and websites of WHO and FIND, with screening performed by independent reviewers. An initial search was conducted in August 2023 with an updated search conducted in June 2024.

Results

Eighty-two articles were selected for the review, containing a total of 122 TPPs. Most TPPs are targeted towards general global use settings (91%) while only a small number are specific to LMICs (4%). A majority of TPPs pertained to innovations for medical devices and diagnostic tools (61%), followed by drugs and advanced therapeutic medicinal products (14%). Health professionals were the most involved stakeholders among the 82 studies (79%), followed by academic researchers (63%) and policymakers (62%).

Most studies used Delphi-like processes for TPP development including scoping TPPs, drafting and identifying TPPs, and consensus building. Methods used to develop TPPs included review and evidence synthesis, interview and survey, focus group discussions and meetings, and modelling. The most used methods for each stage were review and evidence synthesis for scoping TPP, focus group discussion and meetings for drafting and identifying TPP, and public consultation for consensus building. Modelling techniques were infrequently used in TPP development, despite their potential to quantify attributes like cost-effectiveness and optimize product specifications, which may indicate an area for future development to enhance data-driven decision-making in TPPs.

The product attributes defined in the TPPs can be grouped into 34 categories. The most common categories were: intended use, target end-user, and intended use setting which were relevant to nearly all types of innovations. Target user was commonly considered under device, diagnostic tools and system-level tools, but was less frequently considered for medicinal products, vaccine, and digital health. Other commonly considered categories included performance measures such sensitivity, specificity, efficacy, and safety. The TPPs of device and diagnostic tools considered the greatest number of categories compared to other types of innovations.

Conclusion

TPPs can help guide medical innovation development to align with public health needs, by indicating product attributes defined through an iterative process combining stakeholder engagement, data-driven techniques, and existing precedence.

Ind-1632 Technological Progress or Waste? Evidence from Large Diagnostic Investments

PRESENTER: **Ms. Maria Wisniewska**
AUTHORS: Daniel Avdic, Anthony Scott, Johannes Kunz

Background: New technologies are one of the main drivers of increased healthcare spending. While they often contribute to improvements in health outcomes, the efficiency of utilisation and distribution of these technologies has become a critical issue for policymakers. One of these technologies is imaging, which plays a crucial role in diagnosing and managing diseases. While expanding imaging services can address gaps in underserved areas, its value potentially decreases in high-density markets.

Objective: This study investigates the impact of geographic variation in the adoption of new CT scanners in Australia between 2012 and 2022. Specifically, it examines the expansion of equipment in saturated and unsaturated markets. The study evaluates how new equipment influences local utilization, physician behaviour, financial implications, and testing quality.

Method: Using administrative data of all healthcare services provided in Australia from the Person Level Integrated Data Asset (PLIDA), we identified all new postal areas of the country that received their first equipment during our period of interest. We classified these areas as saturated or unsaturated based on their proximity to already existing equipment. We used two methods to obtain robust estimators of the effect of equipment emergence on the selected outcomes: difference-in-differences (DID) and synthetic difference-in-differences (SDID) framework compared treated areas (with new equipment) to controls (neighbouring areas without equipment during the study period). Outcomes included local scan utilisation, local physician requests, average cost per test, and site-specific testing patterns.

Results: Both DID and SDID results validated the classification into saturated and unsaturated areas, showing increased utilisation in unsaturated areas following new equipment introduction, while utilisation in saturated areas remained unchanged. Physician requests for CT scans rose in both market types, with a stronger effect in unsaturated areas. Site-specific analysis highlighted increased utilisation of overused scan types, such as spine and head scans, in unsaturated areas, while no significant changes were observed in saturated areas.

Discussion: The findings align with prior research on supply-side factors driving geographic variation in imaging utilization. In unsaturated areas, the emergence of new equipment appears to address unmet health needs, but it also raises concerns about overutilization, particularly for scans with higher potential for unnecessary use. The study contributes to understanding the diffusion of medical devices, complementing global literature on the adoption of technologies.

Ind-351 Investigating Consumer Preferences and Experiences of Allied Health Telehealth Services in Australia

PRESENTER: **Feby Savira**, Deakin University
AUTHORS: Madison Frith, Deniz Senyel, James Boyd, Richard Norman, Suzanne Robinson

Introduction: Since the COVID-19 pandemic, telehealth usage has surged, yet little is known about consumer preferences and experiences with telehealth in allied health practice. Existing studies primarily focus on general practice and broader primary care. Given the significant role of allied health professionals within the Australian healthcare system, this study aims to explore consumer preferences and experiences with telehealth in allied health.

Methods: This three-phase, mixed-methods study comprises: (1) two literature reviews on (a) allied health telehealth studies and (b) discrete choice experiments (DCEs) examining telehealth preferences; (2) focus group discussions exploring consumer attitudes and experiences; and (3) a DCE via online survey targeting the general population. Insights from Phases 1 and 2 informed the DCE, which will elicit consumer preferences for allied health services delivered through telehealth or face-to-face, using hypothetical scenarios with varied attributes.

Findings: The allied health telehealth review identified similar advantages and disadvantages across specialties, such as increased convenience but a reduction in personal connection and hands-on care. The DCE review showed a general preference for face-to-face consultations, though telehealth is valued when it reduces costs, shortens wait times, or is part of comprehensive care. Focus group findings revealed that telehealth experiences in allied health vary by health condition, technological literacy, and provider-patient relationships, with suitability differing across disciplines. Key considerations included accessibility, appointment quality, technological barriers, and specific needs of underserved groups. The DCE is scheduled for completion in January 2025.

Implications/Key Message: This study will provide insights to guide the development of allied health telehealth services that align with community needs and expectations.

Ind-916 Can Online Replace Offline? -- Study on the Substitutability of Online Consultation for Offline Diagnosis and Treatment

PRESENTER: **YuXin Liu**
AUTHORS: ZHANG YAN, ZhiYong LIU, Sixian Du

Abstract

Objective Evaluating the implementation effect of the online consultation. Exploring the mechanism of how it works in the process of diagnosis and treatment. And assessing its substitution for offline diagnosis and treatment. On this basis, discussing the optimization and promotion of this medical consultation pattern and giving corresponding policy recommendations.

Methods Inviting 36 physicians from different departments to co-construct an online consultation platform. Including 241 patients into this medical consultation pattern and randomly assigning them different offline personnel and equipment assistance conditions. Including 361 resulting medical cases as study samples for analysis. Firstly, using the stratified linear regression analysis method and the propensity score matching method separately to quantitatively explore the effects of the demand of the diagnosis and treatment tasks as well as the factors from different levels--such as the level of patients, physicians, and forms of medical treatment, on the suitability of the diagnosis and treatment tasks to the online scenario, and further on the completion of the diagnosis and treatment tasks. Then using the economic evaluation to quantitatively explore the benefits and costs for both physicians and patients participated. Finally conducting the semi-structured interviews with all parties involved to qualitatively analyze the advantages and disadvantages of their participation in this medical consultation pattern.

Results The study found that the suitability of the diagnosis and treatment tasks to the online scenario was significantly influenced by the demand of the diagnosis and treatment tasks and factors from the forms of medical treatment level, such as offline personnel and equipment assistance conditions, and further had a significant impact on the completion of the diagnosis and treatment tasks (all p-values <0.001). In addition, compared to offline diagnosis and treatment, online consultation was found to ease the financial burdens of medical treatment for patients while expose hospitals to potential losses of profit. Thus, patients were observed to be more willing to participate in this medical consultation pattern than physicians.

Conclusion Online consultation is able to achieve practical diagnostic and therapeutic effects. It demonstrates a certain degree of substitutability for offline diagnosis and treatment. The results suggest that the optimization of this medical consultation pattern can be considered in terms of the suitability of the diagnosis and treatment tasks to the online scenario. And the demand of the diagnosis and treatment tasks as well as the factors from the level of forms of medical treatment were found to be significant influencing factors of it. Therefore, measures such as accurately identifying patients suitable for online consultation, as well as equipping corresponding personnel and equipment assistance to the patient may be the key to optimize this medical consultation pattern. In addition, the inherent characteristic of online consultation that harms the benefits of the supply side while subsidizes the costs of the demand side also poses certain challenges in its future promotion process.

Keywords Online consultation; Medical consultation pattern; Performance evaluation; Policy recommendation

Ind-1113 Impact of National Volume-based Drug Procurement on Pharmaceutical Innovation in China: a Difference-in-differences Analysis

PRESENTER: **Zheng Zhu**
AUTHORS: Jiawei Zhang, Li Yang

Background In 2019, the Chinese government launched the national volume-based procurement (NVBP), a novel pooled procurement, intending to establish a market-oriented pricing mechanism. The prices of drugs have decreased significantly, and it remains unclear whether this will suppress innovation in the pharmaceutical industry. Sustained pharmaceutical innovation is crucial for addressing unmet patient needs. This study aimed to explore whether NVBP promotes innovation in the pharmaceutical industry. **Methods** Under the theory of change framework, this study provides a theoretical analysis of the mechanisms and potential effects of the NVBP. Using a multi-period difference-in-differences (DID) model and event study method, we analyze financial data from listed companies and patent data, with the research period spanning from December 31, 2014, to December 31, 2023. We examined the impact of the NVBP on the R&D investment amount, R&D intensity, number of R&D personnel, and number of invention patents of pharmaceutical listed companies. We also examined the heterogeneity in terms of the type of enterprise, firm size, and geographical location. **Results** After the implementation of NVBP, the multi-period difference-in-differences model indicated that the R&D investment amount in pharmaceutical listed companies affected by the policy rose by 86 million yuan, R&D intensity grew by 2.06%, the number of R&D personnel increased by 86, current period expensed R&D expenditure increased by 99 million yuan, capitalized R&D expenditure in the current period increased by 28 million yuan, and the number of invention patents grew by 12, with statistically significant. Subgroup analysis results show that the impact of the NVBP on R&D innovation in pharmaceutical companies is more significant in private enterprises and large companies, as well as in companies located in the western and eastern regions. **Conclusion** This study provides evidence that the NVBP policy was associated with pharmaceutical innovation. Although the NVBP has significantly reduced drug prices, it has fostered pharmaceutical innovation by intensifying market competition and creating a favorable environment that pressures pharmaceutical companies to increase investment in R&D innovation. This is of significant importance for enriching the supply of innovative drugs and meeting patients' unmet needs.

Ind-1593 Volume-based Procurement and Pharmaceutical Innovation

PRESENTER: **Lai Yi**
AUTHORS: Fu Hongqiao, Chen Fanghao

Background: Enhancing drug affordability while preserving pharmaceutical innovation often presents conflicting objectives. In recent years, competitive bidding is increasingly popular among both developed and developing countries due to its effectiveness in promoting drug affordability. The study examines the trade-off by evaluating the effects of the National Volume-Base Procurement (NVBP) on pharmaceutical innovation in China. NVBP is a procurement policy that combines competitive bidding with guaranteed large-scale purchases for off-patent drugs. Since 2018, China has carried out ten rounds of NVBP, leading to price reductions of over 50%. **Method and Data:** Utilizing a generalized difference-in-differences design and event study design, the study investigates how domestic pharmaceutical firms react to NVBP by analyzing comprehensive patent application and clinical trial data from these companies. We employ several datasets, including patent applications, clinical trials, drug sales, and ownership of pharmaceutical companies, a list of approved drugs in China market, and a list of NVBP tendering results. The time period of these data is from January 2017 to December 2023. Data of patents and clinical trials covers the whole sample of domestic pharmaceutical companies, which is from the State Intellectual Property Office and the National Medical Products Administration, respectively. **Preliminary Results:** In our early version of working paper, we utilized the data sample of patents and clinical trials from 2017 to 2021. We found that the inclusion of a drug in NVBP results in a 0.016 (16.6%) reduction in application of invention patents for the companies producing it, with winning bidders experiencing a further decline. The impact of NVBP becomes evident one year after its implementation. We find the NVBP has no significant impact on clinical trial behaviors, which might be attributed to time delay effect. Surprisingly, we also find that companies maintain their total sales revenue despite a substantial decrease in the sale value of procured drugs. This suggests that the revenue mechanism cannot fully explain the considerable decline in early pharmaceutical innovation, indicating that market structure plays a crucial role. But when we currently extend time period from 2017 to 2023, we found the number of early stages clinical trials has risen mildly. We haven't finished the cleaning of patent's dataset, yet. But in a coarse regression, we still found the NVBP reduced number of applications of invention patents in overall sample. Consistent with the new results of clinical trials, we found pharmaceutical companies with experiences of innovative drug R&D have responded to NVBP by increasing patent application. **Discussion and Implication:** Overall, our results suggest that the large price reduction on off-patent drugs brought by the procurement is associated with a large reduction in pharmaceutical innovation, which indicates a salient tradeoff between drug affordability and future innovative drugs. But the preliminary results in our current version suggest a divergence of pharmaceutical innovation, and the direction of drug procurement on pharmaceutical innovation depends on the countervailing power of escaping competition effect and the Schumpeterian effect. **Keywords**: competitive bidding, pharmaceutical innovation, drug prices

Ind-2431 Analyzing the Relationship Between IT Perception, Value Co-creation Behavior, and Medical Care Satisfaction Among Chronic Disease Patients

PRESENTER: **Jing Liu**
AUTHORS: Kuanlie Jiang, Wei Lu

Background: Patient satisfaction is one of the key outcome indicators of chronic disease healthcare service quality. However, research exploring its influencing factors from the perspectives of information technology perception and value co-creation remains limited. This study aims to explore the relationships between information technology perception, value co-creation behavior, patient trust, and patient satisfaction with medical care among chronic disease patients in Chinese communities. Additionally, it investigates the mediating role of value co-creation behavior between information technology perception and patient satisfaction, as well as the moderating role of patient trust in the relationship between value co-creation behavior and patient satisfaction.

Methods: A cross-sectional survey was conducted from September 2019 to December 2019 in Wuhan and Taiyuan, China. Participants were selected using a multistage stratified random sampling method. Data were collected via self-administered questionnaires from 722 chronic disease patients in Wuhan and Taiyuan (with a response rate of 90.36%). Patient satisfaction with medical care was measured using a four-item scale. Information technology perception was assessed using scales for perceived ease of use and perceived reliability, adapted from Deng Chaohua et al.'s measurement of mobile banking system perception. Value co-creation behavior was measured using a 21-item scale adapted from Yi and Gong's measurement of customer value co-creation behavior, and patient trust was measured using a four-item scale. Pearson correlation analysis was used to assess the relationships among perceived ease of use, perceived reliability, value co-creation behavior, patient trust, and patient satisfaction. Structural equation modeling (SEM) was employed to examine the hypothesized relationships among these variables.

Results: The proposed model demonstrated good model fit. Perceived ease of use (β=0.339, P<.001) and value co-creation behavior (β=0.459, P<.001) had direct positive effects on patient satisfaction, while perceived reliability (β=0.049, P=.520) did not have a direct effect on patient satisfaction. Perceived ease of use (β=-.746, P<.001) had a direct negative effect on value co-creation behavior, whereas perceived reliability (β=0.408, P<.001) had a direct positive effect on value co-creation behavior. The relationship between perceived ease of use (β=-0.342, P<.001), perceived reliability (β=0.187, P<.001), and patient satisfaction was indirectly influenced by value co-creation behavior. The mediating role of value co-creation behavior in the relationships between perceived ease of use (β=-0.075, P<.001), perceived reliability (β=0.034, P<.001), and patient satisfaction was negatively moderated by patient trust.

Conclusions: Our study elucidates the pathways linking perceived ease of use, perceived reliability, value co-creation behavior, patient trust, and patient satisfaction with medical care. The findings indicate that perceived ease of use and value co-creation behavior significantly influence patient satisfaction, while perceived ease of use and perceived reliability significantly impact value co-creation behavior. The influence of perceived ease of use and perceived reliability on patient satisfaction can be mediated by value co-creation behavior, and the impact of value co-creation behavior on patient satisfaction is moderated by patient trust.

Bali International Convention Centre – Bali

Trade-Offs in Vaccine Programming

MODERATOR: **Josephine Walker**,

Ind-346 Cost-Effectiveness and Benefit-Risk of Rotavirus Vaccination in Afghanistan: A Modelling Analysis Informed by Post-Licensure Surveillance

PRESENTER: **Palwasha Anwari**
AUTHORS: Frédéric Debellut, Clint Pecenka, Andrew Clark

Introduction Afghanistan added ROTARIX to the routine national immunization programme in 2018. We aimed to estimate the cost-effectiveness and benefit-risk of ROTARIX and compare its continued use with other rotavirus vaccines that could be used in the future. **Methods** We used a static cohort model with a finely disaggregated age structure (weeks of age <5 years) to assess the use of ROTARIX (1-dose vial) over a seven-year period (2018-2024) in Afghanistan. The primary outcome measure was the discounted cost (2022 US$) per Disability Adjusted Life Year (DALY) averted (from government and societal perspectives) compared to no vaccination. We also calculated the benefit-risk ratio i.e., the number of RVGE deaths prevented per one excess intussusception death. Model inputs were informed by pre- and post-licensure surveillance data, new analyses of household survey data, and updated estimates from the international literature. We ran a separate analysis to compare the potential cost-effectiveness and benefit-risk of ROTARIX (1-dose vial), ROTASIIL (1-dose vial), ROTASIIL (2-dose vial), and ROTAVAC (5-dose vial) over a ten-year period (2025-2034). Each product was compared to no rotavirus vaccination and each other. We ran deterministic and probabilistic uncertainty analyses and interpreted our results over a range of cost-effectiveness thresholds. **Findings** We estimated that routine use of ROTARIX between 2018 and 2024 has prevented 4,600 RVGE deaths (a 41% reduction), 86,400 hospital admissions, and 1.72 million outpatient visits. For every 1,493 RVGE deaths prevented by the vaccine, we estimated one potential excess intussusception death. With a heavily reduced vaccine dose cost (Gavi's support) the net cost to the Afghanistan government vaccine programme was estimated to be US$ 4.4 million per year. The cost per DALY averted was US$ 125 (0.25 times the national GDP per capita) when using a Gavi-subsidised vaccine cost and including household costs averted by vaccination. This increased to US$ 471 (0.94 times the national GDP per capita) when incorporating the full vaccine price without Gavi's subsidy and excluding household costs averted by vaccination. When assuming continued Gavi support over the period 2025-2034, the dominant product would be ROTARIX. Without Gavi support, ROTASIIL (2-dose vial) dominates. **Conclusion** Our study supports the sustained use of rotavirus vaccination in Afghanistan. The rotavirus vaccine is cost-effective and is health benefits greatly exceed its potential health risks. **Keywords:** Rotavirus vaccine; Cost-utility; Cost-effectiveness; Benefit-risk; Afghanistan

Ind-1558 Evaluating Payment Models for PPSV23 Vaccine Introduction in a Pediatric Sickle Cell Disease Cohort in Burkina Faso: A Budget Impact Analysis

PRESENTER: **Emmanuel Fulgence Drabo**, Johns Hopkins University
AUTHORS: Iman Nourhussein, Cynthia L. Gong

Background and Objective: Sickle cell disease (SCD) is a leading cause of morbidity and early mortality in Sub-Saharan Africa's "meningitis belt," particularly among children under five. Compromised immunity in children with SCD increases their risk of pneumococcal infections. In Burkina Faso, meningitis-related fatality in infants with SCD is about 19%, with higher risks among those unvaccinated, highlighting the need for pneumococcal vaccination. Since 2013, Burkina Faso's immunisation program has included the 13-valent pneumococcal conjugate vaccine (PCV13), covering 13 *Streptococcus pneumoniae* serotypes. However, children with SCD remain vulnerable to additional serotypes despite completing PCV13. Guidelines now recommend adding the pneumococcal polysaccharide vaccine (PPSV23) after PCV13 for high-risk individuals, but high costs and limited budgets have hindered its introduction. With countries increasingly expected to share healthcare costs, strategies to enhance affordability are crucial. This study evaluates the budget impact of adding PPSV23 for children with SCD after PCV13, comparing four payment models to assess affordability and cost savings from government and funder perspectives.

Methods: A 5-year budget impact analysis using a decision-tree model compared two scenarios — PCV13 alone versus PCV13+PPSV23 — in a cohort of 13,959 infants ≤5 years. PPSV23 uptake was calibrated to current PCV13 coverage. Four payment models were evaluated: 1) a one-time payment (OTP) model with the full cost paid upfront in year 1; 2) a "Costco" model with a 50% upfront "membership" fee in year 1 and a 10% annual per dose usage fee thereafter; 3) a mortgage-based payment (MBP) model with fixed, equal annual installments paid over 5 years plus interest based on government bond rates (~7.2%); and 4) an outcomes-based model with payments tied to vaccine effectiveness, reimbursing full vaccine costs per pneumococcal infection within the expected vaccine protection period (~4 years). Epidemiological and clinical inputs came from the literature and burden-of-disease studies, healthcare costs from cost studies and WHO databases, and vaccine costs from GAVI and the literature. SCD screening and management costs were excluded, assuming they were pre-established. Costs were adjusted to 2024 USD and discounted at 3% annually. One-way sensitivity analysis tested result robustness and identified key drivers.

Results: Over five years, adding PPSV23 to PCV13 for children with SCD saved $15.75 million under the OTP model. The Costco model achieved the highest savings ($15.80 million, or $57,308 more than OTP). The MBP and outcome-based models saved $15.73 million and $15.72 million (i.e., $20,662 and $25,929 more than OTP), respectively. Nearly all of these cost savings accrued to the government, in the form of cost offsets from avoided adverse health events. Key drivers of the budget impact included the case-fatality ratio, probabilities of invasive pneumococcal disease and non-meningitis non-pneumonia, and vaccine uptake in year 1.

Conclusion: Alternative payment models can enhance the affordability of PPSV23 introduction in high SCD and Streptococcus pneumoniae

prevalence settings, such as Burkina Faso, by distributing costs over time. Policymakers and funders of childhood immunization programs may consider these strategies to support broader vaccine implementation within limited healthcare budgets, improving health outcomes in high-risk pediatric populations.

Ind-1823 Reaching Zero-Dose Children in Angola: The Cost of Inaction

PRESENTER: **Getaendale Simesh Ayele, PhD**
AUTHORS: Renzo Efren Sotomayor Noel, Soazic Elise wang sonne

Background In 2022, Angola found itself among the top 10 countries globally with the highest number of zero-dose children, a situation that demands urgent attention. The lack of adequate government investment in vaccines and immunization is a key factor contributing to this alarming statistic. In 2021, the government of Angola allocated only US$ 28.7 million (KZ 18.3 billion) to routine immunization, equivalent to US$ 28.9 per surviving infant (KZ 18.4 thousand) that year. This figure falls below the WHO Sub-Saharan Africa Average spending between 2018 and 2020, estimated at US $ 41 per surviving infant, as per UNICEF's recent report. Our study is designed to assess the cost-effectiveness of a vaccination program for children in Angola from 2025 to 2029 and to urgently inform the health ministry of Angola about the need for increased resources for the immunization program. **Methods** Using the latest data from UNICEF on vaccine costs per dose and from WHO on the estimation of target groups, as well as projections from 2025 to 2029 with the National Immunization Strategy costing application (NIS.COST) and Lives Saved Tool (LiST) on vaccine costs per dose, vaccine delivery costs, and the number of lives to be saved with the vaccine intervention, we empirically quantify the economic benefits the government could reap from saving lives by devoting sufficient domestic financial resources to immunization. **Results** Our study, based on a range of assumptions and scenarios on the delivery cost of vaccines and coverage rates, reveals promising results. On average, a dollar invested in fully immunizing a child in Angola translates into a gain ranging between $1.09 to $1.34, with an annual internal rate of return ranging from 17% to 47%. The cost of inaction, on the other hand, could lead to an estimated loss of lives, around 15480 within the next five years. However, the lives saved through the immunization program from 2025 to 2029 are projected to have a net benefit worth 0.1% share of Angolan GDP, offering a beacon of hope for the future. **Conclusion** Therefore, it is not just a matter of health policy, but also a moral imperative to ensure that every child in Angola has access to routine immunization. This is a fundamental right that the government of Angola should uphold. To achieve this, the government must identify potential sources of fiscal space for immunization financing in the country, thereby saving the lives of the next generation of children and respecting their rights. **Keywords:** cost, zero-dose, immunization

Ind-2495 Exploring the Costs of In-Patient and Out-Patient Costs of Respiratory Disease and the Cost of the Influenza Immunization Program in Armenia

PRESENTER: **Stacie Gobin**
AUTHORS: Michael Kusi Appiah, Gayane Sahakyan

Background: Despite the substantial global impact of influenza, there are limited economic data to guide influenza vaccination programs investments in middle-income countries. We measured the societal costs of influenza and the costs of conducting an influenza vaccination program in Armenia.

Methods: During December 2022 through March 2023, retrospective cost data were collected from case-patients and healthcare providers through structured questionnaires at 15 healthcare facilities selected through stratified sampling using a societal perspective. In Armenia, influenza-like-illness (ILI) case-patients are treated in polyclinics (outpatient clinics offering both general and specialty medical care) daily but return to their homes nightly; severe acute respiratory illness (SARI) case-patients are admitted to hospital for treatment. Vaccination program costs from the 2021-2022 influenza season were identified using accounting records and categorized as: planning, distribution, training, social mobilization, supervision, procurement, and monitoring, and national- and facility-level administration and storage. These aggregated categories were used by default, as a consequence of the cost categories in the retrospective cost data available. While both financial and economic costs were included in the cost of illness estimate, only financial costs were included in the cost of the vaccine program.

Results: Staff enrolled 42 ILI and 873 SARI case-patients. SARI patients were admitted for a mean of 9.2 days. ILI patients were treated daily in clinic during their illnesses for a mean of 6.4 days. The mean costs per episode for SARI and ILI case-patients were $823.6 and $616.57, respectively. The societal cost per episode included direct (medical and non-medical costs) and indirect costs (productivity losses). Costs related to influenza surveillance were not included. Healthcare service costs were the largest direct expenses for ILI and SARI case-patients. In 2021, Armenia purchased 170,000 quadrivalent inactivated influenza vaccine doses in multidose vials ($7.73 per dose for procurement costs alone). Total costs of the 2021-2022 influenza vaccination program to the government were $4,353,738, with the largest costs associated with national-level administration and storage (30%) and facility-level vaccine administration and storage (65%). The total cost per dose administered was $25.61. Since the average cost of purchase per vaccine (from the manufacturer) during the 2021-2022 influenza season was $US 7.73, the marginal administration cost per dose was $US 17.88.

Conclusions: These data on the costs of seasonal influenza prevention programs and the societal and economic costs of influenza illness in Armenia may inform national vaccine policy decisions in Armenia and may be useful for other middle-income countries. Influenza vaccines, like other vaccine programs, are recognized as substantially contributing to the reduction disease burden and associated mortality and further driving economic growth. These findings suggest that the influenza vaccine, at a cost of $25.61 per dose administered could offer a substantial cost-savings over influenza treatment, at a cost of over $616.57-823.6 per episode depending on level of severity. However, a formal cost-effectiveness analysis should be performed once the burden of disease data is available.

Bali International Convention Centre – Bandung

New Methods to Measuring Health Inequalities across the Globe

MODERATOR: **Erin Strumpf**,

Ind-319 Decoding Health Disparities: Gender, Ethnicity, & Chronic Diseases in Latin Americans with Individual Data & Machine Learning

PRESENTER: **Carlos Chivardi**
AUTHORS: Ana L. Moncayo, Davide Rasella, Alejandro Zamudio Sosa, Daniella Medeiros Cavalcanti, Philipp Hessel, José Alejandro Ordoñez, Cristina Almeida

Abstract

Background. Chronic diseases, such as cardiovascular disease, diabetes, and respiratory conditions, disproportionately affect certain ethnic and gender groups, leading to substantial health disparities. In Latin America, these disparities are exacerbated by social determinants like education, employment, and access to essential services, but the extent and drivers of these disparities are not fully understood. Addressing these inequities requires insights into how specific social determinants influence chronic disease risk across diverse populations. This study aims to shed light on these drivers by exploring the impact of socioeconomic and environmental factors on chronic disease diagnoses across gender and ethnic lines in three Latin American countries: Brazil, Mexico, and Ecuador.

Methods. We conducted an analysis using data from 96,726,891 adults, obtained from national health surveys carried out in Brazil, Mexico, and Ecuador between 2018 and 2019. Our primary variables included education level, occupation, and access to essential services such as sewage, piped water, and garbage collection, as well as demographic data on ethnicity and gender. To model the complex relationships between these variables and chronic disease outcomes, we employed random forest machine learning models. This method allowed us to capture nonlinear patterns in the data and assess the predictive power of each social determinant for different gender and ethnic groups.

Results. Our models revealed substantial disparities in chronic disease risk linked to both ethnicity and gender. Notably, predictive accuracy was highest for indigenous and black individuals, underscoring the inequities these groups face in relation to chronic disease burden. Education was the most influential predictor for women, with model performance dropping by 48.2% when education data was removed. This suggests that access to education plays a crucial role in chronic disease prevention for women, likely through its impact on health literacy, health behaviors, and economic stability. In contrast, occupation was the stronger predictor for men, with a 29.7% reduction in model performance when occupation data was excluded. This finding highlights the influence of occupational factors—such as job stability, work conditions, and associated stress—on men's chronic disease risk.

Conclusion. Our results have significant implications for public health policy. They highlight the need for gender- and ethnicity-sensitive strategies in Latin America. For women, policies focused on improving access to education may help mitigate chronic disease risk, while for men, initiatives promoting stable and safe employment opportunities may be particularly beneficial. Moreover, our findings underscore the need to address basic service inequities in indigenous and black communities, where lack of access to sewage, clean water, and waste management contributes to poor health outcomes and elevates chronic disease risk.

This study provides new insights into how social determinants shape chronic disease risk in Latin America, emphasizing the need for targeted public health interventions. By addressing the unique needs of different gender and ethnic groups, policymakers can make meaningful progress toward reducing health disparities.

Ind-1177 A Distributional Regression Approach to Socioeconomic Inequalities in Infectious Diseases in the UK

PRESENTER: **Murong Yang**
AUTHORS: Julie Robotham, Nam Nguyen, A.Sarah Walker, Edwin van Leeuwen, Koen Pouwels

Background

High infection incidence causes a major burden on public health, with evidence suggesting that socioeconomically disadvantaged groups may face greater impacts. Understanding and explaining socioeconomic inequalities in healthcare utilisation for infectious diseases has important implications for health and social policy. Conventional regression models primarily capture the effect of socioeconomic factors on the mean of health outcomes, potentially overlooking critical distributional aspects across socioeconomic factors, such as variability and asymmetry. We use a distributional regression approach to examine and decompose socioeconomic inequalities in the incidence of primary care consultations for a wide range of common infections.

Methods

We analysed patient-level data from January to December 2019 using the Clinical Practice Research Datalink, a large electronic database of primary care records across the UK. We assessed the incidence of consultation for a wide range of common infections, including chronic obstructive pulmonary disease (COPD) exacerbations, asthma exacerbations, lower and upper respiratory tract infections, gastroenteritis, urinary tract infection, pyelonephritis, prostatitis, acute otitis media, otitis externa, cellulitis, and impetigo. Socioeconomic status was measured by the Index of Multiple Deprivation (IMD), a geographic area-based measure of deprivation level. We first calculated the age-

standardised incidence of infection-related primary care consultations by IMD quintile. We then used a distributional regression approach within the Generalised Additive Models for Location, Scale, and Shape (GAMLSS) framework to quantify the relationship between deprivation and incidence of consultation for infection. We specified a zero-inflated Sichel distribution in the GAMLSS model, incorporating four distributional parameters to capture the effect of deprivation on the mean, variance, skewness, and kurtosis of the incidence distribution. Subsequently, we explored the role of smoking prevalence and vaccination coverage in explaining observed socioeconomic inequalities.

Results

The analysis included 6,973,213 patients. Age-standardised incidence of consultation for infection was consistently higher for patients living in more deprived areas across most infections, except for prostatitis and impetigo. The GAMLSS model showed that higher deprivation was associated with higher mean incidence of consultation for COPD and asthma exacerbations, respiratory tract infections, otitis media, otitis externa, and cellulitis, controlling for age, sex, and ethnicity ($p<0.01$). We also found that higher deprivation was associated with lower variance of the incidence of consultation for COPD and asthma exacerbations, and upper and lower respiratory infections, indicating lower variability in the incidence of these infections in more deprived areas ($p<0.01$). Smoking prevalence and influenza vaccination coverage partially explained patterns of inequality in consultations for respiratory infections.

Conclusions

This study highlights the benefit of a GAMLSS approach in health inequality research, as it captures distributional insights that are critical for effective policy interventions. A higher incidence of infection-related consultations and lower variability among individuals in more deprived areas suggest a consistently high infection burden within these populations, especially for respiratory-related infections. Targeted policies aimed at reducing socioeconomic inequalities may reduce the burden of infectious diseases in deprived communities, particularly for respiratory infections. Efforts to prevent smoking and increase influenza vaccination coverage may help narrow these health inequalities.

Ind-2265 Assessing Cardiovascular Disease Vulnerability in India: A District-Level Index-Based Analysis

PRESENTER: **Gayathri Balachandran**
AUTHOR: Ramna Thakur

Background: Cardiovascular diseases (CVDs) have emerged as a critical public health challenge in the world, with millions being affected annually. LMICs are disproportionately affected by CVDs, as they are responsible for 80% of all cardiovascular deaths worldwide. It is also concerning in India, where in 2016, non-communicable diseases (NCDs) accounted for 63% of all fatalities, with cardiovascular diseases (CVDs) accounting for 27% of these deaths. Risk factors such as comorbidities, unhealthy eating habits, sedentary lifestyles, and environmental exposures are becoming more common, which makes some populations more vulnerable, particularly in areas with inadequate access to healthcare. ***Aim:*** The aim of this study is to develop a regional Cardiovascular Vulnerability Index (CVI) for India. This will enable focused public health interventions by identifying hotspots of vulnerability across Indian districts and offering a thorough and integrated understanding of the various factors causing CVD. ***Data & Methodology:*** The analysis integrates data from diverse sources, including the National Family Health Survey's 5th round (NFHS-5, Rural Health Statistics 2021-22, and the Census of India. Using 21 indicators across six domains such as socio-demographic, epidemiological, behavioural, dietary, healthcare and living environment, a domain-specific and overall vulnerability index was generated for 707 districts in India. Indicators were normalised using a linear maximum-minimum method, with equal weights assigned within each domain. Domain-specific scores were computed using maximum-likelihood-based factor analysis in domains with more than two indicators or arithmetic means for domains with only two indicators. These were then aggregated into an overall CVI score with equal weightage. ***Results:*** The findings reveal that districts in the eastern and northeastern regions such as Pakur, Sukma, West Khasi Hills, East Jantia Hills, West Karbi Anglong, Dumka, Mayurbhanj, West Jaintia Hills, Pashchimi Singhbhum, and South West Khasi Hills exhibit the highest vulnerability, possibly driven by limited healthcare access, socioeconomic disadvantages, unhealthy dietary patterns. Conversely, districts in western India, such as Kota, Surat, Pali, Bhopal, Jodhpur, Jaipur, Sabar Kantha, Anand, Navsari, and Gwalior, have the lowest vulnerability, benefiting from better healthcare infrastructure and greater health awareness. Notably, certain hotspots were also identified in parts of Kerala and Jammu & Kashmir as well, likely due to the prevalence of lifestyle diseases and dietary habits. ***Conclusion & Policy Implications:*** These findings emphasise the need for targeted, region-specific public health policies and interventions to reduce CVD vulnerability and its associated health burden. Strengthening healthcare infrastructure through mobile health clinics or telemedicine services and launching region-specific awareness campaigns on CVD risk factors is imperative. By addressing these challenges, the CVI serves as a critical tool for identifying and mitigating vulnerabilities at a regional level in India, facilitating the development of equitable and effective public health policies aimed at reducing the burden of CVDs in the country.

Ind-2311 Health in the Digital Economy: Unclouding Inequalities Among Online Platform Workers

PRESENTER: **Marcel Bilger**, Vienna University of Economics and Business
AUTHORS: Maddalena Josefin Lamura, Barbara Haas, Dominik Klaus, Julian Kettl

A growing number of self-employed workers are finding work through online platforms that act as intermediaries between the workers and their clients. While intermediation is readily apparent in location-based services, it is also becoming increasingly prevalent in desk work. Such online platform work, however, has little visibility and remains under-researched. This research gap is important because online platform work generates very different working conditions than more traditional, office-based employment. On the one hand, greater flexibility may allow workers to better optimize the use of their private time. On the other hand, the lack of clear boundaries between private and professional life and of contractual and social protection may also pose a significant threat to their physical and mental health and well-being.

This research contributes to the literature by analyzing inequalities in health, burnout risk, and well-being among workers from a wide range of online platforms, from high-end (macro) work to click (micro) work. In particular, this research aims to explain these inequalities using novel

measures of working conditions that we developed by adapting the Employment Precariousness Scale (EPRES) to platform work using exploratory factor analysis.

We surveyed nearly 2,000 German-speaking online platform workers by inviting them to participate in the study through the platforms where they were active, using a stratified design to ensure that a variety of platform types were observed in sufficient numbers. Our outcome measures are self-rated general health, presence of chronic physical health problems, presence of chronic mental health problems, the Burnout Assessment Tool (BAT), and the 8-item Well-Being Flourishing Scale. We then conducted multivariate regression analyzes to measure the association between the outcome variables and platform type, working conditions, and socioeconomic factors, while controlling for potential confounders using a variable indicating whether health was a motive to engage in platform work. In addition, we tested the robustness of the results to the inclusion/exclusion of potentially endogenous control variables, such as working hours and off-platform work.

While we did not find significant differences in general health and burnout risk, we found that people who work on micro-platforms are 7.4 percentage points more likely to suffer from chronic physical problems, 5.8 percentage points more likely to suffer from chronic mental health problems, and 3.2 points lower in well-being than those who work on macro-platforms. Working conditions and socioeconomic variables are key, as outcome differences between platform types are no longer statistically significant when these factors are controlled for. Lower ability to take time off and vulnerability to unfair pay and non-transparent ratings have a significant negative impact on self-reported general health and well-being. However, higher ability to take time off is also associated with a higher burnout risk that is mediated by higher emotional distress from self-time management.

We conclude that the socioeconomic gradient in health between workers from different types of online platforms is partly related to specific working conditions. Our research suggests that health inequalities could be reduced by providing workers with better protections in terms of time management, fair pay, and rating transparency.

Ind-762 Predicting Changes in U.S. County Health: What Does Machine Learning Tell Us About Multiple Determinants of Health

PRESENTER: **Di Yang**
AUTHOR: David Vanness

Background: Although a growing body of literature suggests that investing in multiple determinants of health (health care, socioeconomic and behavioral determinants) at community level is an effective approach to improving population health, few studies have investigated the relative contribution and elasticity of each health determinant at the county level, which is crucial for policymakers to prioritize investments among the multiple determinants of population health.

Methods: We used machine learning methods to investigate the temporal relationship of socioeconomic, health care, and behavioral determinants of health with premature mortality in United States counties. Using data from the County Health Rankings, we estimated a population health production function with the Extreme Gradient Boosting (XGBoost) algorithm, which allowed for a flexible functional form (interaction terms, non-linearities, polynomial orders, etc.) We used 2010-2014 change rates and baseline levels of health determinants to predict 2015-2019 changes in years of potential life lost (YPLL) at the county level. Moreover, we estimated the percent change in YPLL per percent change in each of the pre-period multiple determinants (elasticities). The examined county-level health determinants included racial economic disparities, unemployment, uninsurance, child poverty, primary care physicians per 100,000 population, obesity, physical inactivity (percentage of adults reporting no leisure-time physical activity), some-college attendance (percentage of adults aged 25-44 with some post-secondary education), and high school graduation rates.

Key findings: The 2010-2014 baseline levels of obesity, physical inactivity, and unemployment were the three strongest predictors of 2015-2019 changes in YPLL. Estimated elasticities indicated that a one percent reduction in baseline levels of obesity, physical inactivity, and unemployment predicted a 0.72, 0.37, and 0.28 percent reduction in the 2015-2019 trends in YPLL, respectively, averaged across all counties. Elasticities varied based on each county's baseline levels of health determinants.

Conclusions and implications: Policymakers seeking to maximize the impact of investments to reduce premature mortality may wish to prioritize policies targeted towards changing those determinants that predict the largest improvements per dollar spent. On a national basis, our analysis suggests those determinants are most likely obesity, physical inactivity, and unemployment. Additionally, our analysis shows that the relative elasticity of these determinants is likely to vary across U.S. counties according to their baseline levels, which suggests that different counties may wish to prioritize policies targeting different determinants.

3:30 PM –5:00 PM TUESDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Executive Room 1

Performance Evaluation of Social and Health Policies

MODERATOR: **Josefa Henriquez**,

Ind-1439 The Impact of Fiscal Policies to Promote Healthy Diets on Birth Outcomes: Evidence from the Navajo Nation

PRESENTER: **John Cawley**, Cornell University
AUTHORS: Mallory Dreyer, Kosali Simon

Many governments worldwide use fiscal policy to promote healthy diets. In most cases it is relatively narrow and takes the form of a tax on sugar-sweetened beverages (SSBs). In contrast, the Navajo Nation adopted one of the most comprehensive such policies in the world in 2014-15. The Navajo Nation is the largest Native American reservation in the U.S., consisting of roughly 27,000 square miles, making it larger than ten states. The USDA classifies much of the Navajo Nation as a food desert, and roughly three-quarters of its residents are food insecure. Motivated by a concern about poor diets and the associated chronic disease, the Navajo Nation Council enacted two policies: 1. Healthy foods and drinks (including fresh fruits and vegetables, and water) were exempted from the 5% sales tax. 1. Foods and drinks of minimal-to-no nutritional value (including SSBs, candy, baked goods, ice cream, and chips) were taxed an additional 2% on top of the existing sales tax. Together, these two policies are referred to as the Healthy Dine' Nation Act (HDNA), and they create a 7% price wedge between healthy and unhealthy foods. In this paper, we examine the impact of the HDNA on birth outcomes. Infant morbidity and mortality, and maternal conditions like gestational diabetes, are more common among American Indian / Alaska Native (AI/AN) individuals than among non-Hispanic white individuals. Healthy nutrition is seen as an important mechanism for improving such outcomes. In order to estimate the impact of the HDNA on birth outcomes, we examine CDC birth certificate data for the U.S. for 2010-2018; i.e. for more than 3 years before to 3 years after the two components of the HDNA. We estimate difference-in-difference models and event studies that estimate the effect of the two components of the HDNA on a variety of birth outcomes: very low birth weight, low birth weight, gestational diabetes, gestational hypertension, and pre-pregnancy weight of mother. The treatment group consists of mothers who live in the counties of the Navajo Nation and whose self-reported race is or includes AI/AN. The comparison group consists of mothers whose self-reported race is or includes AI/AN but who live outside the three states that include the Navajo Nation (AZ, NM, UT). (As a robustness check, we also use a second control group, which are mothers who are not AI/AN (nor are the fathers) who live in the three states that include the Navajo Nation (AZ, NM, UT) but who live in counties outside the Navajo Nation.) We hypothesize that the HDNA, given that it was designed to promote healthy diets, improved infant and maternal health outcomes. The comprehensive nature of the HDNA, as well as the prevalence of diet-related chronic disease among the Navajo Nation population, make this an important contribution to the evidence base.

Ind-2527 Impact of the Coal-to-Clean Heating Policy on Cardiometabolic Multimorbidity and Clean Fuel Adoption in Older Chinese Adults

PRESENTER: **Xian Zhang**

Impact of the Coal-to-Clean Fuel Policy on Fuel Adoption and Cardiometabolic Multimorbidity among Chinese Older Adults
Abstract **Background:** In 2015, the Chinese government introduced the Coal-to-Clean Heating Policy (CHP) to enhance air quality and public health nationwide. This initiative was expanded in 2017, prohibiting household coal burning and offering subsidies to support the transition to clean heating methods, such as electricity and gas. Studies have shown that the CHP has significant impacts on cardiovascular and cerebrovascular diseases. Building on this evidence, I aim to investigate whether the policy affects cardiometabolic multimorbidity (CMM) in affected populations. **Methods:** I included participants aged 60 and older recruited from the CHALRS (2011 to 2020). CMM was defined as the presence of at least two out of four conditions: hypertension, diabetes, heart disease, or cardiovascular disease. Cooking fuel and heating fuel were classified into three categories: coal fuel, gas, and electricity. The average treatment effect on the treated was estimated using difference-in-differences methods and instrumental variable difference-in-difference method. Logistic regression was employed to estimate odds ratios for dummy variable outcomes. The 2015 and ealier waves were regarded as the pre-treatment wave, and 2018 and 2020 were regarded as the post-treatment waves. All models were adjusted for demographic factors, socioeconomic status, and lifestyle behaviors. **Results:** Among 12,047 participants (mean age 68.7 years, female 51.7%), 761 newly diagnosed CMM patients were identified. I found that introducing the CHP was associated with a 5.95% reduction in the usage of coal fuel (95% CI: 0.71, 0.96; $p = 0.045$) and increases in the usage of gas and electricity fuel by 23.7% and 19.4% respectively, in cooking. The policy was associated with a significant 10.04% reduction in the odds of CMM (95% CI: 0.45–0.92, $p = 0.009$). **Interpretation:** The CHP significantly reduced coal fuel usage and promoted the adoption of cleaner heating methods among older adults in China. Moreover, the policy was associated with substantially reducing the odds of CMM among adults aged 65 and older, highlighting its potential to improve public health by mitigating chronic disease risks in affected populations. These findings underscore the importance of clean energy policies in addressing environmental and health challenges.

Ind-1528 Excessive Tobacco Taxes Fuel the Illicit Market and Undermine Health Benefits: Longitudinal Evidence from Australia

PRESENTER: **MohammadHossein Hadi**

AUTHORS: Maame Esi Woode, Dennis Petrie

Abstract

Excessive taxation on tobacco products aims to reduce smoking rates but may inadvertently stimulate illicit markets offering untaxed cigarettes, potentially undermining public health objectives. Illicit tobacco not only erodes tax revenues but may also pose heightened health risks due to unregulated production and content. This study provides the first empirical evidence linking these unintended consequences to smokers' health in Australia, where cigarette prices are among the highest globally.

We examine the impact of Australia's unexpected 2010 tobacco tax overhaul on smokers' engagement with the illicit tobacco market and subsequent health outcomes. Utilising a difference-in-differences event study design, we exploit spatial variation in pre-existing cigarette demand—which likely influenced the profitability and presence of illicit markets—to identify the effects of the tax increases. Our analysis employs a population-representative panel dataset that allows for individual-level estimation of cigarette purchase prices.

Our findings reveal that higher tobacco taxes are significantly associated with increased participation in the illicit tobacco market. Specifically, in SA3 regions where baseline per capita cigarette consumption was higher by one pack per week, the likelihood of smokers purchasing untaxed cigarettes increased by approximately 76%, and the quantity purchased rose by about 26% following the tax increases. Furthermore, heightened participation in the illicit market was associated with declines in smokers' physical health. The SF-6D Health State Utility Score decreased by nearly 0.01 points, and the SF-36 General Health Score declined by approximately 1.12 points (significant at the 10% level). No

significant effects were observed on mental health outcomes. These impacts are particularly pronounced among vulnerable groups, such as heavy smokers and residents of socio-economically disadvantaged areas. Our estimates also suggest that the illicit tobacco market contributes to an average annual government revenue loss of around A$3 billion.

These findings suggest that the public health benefits anticipated from higher tobacco taxes may be partially offset by unintended consequences, such as increased consumption of illicit cigarettes, which carry their own health risks and economic costs. This underscores the imperative for designing optimal tax policies that avoid becoming counterproductive by inadvertently fueling illicit markets.

Ind-1620 The Potential Impact of Taxation of Sugar-Sweetened Beverages in Mongolia

PRESENTER: **Mr. Lennert Veerman**, Griffith University
AUTHOR: Undram Mandakh

Background: The burden of obesity in Mongolia is high; more than 20% of the population has obesity. Consumption of sugar-sweetened beverages (SSB) is associated with overweight and obesity and a wide range of chronic diseases. Taxation of SSBs has been recommended as a policy to reduce sugar intake and obesity. Over 130 jurisdictions have now introduced taxes on SSBs to improve population health and/or generate revenue. To have a measurable impact, taxes that result in a consumer price increase of at least 20% are recommended. Mongolia currently applies a 10% sales tax on all non-alcoholic and sugar-sweetened carbonated drinks, but it does not have an excise tax on SSBs. In 2023, a Working Group on SSB taxation was appointed by the Parliamentary Standing Committee on Budget. Our study was conducted for the World Bank in support of this process. We modelled the potential impact of a SSB tax in Mongolia on health and health care spending. Scenarios of taxes that resulted in a 20%, 10% and 5% increases in the price of SSBs were examined. Methods: Using established proportional multi-state modelling methods, the current population of Mongolia was modelled over their remaining lifetime. Consumption data were from the Global Dietary Database (GDD), adjusted for sales volumes from Euromonitor. Euromonitor data were used to model the SSB consumption trend to 2034. Body mass estimates were from the Noncommunicable Disease Risk Factor Collaboration (NCD-RisC), with trend extrapolated to 2034. Disease epidemiology, demography and relative risks were from the Global Burden of Disease 2019. Disease costs were from the Health Insurance General Office. Economic outcomes were discounted at 3% per annum. Results: A tax on sugared drinks leads to health benefits that accrue over time. Over the first 25 years, a tax that results in a 20% increase in the consumer price is estimated to prevent >10,000 cases of obesity, >6,000 cases of type 2 diabetes mellitus, >8,500 cases of ischemic heart disease, ~3,000 cases of stroke, >300 cases of cancers and ~1.2 million tooth cavities, for an overall benefit of an additional 100,000 years of life lived in good health over the lifetime of the 2019 Mongolian population of 3.4 million. Over 25 years, reductions in health care expenditure of up to USD 0.8 million (0.1 million – 1.6 million) are projected. For a 5% tax, these results are about 64% smaller, and for a 10% tax, 44% smaller. If younger age groups continue to consume the same amount of SSBs as they get older rather than reducing their consumption as assumed, the health benefit could be about 100% larger. Conclusion: This analysis shows taxation of SSBs to have large benefits for population health and modest effects on health spending in Mongolia. These results were presented at a stakeholder meeting in Ulaanbaatar, April 2024. An SSB tax amendment in excise tax law passed the parliament in May. The law will enter into force on January 1st, 2027.

Ind-1716 Evaluating the Impact of Singapore's Nutri-Grade Beverage Labels on Prepackaged Beverage Purchases and Diet Quality: A Before and After Study

PRESENTER: **Soye Shin**, Duke-NUS Medical School

The global rise in obesity and non-communicable diseases (NCDs) presents a significant health challenge, with poor dietary intake as a major driver. In Singapore, one in nine individuals has diabetes, exacerbated by high sugar consumption, particularly from sugar-sweetened beverages. To address this, Singapore introduced the mandatory Nutri-Grade (NG) front-of-package (FOP) nutritional label for prepackaged beverages in January 2023, following a two-year grace period for manufacturers to adjust. NG grades beverages from A (healthiest) to D (least healthy) based on sugar and saturated fat content per 100 ml. Beverages are assigned a grade based on sugar content and may be downgraded (but never upgraded) based on saturated fat thresholds. The percentage of sugar in the beverage per 100ml is also displayed, with mandatory labels only for beverages graded C and D.

While prior studies suggest that FOP labels can positively influence consumer choices, most research regarding consumer's choices post-policy implementation rely on one-time controlled experiments, limiting insights into their long-term, real-world effects. Moreover, the impact of labelling policies on sugar-specific reformulation remains underexplored compared to nutrients such as sodium and fats.

This study addresses these gaps by evaluating the impact of NG on both consumer behavior and product reformulation. Using Nielsen longitudinal scanner data from 895 nationally representative Singaporean households, we analyzed beverage purchases before (April 2019-March 2020) and after (April 2023-March 2024) the policy. On the demand side, we employed a fixed-effects regression model to assess changes in household sugar consumption, comparing post-policy outcomes to a counterfactual scenario predicted from pre-policy trends (i.e., what purchases would have been expected in the post-policy period, in the absence of NG). On the supply side, we examined changes in the monthly average sugar and saturated fat content per 100 ml of the beverages purchased as well as the prevalence of artificial sweeteners, common replacements for sugar, before and after, hypothesizing that manufacturers reformulated products to avoid NG C and D classifications during the grace period.

Preliminary results show that NG label reduced household sugar consumption from beverages purchases by 3.10g [95% CI: − 4.99, − 1.23], or 17% per household per day, compared to the counterfactual. These findings align with a study on Chile's food labelling policy, which reported a 9.1 kcal per capita per day decrease [CI: –11.5 to –6.6] (13.2% decrease, equivalent to 2.28 grams of sugar reduction) relative to the counterfactual scenario. On the supply side, the average sugar content of beverages purchased decreased by 1.65g [95% CI: −1.658, −1.647], or 29%, while saturated fat content fell by 0.07g [CI: -0.071, -0.066], or 10%. Additionally, the proportion of beverages containing artificial sweeteners increased by 12.3% [CI: 12.22%, 12.37%], suggesting reformulation efforts to maintain consumer appeal.

By addressing gaps in the literature on the real-world and sugar-specific impacts of FOP labels, this study provides robust evidence of NG's dual effectiveness in driving healthier consumer choices and industry product reformulation. These findings have significant implications for policymakers globally in designing interventions to combat NCDs and promote healthier diets.

Ind-35 Do Cash Transfers Narrow Health Disparities? Evidence from Veterans with Disabilities

PRESENTER: **Johnny Huynh**

We study the effect of cash transfers on health disparities using data from the Department of Veteran Affairs' Disability Compensation program, one of the nation's largest cash transfer programs. Our instrumental variables strategy analyzes disability claims and medical records for over 800,000 veterans, leveraging the quasi-random assignment of these claims to two agents: caseworkers and physicians. Cash transfers reduce mortality on average, but there is considerable heterogeneity. Using only the caseworker instrument, we find that receiving $300 per month reduces 5-year mortality by 1.0 pp. Conversely, the physician instrument recovers a significantly smaller effect of 0.4 pp. We reconcile this discrepancy with a reverse selection-on-gains model, in which caseworkers and physicians differentially target cash transfers but sicker veterans gain the least from transfers. Our results help explain disparate findings in the literature and provide policy implications for targeting transfers to narrow disability-related health disparities. # **Long Abstract** People with disabilities generally experience worse health than those without disabilities. Health disparities based on disability reflect structural barriers like poverty, inadequate medical care, and housing precarity (WHO 2022). Governments worldwide implement cash transfers to reduce economic hardship for people with disabilities, but the effectiveness of cash transfers on improving health is mixed, with variations in methodology, settings, and transfer sizes. Additionally, differences across estimates may suggest that the effect of identical transfers varies across individuals within the same population, known as essential heterogeneity (Heckman et al. 2006). However, evidence on the health effects of cash transfers is limited, particularly for people with disabilities. This paper examines the heterogeneous effects of cash transfers for veterans with disabilities, a key group in redistributive policies in the U.S. Veterans, who have access to comprehensive health insurance, provide a useful contrast to populations for whom transfers significantly expand access to medical care. The study focuses on the VA's Disability Compensation program, which supports veterans with service-related disabilities. Using a dataset of over 800,000 veterans, we estimate the causal effect of cash transfers on health outcomes and explore heterogeneity in this relationship. The data allow us to analyze medical conditions, healthcare utilization, and migration to understand the mechanisms driving treatment effects. To isolate the causal effect of cash transfers, we use an instrumental variables (IV) strategy based on the quasi-random assignment of disability claims to caseworkers and physicians. VA policy prohibits veterans from choosing their assessors, and we validate this design by showing that veteran characteristics do not predict assignments. We also show that caseworkers and physicians vary in leniency. Veterans assigned to lenient agents receive about $300 more per month. Our IV strategy finds that receiving $300 per month reduces 5-year mortality by 0.8 percentage points, increases preventive medical care use, reduces reliance on homelessness services, and slightly lowers the incidence of metabolic diseases.

Ind-1940 Estimating the value of CEPI s 100 day mission in terms of public health, economic and educational benefits using the DAEDALUS model

PRESENTER: **Prof. Katharina Hauck, PhD**, Imperial College London
AUTHORS: Rob Johnson, Patrick Doohan, Andy Torkelson, Peter Windus, Dimitrios Gouglas, Alice Sabino

The Coalition for Epidemic Preparedness Innovations set the world the ambitious goal to put investments in place that allow the development and distribution of an effective vaccine within 100 days of a novel SARS-X virus with pandemic potential being sequenced. The health, economic and social benefits of this investment may far exceed its costs but are currently unknown.

The objective of this work is to estimate the societal value of investments that drastically decrease the time-to-market of a strain-specific vaccine (SSV) after identification of a new sarbecovirus (SARS-X) with pandemic potential, and of a broadly protective sarbecovirus vaccine (BPSV) that would be available prior to the the SSV.

Using the integrated epidemiological-economic model DAEDALUS, we simulate thousands of hypothetical SARS-X epidemic trajectories assuming different levels of investments into vaccine development, manufacturing and deployment are made. We summarise epidemic outcomes into three measures of societal welfare, measured in monetary terms: lives lost, economic losses due to business closures, and lost education due to school closures. We calculate outcomes for synthetic countries constructed by sampling from real-world demographic, societal and economic data from low-, middle and high-income countries.

The value of investing into vaccines is heavily influenced by the timing and severity of future SARS-X pandemics, which are highly uncertain. We estimate the likelihood and severity of future pandemics using data on historic pandemics, and present findings for a milder 'once-in-thirty-years' and a more severe 'once-in-one-hundred-years' pandemic.

Without advance vaccine estimates, we project that a milder pandemic would result in a counterfactual total socio-economic loss of 12.3--24.4% of global GDP and deaths of 0.9--1.6 per thousand population (all findings in interquartile ranges). A more severe pandemic is projected to result in a loss of 84.9-214.6% of GDP and deaths of 5-12.3 per thousand population. Annualised, a pandemic has a loss of 0.47-0.86% of global GDP, and deaths of 0.03-0.05 per thousand population.

An optimistic advance investment scenario reduces time to availability of a SSV to 100 days and increases the speed of vaccine administration due to investments into a 9-billion-dose reserved vaccine manufacturing capacity and a billion-dose BPSV stockpile that can be administered immediately to individuals aged 65 and over. We estimate the value of maximum advance investments to be 0.08-0.15% of global GDP per year. For a milder pandemic, the benefit would be about 3.4-6.7% of global GDP, equivalent to $3.6–7 trillion for the 2023 global GDP of $105 trillion. For a more severe pandemic, we estimate the value of maximum advance investments to be 21.4--44.2% of global GDP, or $22.5–46.4

trillion given 2023 global GDP. We consider additional scenarios to estimate the value of lower-value investments and to disentangle the contributions of the SSV and the BPSV.

Our study has many limitations but can still provide decision makers with some indicative evidence on the broader societal value of advance investments into vaccines that can protect countries around the world against a possibly devastating future SARS-X pandemic.

Ind-1764 The Social Cost of Efficiency-Seeking Plans in OECD Health Systems

PRESENTER: **Simon Combes**

AUTHORS: Bruno Ventelou, Marwan-al-Qays Bousmah, Mohammad Abu-Zaineh

Abstract

Background: Has the quest for efficiency in OECD health systems impacted the social gradient of health? We examined the cross-dynamics of the health system equity-efficiency nexus among OECD countries in the past two decades.

Methods: We used a three-step methodology based on annual macro-level data from 36 OECD countries for the period 2004-2021. First, we estimated the performance of health systems using a stochastic frontier analysis. We then assessed the equity of health systems using simple measures of income-related inequality in self-assessed health. Lastly, we estimated the dynamic relationship between health system efficiency and equity using a panel Granger causality analysis. We also stratified the analysis by type of health system: *viz*. publicly- vs. privately-dominated health service provision.

Findings: We find evidence for a bidirectional causality between health system efficiency and equity. An increase in health system efficiency leads to increasing socioeconomic inequalities in health, yet only in countries with predominantly private health service provision. Interestingly, decreases in socio-economic inequalities in health always lead to higher health system efficiency.

Interpretation: The pursuit of efficiency gains in OECD health systems has not been a precondition for socioeconomic equity in health. Adverse effects of efficiency-seeking interventions on health equity are apparent in the private provision of healthcare. However, addressing health inequalities provides a plausible route to enhance efficiency, regardless of the type of health system.

Funding: This research is part of the UNISSAHEL program, funded by the Agence Française de Développement (AFD).

Keywords: Equity-efficiency tradeoff; Health system; Stochastic frontier analysis; Granger causality; Reverse causality.

Ind-2781 Real-World Insights on Full Vaccination Effectiveness Against Covid-19: Evidence from an Instrumental Variable Approach

PRESENTER: **Mohamad Baihaqi Mohamad Basri**

Background: The Covid-19 pandemic has posed significant global challenges, with vaccination identified as a critical strategy to curb its spread. While prior studies have explored vaccination impacts at national or regional levels, little is known about localised effects, particularly in Malaysia. This study addressed the research gap by analysing the relationship between full vaccination coverage and Covid-19 case rates across 158 districts in Malaysia. It also investigated the influence of sociodemographic and economic factors such as population density and income levels on pandemic dynamics. **Aim:** The research aimed to determine the causal effect of full vaccination on Covid-19 cases at the district level. It sought to answer: *Does full vaccination coverage significantly reduce Covid-19 cases, and how do sociodemographic and economic variables interact with vaccination rates to influence case numbers?* **Methodology:** This study employed an instrumental variable (IV) approach to address endogeneity and potential reverse causality. The number of vaccination centres per district served as the instrument for full vaccination rates, assuming vaccination centres predict vaccination rates but were not directly related to case numbers. Cross-sectional data were used and sourced from the Ministry of Health and the Department of Statistics Malaysia. Variables analysed include Covid-19 case rates, full and partial vaccination rates, population density, percentage of elderly individuals, marital status, median household income and the number of schools per district. The analysis employed log-linear regression to normalise the data, which showed skewed distributions in case and vaccination rates. First-stage regressions validated the instrument's predictive power for full vaccination rates ($p < 0.01$). The second-stage regressions estimated the causal effect of full vaccination on case rates while controlling for confounders like population density and socioeconomic factors. Robustness checks were performed to confirm the validity of the instrument and ensure consistency in results. **Results:** Fully vaccinated populations were shown to significantly reduce Covid-19 case rates. IV estimates indicated that a 1% increase in full vaccination per 1,000 individuals reduced the Covid-19 cases by 2.6% to 12.1%. Partial vaccination, however, was positively associated with case rates, increasing cases by 11.2% to 12.6%, suggesting insufficient protection against highly virulent variants like Delta. Population density was a significant factor, with a 22% higher case rate observed in densely populated districts for every one-unit increase in log population density. Median household income negatively correlates with case rates, where a 1% increase in median income results in a 0.57% to 0.61% reduction in cases. Socioeconomic disparities, such as education level, also played a role, with districts having higher numbers of schools experiencing fewer cases, though this result was not statistically significant. **Conclusion:** The study highlighted the effectiveness of full vaccination in significantly reducing Covid-19 cases, emphasising its importance in densely populated and low-income areas. Policymakers should prioritise equitable vaccine distribution and remove barriers to uptake in vulnerable populations. Additionally, addressing disparities in population density and socioeconomic status was critical for managing pandemics effectively and mitigating their impact on public health.

Bali International Convention Centre – Dahlia

Impacts of and Impacts on the Health Workforce

MODERATOR: **Daniel Avdic**,

Ind-121 Primum Non Nocere? Mortality Effects of a Physician Strike in Germany

PRESENTER: **Daniel Avdic**

AUTHORS: Lea Nassal, Martin Karlsson, Nina Schwarz

We study the consequences of a protracted physician strike in German university hospitals in 2006 on patient mortality. We compare striking and non-striking hospitals in a causal difference-in-differences design using a comprehensive dataset of all hospital admissions in Germany linked to digitised records of strike participation. Our results indicate that the strike led to a sharp decrease in hospital admissions and a significant increase in hospital mortality in striking hospitals. Applying a doubly robust LASSO algorithm to adjust for care rationing patient selection, we show that around half of the mortality effect of the strike can be attributed to quality-of-care factors. Finally, we find spillover effects on admissions to nearby non-striking hospitals but no corresponding impact on hospital mortality. We conclude that prolonged industrial action in the healthcare sector may have severe consequences for patient safety unless appropriate risk mitigation protocols are established.

Ind-1393 Efficiency Potentials of Digital Practice-Patient Communication for Outpatient Medical Practices: Results of a Mixed Methods Systematic Review

PRESENTER: **Michael Burkard**

AUTHORS: David Weber, Martin Emmert

Background: The shortage of skilled workers and demographic changes among both patients and healthcare professionals are leading to an increasing workload in outpatient medical practices. These trends are contributing to healthcare professionals burning out and the quality of outpatient medical care being at risk. Medical practice staff craves support, especially with communication-related processes. Digital solutions for practice-patient communication (PPC) have the potential to relieve the practice staff and maintain or even optimize medical quality. As the body of knowledge on digital PPC solutions is growing in terms of their impact on medical quality, research lacks knowledge on their efficiency in outpatient medical care.

Objective: This study aimed to identify and evaluate digital PPC solutions' efficiency potential for outpatient medical practices.

Method: This mixed methods systematic literature review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The literature search was conducted within PubMed and The Cochrane Library and included international studies that assessed digital PPC solutions' impacts on medical practice efficiency. Peer-reviewed full texts written in English and published between January 2019 and June 2024 were selected. Data were narratively summarized, categorized in time, staff, material, and cost efficiency, and evaluated regarding their impact. For synthesis of the quantitative and qualitative data, a convergent integrated approach was applied based on the JBI Manual for Evidence Synthesis. Bias assessment was performed using the AXIS (quantitative studies) and CASP (qualitative studies) checklists.

Results: The systematic screening comprised 4,237 articles. Finally, 22 studies (15 quantitative, 7 qualitative) were identified, including 2,670 physicians, 21 non-physician staff, and 301,534 patient appointments. The identified studies assessed efficiency potentials for the following PPC solutions: video consultation (10 studies), video or telephone consultation (not further specified; 8), online messaging (3), SMS (2), patient portal (1), online scheduling (1), and remote patient monitoring (1). Time was the dominant efficiency category with preparation time (15 categorizations) and process duration (17). Interestingly, staff (3) and material (1) were rarely directly mentioned and cost not at all. Summarized, video consultation was rated positively or equally (81%) and online messaging negatively (75%) compared to the standard of communication, whereas SMS, patient portal, online scheduling, and remote patient monitoring were exclusively rated positively or equally. When preparation time was mentioned, most studies (70%) reported positive impacts for all PPC solutions. In terms of process duration, however, the results were indifferent with a positive trend. Regarding staff, there was a tendency that additional non-physician staff were needed for video consultations.

Conclusions: Except online messaging, all other PPC solutions examined were associated with efficiency improvements or equivalent efficiency outcomes. However, video consultation was also associated with some negative efficiency impacts, which is why a differentiated look at individual PPC solutions is necessary. Since the literature has largely focused on video consultation and time efficiency, further research on other PPC solutions and efficiency categories is required. The results can serve as guidance for policy and practice in the further development and implementation of efficient digital PPC solutions.

Ind-126 Gendered Pathways to General Practice: A Cohort Analysis of Career Intentions Among UK Medical Graduates

PRESENTER: **Catharina Savelkoul**

Background and Aim The United Kingdom faces a critical shortage of General Practitioners (GPs), with the number of GPs per 100,000 population declining from 67 in 2009 to 60 in 2018. Despite policy initiatives to increase GP training numbers, including a 2015 government

pledge to add 5,000 GP positions by 2020, the NHS has instead lost 1,694 full-time fully qualified GPs since 2015. This shortage is exacerbated by increasing GP workload, with consultations surging to approximately 30.5 million per month as of February 2024, and the mean number of patients per GP escalating by 17% since 2015 to 2,260. These trends are further compounded by changing health needs and policies aimed at developing more primary and community-based healthcare. Given the scale of the GP shortage, it is crucial to understand the factors that shape medical graduates' intentions to pursue a career in general practice. This study investigates how gender interacts with academic performance to influence GP career intentions among UK medical graduates. While previous research has consistently shown that women are more likely than men to choose a career in general practice, fewer studies have examined how academic achievement moderates this gender difference. By exploring this interaction, we get a deeper understanding of gender-specific career decision-making patterns, which could inform more targeted interventions to boost GP recruitment and retention. **Methods** We conducted a comprehensive cohort analysis using data from the UK Medical Education Database (UKMED) and the 2018 National Training Survey (NTS). The study population comprised around 14,000 medical graduates in their Foundation Programme year 1 or 2. We employed a multi-stage data linkage process, merging NTS data with UCAS application data. The primary outcome measure was intention to pursue a GP career. We utilised a survey design-adjusted logistic regression model, incorporating sampling weights and stratification by medical school. The model included interaction terms between gender and EPM group to capture differential effects across performance levels. To account for potential confounding factors, we adjusted for socioeconomic background, ethnicity, age at entry to medical school, and medical school. **Results** Female medical students are consistently more likely to express an intention to pursue a career in General Practice (GP) than male students, regardless of academic performance and medical school. As academic performance increases, the likelihood of male medical students intending to pursue GP decreases more sharply compared to female medical students, whose GP intention remains relatively stable across performance levels. **Conclusion and Policy Implications** Our findings reveal a "GP paradox" among top-performing female medical students, who maintain a strong interest in general practice despite the overall negative correlation between academic performance and GP intention. This challenges assumptions in the literature about uniform influences of academic achievement on specialty choice across genders and highlights the importance of considering gender-specific factors in understanding career decision-making processes. There is a need to explore the underlying reasons for this gender difference, including societal expectations and perceptions of GP roles. Such insights could inform targeted interventions to enhance GP recruitment.

Ind-294 The Impact of Scale Expansion of Tertiary Hospitals on the Outflow of County-level Medical Personnel-Take Shaanxi Province as an Example

PRESENTER: **Yaxin Zhao**, Xi'an Jiaotong University

Backgrounds:

Promoting the construction of a county-level medical community is the key direction of healthcare reform in China. However, since the initiation of the new healthcare reform, the expansion of tertiary hospitals has been increasingly rampant. This potentially causes issues such as the loss of healthcare personnel in county areas and uneven distribution of medical resources. However, there is still a lack of scientific empirical support on whether the scale expansion of tertiary hospitals siphon county medical personnel.

Methods:

The data were obtained from the Database of Health Manpower Information in Shaanxi Province, Shaanxi Health Statistics Yearbook, and the Shaanxi Statistical Yearbook. The study selected 342529 medical personnel data of county-level secondary hospitals and 185474 medical personnel data of county-level primary care facilities from 2015 to 2019 as research samples. The study employed Difference-in-Differences models and mediation effect models to examine the impact of the expansion of tertiary hospitals on the outflow of county-level medical personnel and its mechanisms.

Results:

The expansion of the number, number of beds, and number of health technicians in tertiary hospitals increased the probability of medical personnel outflow from county-level secondary hospitals by 24.6% (OR=1.246, 95% *CI*: 1.058-1.478, $P<0.05$), 27.6% (OR=1.246, 95% *CI*: 1.058-1.478, $P<0.05$) and 27.9% (OR=1.246, 95% *CI*: 1.058-1.478, $P<0.05$), respectively. The probability of medical personnel from secondary hospitals flowing to tertiary hospitals increased significantly by 1.410 times, 1.270 times, and 1.367 times, respectively. The expansion of the number and the number of beds in tertiary hospitals had no statistically significant impact on medical personnel from the county-level primary care facilities. When the number of health technicians in tertiary hospitals increased by one unit, the probability of outflow from medical personnel from primary care facilities increased by 19.1% (OR=1.191, 95% *CI*: 1.045-1.357, $P<0.01$). The likelihood of flowing to secondary and tertiary hospitals increased by 1.160 times and 1.682 times, respectively. The siphon effect is not lasting on medical personnel from secondary hospitals, and is lagging on the medical personnel in county-level primary care facilities. The number of outflows from county-level secondary hospitals has a mediating effect between the effects of tertiary hospitals' expansion on the outflow of medical personnel from county-level primary care facilities. The expansion of tertiary hospitals had the most obvious siphon effect on medical technicians under 45 years old and those with junior college or above in areas with scarce medical resources.

Conclusions:

The scale expansion of tertiary hospitals has a different siphon effect on the medical personnel of county-level secondary hospitals and primary care facilities. The siphon effect on the medical personnel of county-level secondary hospitals is obvious but is limited on the personnel in primary care facilities. There is a transmission effect of expansion on the outflow of county-level medical personnel. Policymakers should pay attention to the personnel who are easily attracted by expansion, strengthen government regulatory capabilities, and clarify the functional positioning of tertiary hospitals to promote the development of county-level health talents.

Ind-1206 The Impact of Pandemic on the Quality of Future Physicians: Evidence from China

PRESENTER: **Ming Gu**

AUTHOR: Kate Bundorf

Attracting medical students with strong academic aptitudes is vital for the future quality of healthcare. This study assesses how COVID-19 pandemic, an external shock close to the time of application, affected students' career trajectory by attracting or dissuading them from entering the medical major, thereby impacting the quality of students admitted to medical majors in China. We utilized nationwide admission decisions across provinces to 49,321 bachelor's degree granting programs between 2018 and 2023. The main outcome measure is the lowest Gaokao test rank among the admitted students for each program from their home province. Students' exposure to the pandemic was measured by the daily average of the number of new cases per 100K residents and the daily average of COVID-19-specific mortality rate during the 90-day period before application submission. We find that pandemic intensity in students' home province is positively associated with the rank percentile of students admitted to the medical majors. This effect is more concentrated in less economically developed regions and programs in non-elite universities. The COVID-19 pandemic raised students' interest in medicine as well as other health-related majors. Further analysis reveals that changes in desires for job security likely played a vital role. Given the long-term predictive validity of academic aptitude for physician performance, our results indicate an improvement in the quality of future physician workforce, especially in less economically developed regions.

3:30 PM –5:00 PM TUESDAY [Health Beyond The Health System]

Bali International Convention Centre – Denpasar B

Inter-Generational Health

MODERATOR: **Partha Deb**,

Ind-1446 Does Schooling Reduce Child Maltreatment? Evidence From School Entry Laws in South Australia

PRESENTER: **Adam Akmal Dzulkipli**

AUTHORS: Leonie Segal, Nicole Black, David Johnston

Background and Research Aim:

Child maltreatment victims are at high risk of suffering from adverse outcomes, including poor physical and mental health. Correspondingly, reducing children's exposure to abuse and neglect is a key policy objective. Unfortunately, rigorous evidence on policy interventions in this space remain fairly limited. In this paper, we use school entry laws in South Australia to examine whether entering school earlier in life can reduce children's exposure to maltreatment in the household at ages 4-5.

Methodology:

In South Australia, children born before 1 May are eligible to start school in the calendar year they turn 5 years old, whereas children born on or after 1 May are only eligible to start school the following year. We use this eligibility criteria in a regression discontinuity (RD) design to identify the impact of schooling on children's exposure to maltreatment in the household, by comparing the outcomes of children born just before the 1 May cut-off to children born shortly thereafter. Our analysis uses data from the Impacts of Child Abuse and Neglect (iCAN) study, which linked records from multiple government and semi-government agencies in South Australia (SA) to create a large dataset of the universe of children born in the state from 1986 to 2017.

Preliminary Results:

We find that most children comply with the school entry rules in South Australia. Children born just before the 1 May cut-off are 80.4 percentage points more likely to be enrolled in school in the calendar year of their 5th birthday. Correspondingly, we find that these children are 2.6 percentage points (or 26% relative to the control mean) less likely to be notified to CPS for suspected maltreatment and have 32% fewer CPS notifications in that corresponding year. Using data on reporters, we show that this aggregate effect is predominantly driven by a reduction in notifications from reporters outside the education sector. In comparison, we find a small increase in notifications provided by education professionals (e.g. teachers, early childhood educators, childcare employees). Disaggregating the analysis by maltreatment type suggests that the reduction in overall CPS notifications is mainly driven by a reduction in emotional abuse, instead of physical or sexual abuse. Consistent with this finding, we find no effect on emergency department visits for injuries. Heterogeneity analyses suggest larger reductions in CPS notifications among disadvantaged children and children with past maltreatment exposure. Lastly, we examine whether schooling generates spillover effects on younger siblings who are not themselves enrolled in school and find no evidence of adverse spillovers.

Conclusion:

We find that being in the school environment leads to tangible reductions in underlying exposure to maltreatment. Our findings run counter to a large body of literature which documents mostly negative impacts of starting school at an early age on child outcomes; we find that commencing school earlier may actually be beneficial for children who are at risk of maltreatment. Thus, future work should take this into consideration when discussing the overall welfare implications of delaying children's entry into school (i.e. 'redshirting').

Ind-679 The Role of Early Life Conditions on the Development of Child Adaptive Behaviour

PRESENTER: **Mario Martinez-Jimenez**
AUTHOR: Edith Aguirre

The prevalence of neurodevelopmental disabilities, including autism spectrum disorder and ADHD, has risen significantly in the past decade. This study examines the impact of early-life factors, such as infant health at birth and breastfeeding, on adaptive behaviour development by age three in the United Kingdom. Neurodevelopmental disabilities are often diagnosed using adaptive behaviour scales, which assess communication, physical skills, and social-emotional development. Using data from 4,811 children in the UK Household Longitudinal Study (2011–2023), we analyse the role of infant health at birth, breastfeeding practices and parental and household characteristics. Employing a set of robust empirical methodologies, we find that breastfed children exhibit stronger adaptive behaviour by age three. In contrast, children with poor perinatal health show slower development. These adverse effects are particularly pronounced among boys and children from non-white British maternal backgrounds. Socioeconomic status plays a key role in shaping these developmental outcomes. Our findings underscore the importance of early-life interventions to support cognitive development, especially for vulnerable populations. Addressing disparities in early childhood conditions could help mitigate long-term developmental challenges.

Ind-695 Lockdown Silver Linings: How COVID-19 Improved Parents Drinking Behaviours and Well-Being

PRESENTER: **Martina Repetto**
AUTHORS: Susan Sawyer, Julie Moschion, Ms. Susan Méndez

Background: The COVID-19 pandemic led to unprecedented lockdown measures worldwide, significantly impacting daily life. While research has explored the lockdown's broad effects on health behaviours and mental health, establishing causality remains challenging due to data limitations. Among these studies, parents have received relatively little attention, even though they make up a considerable segment of the population. In Australia, 50% of households had children under 15 in 2021, amounting to roughly 9.7 million people. Parents were particularly affected by lockdowns with the closure of schools and childcare facilities. These suddenly increased caregiving and teaching responsibilities without access to usual support networks, potentially affecting their well-being and health behaviours. **Objectives**: This study investigates the causal effects of COVID-19 lockdowns on parents' well-being and alcohol consumption in Victoria, Australia, addressing the research gap concerning the pandemic's specific effects on parents. **Methods**: We employ a quasi-natural experimental design using data from the Victorian Adolescent Health Cohort Study (VAHCS), which began in 1992 with over 2,000 participants aged 14 and includes 11 waves up to 2020. The exogenous timing of the COVID-19 lockdowns allows us to create treatment and control groups: parents interviewed after the first lockdown are the treatment group, while those interviewed just before serve as the control group. Our empirical strategy follows a difference-in-differences estimation to determine the causal effects of lockdowns. We use detailed measures of alcohol consumption over the past week and comprehensive clinical questionnaires to assess mental health. **Key Results**: Our findings indicate a negative effect of the lockdown on high-risk and binge drinking. Specifically, there is a 5.9 percentage point decrease in the likelihood of consuming five or more standard drinks in a day within the past two weeks and a 5.2 percentage point decrease in the likelihood of being a drinker or binge drinking in the previous weeks. This reduction is driven by fathers, with no significant change observed in mothers' drinking behaviours. There are no significant changes in the average units of alcohol consumed daily or weekly. Using more stringent measures of mental health than past studies and focusing on parents, we find different results. On average, we do not observe any effect of the lockdown on parents' main measures of mental health. When significant changes are observed, they indicate a positive impact: fathers exhibit a 6.5 percentage point decrease in the likelihood of being diagnosed with depression, while mothers report higher satisfaction with the relationships with their partners. **Conclusions**: The lockdown measures appear to have had a positive effect on reducing high-risk and binge drinking behaviours, especially among fathers, likely due to increased time at home and social life restrictions. Additionally, we show decreased probability of depression for fathers and improved relationship satisfaction reported by mothers. The findings suggest that lockdown-induced changes in social environments and routines can have beneficial effects on certain health behaviours and family dynamics, highlighting the complex and sometimes positive impacts of public health measures on different demographic groups.

Ind-985 Examining the Impact of Parental Separation on Children's Physical and Mental Health Outcomes

PRESENTER: **Xiaoxue Dou**
AUTHORS: Bao Nguyen, Luke Brian Connelly, Sabrina Lenzen

Background: The quality of parental relationships can have profound impacts on children's physical and mental health. There are growing concerns that parental separation may have detrimental effects on children's overall well-being and development. Many surveys and various statistical methods have been used to explore the association between parental separation on children's physical and mental health outcomes. However, the causal effects in this area are less documented, with studies so far not addressing endogeneity issues in the relationship.** **Objective/Aim:** We aim to fill the gap by providing robust estimates on the dynamic effects of parental separation on children's health outcomes using a difference-in-differences framework. **Method:** We use data from the Longitudinal Study of Australian Children (LSAC), an ongoing nationally representative study that commenced in 2003. The sample includes children from both urban and rural regions across all Australian states and territories. The study follows two cohorts, "B-cohort" (aged 0-1 years in 2003-04) and "K-cohort" (aged 4-5 years in 2003-04), tracking their development from childhood into adulthood. To estimate the impact of parental separation on children's physical and mental health outcomes, we use a dynamic difference-in-differences (DID) framework, comparing health outcomes of children who experienced parental separation compared to those who do not. Because the timing of family separation among children vary significantly in our data set, we use the estimator proposed by de Chaisemartin & D'Haultfœuille (2024). The estimator is suitable for situations where treatment timing differs and treatment lags may affect the outcome. This approach also accounts for heterogeneity in treatment intensity of trajectories. **Results:** Our analysis reveals that parental separation significantly influences children's mental health. The adverse psychological effects demonstrate the largest effect immediately after parental separation, followed by a gradual regression toward baseline levels. Our findings indicate no statistically significant impact of parental separation on children's physical health outcomes. Stratified analyses

demonstrate gender-specific variations, with girls exhibiting greater psychological vulnerability to parental separation compared to their boys counterparts. Further examination of parental educational attainment reveals that children of parents who did not complete twelve years of education or its equivalent demonstrate the most severe and persistent psychological impacts post-separation. Notably, these children fail to demonstrate the typical trajectory of returning to baseline psychological functioning observed in other groups. **Conclusion:** Our findings have significant implications for policy and practice. The results underscore the necessity for targeted mental health interventions during post-separation periods, particularly for girls and children from families with lower educational attainment.

3:30 PM –5:00 PM TUESDAY [Health Care Financing & Expenditures]

os102 Bali International Convention Centre – Hibiscus

Pushing the Boundaries of Disease Expenditure Tracking

MODERATOR: **Simon Wieser**, Zurich University of Applied Sciences

DISCUSSANT: **Cynthia Chen**, National University of Singapore; **Emily K Johnson**, University of Southern Denmark

abs-os136 Assessing Drivers of Variation in Health Care Spending Across US Counties, 2019

PRESENTER: **Joseph Dieleman**, University of Washington

AUTHORS: Maitreyi Sahu, Max Weil, Sawyer Crosby, John W Scott, Azalea Thomson, Meera Beauchamp, Kayla Taylor, Drew DeJarnatt, Marcia Weaver

Background: While the US as a whole has world leading health spending per capita, there is substantial variation in health care spending across US states and counties. The state of Utah spends close to a third as much per person as the state of Alaska. Furthermore, much of health care spending is driven by even more local factors, such as prices, underlying health, and demand. There is little research assessing variation of health care spending across US states, and even less exploring variation at the county level. Understanding drivers of health care spending across US counties could be valuable for developing policies to lower health care spending and improve outcomes. In this paper we focus on this within-country variation and estimate the contributions spending variation to of (i) population age, (ii) health conditions prevalence, (iii) service utilization, and (iv) service price and intensity to overall health care spending across US counties.

Methods: Data for four key drivers of spending per capita were extracted for 3110 US counties, 148 health conditions, 38 age-sex groups, four payers, and seven types of care for 2019 from the University of Washington's Disease Expenditure Project. Service utilization was measured as service volume per prevalent case, while price and intensity was measured as spending per visit, admission, or prescription. Linear regression and Das Gupta and Shapley decomposition methods were used to estimate the contribution of each factor.

Results: In 2019, 70.3% of cross-county health care spending variation was explained by service utilization, while population age, disease prevalence, and price and intensity of services explained 4.7%, 3.9%, and 21%, respectively. The rate at which these factors contributed to variation in spending varied by payer, type of care, and health condition. Utilization per prevalent case was most associated with insurance coverage, median income, and obesity, while service price and intensity was most associated with median household income. Differences in cross-state spending levels were also attributed to different factors. For Utah, the state with the least health care spending per capita, spending rates were lower for all types of care due to the young age profile. For Alaska, the state with the highest spending, spending rates were relatively high for ambulatory, hospital inpatient, and emergency department care. For all three types of care, high service price and intensity contributed most to the above-average spending. While service utilization was the primary driver of cross-country variation, spending increases over time were driven mostly by increases in price and intensity of care.

Conclusions: Variation in health care spending among US states and counties was largely related to variation in service utilization. Understanding the drivers of spending variation in the US can help policymakers reduce or at least maintain US health care spending in the future.

abs-os184 Estimating Health Spending on Diseases and Injury in Australia

PRESENTER: **Emily Bourke**

AUTHORS: Geoff Callaghan, Nikita Ramachandran

Background: *Health system spending on disease and injury in Australia 2022–23* analyses Australia's national health spending to provide additional detail about the people receiving care and the conditions and diseases being treated. In this analysis, 2022–23 data is presented for each of the 17 Australian Burden of Disease Study (ABDS) groups and 220 conditions within these groups.

Methods: This analysis uses a range of modelling techniques to apportion health spending to population groups based on age and sex, and to ABDS groups and to conditions within those groups. Spending for three additional groups, well care, the treatment of risk factors and examination and observation NEC are also included. Spending estimates are calculated from national datasets of hospital admissions, emergency departments, outpatient clinics, non-hospital primary care and referred medical services, prescription pharmaceuticals, and dental. Diagnostic information is based on the conditions recorded in each episode of care at a hospital, or from survey data for non-hospital services, and costs are distributed across comorbidities. This analysis also includes a time series of data between 2013–14 and 2022–23.

Results: In 2022–23 the highest spending was for cancer ($18.9 billion), followed by cardiovascular diseases ($16.2 billion), and musculoskeletal disorders ($15.9 billion). Cancer also had the highest burden, or human cost of disease in 2023. Second highest in terms of disease burden was mental health conditions and substance use disorders.

Spending on cancer more than doubled from $9.3 billion in 2013–14 to $18.9 billion in 2022–23 and has been the highest ranked disease group in terms of spending since 2014–15 accounting for around 10% of spending each year. Over the period 2013–14 to 2022–23, the largest increase in cancer spending was observed for prostate cancer, non-melanoma skin cancer, breast cancer and bowel cancer.

There was $13.3 billion spent on well care in 2022–23. The majority of this spending (82%) was for routine dental checkups and cleaning and pregnancy and postpartum care.

Conclusion: Whilst findings in this analysis are based on estimates (rather than direct observations) these data provide important insights into the nature and drivers of health spending, such as how an ageing population affects health spending.

abs-os135 Mapping Spending by Disease in Switzerland: Overcoming the Challenge of Limited Diagnostic Data in a Fragmented Health Care System

PRESENTER: **Michael Stucki**, University of Zurich
AUTHORS: Stefan Scholz, Lukas Kauer, Maria Trottmann, Mr. Simon Wieser

Background

Studies from a broad range of countries have demonstrated the usefulness of disease-specific spending estimates in assessing key health economic questions, such as identifying spending drivers and assessing overall healthcare productivity. However, in Switzerland's fragmented healthcare system, limited data on diagnoses complicates these efforts. This study breaks down total healthcare spending over a 10-year period from multiple perspectives, providing new insights into health care spending and its drivers.

Methods

We decompose total healthcare spending according to Swiss National Health Accounts (NHA) in 2012, 2017 and 2022 by 65 diseases from 20 aggregated disease groups, 19 health services, 6 payer categories, 20 age groups, and patient sex. Given the absence of a nation-wide registry of healthcare service use across services and payers, we combine a multitude of existing data sources to assign spending to diseases. These sources include a hospital inpatient registry, long-term care patient assessments, claims data from health and accident insurance, and drug sales data. In outpatient care, we identify diseases at the individual level based on diagnostic clues in claims data, such as disease-specific medication. The resulting spending estimates are scaled to align with total NHA spending.

Results

Per capita health care spending in Switzerland increased from 8'329 Swiss francs (CHF) in 2012 to 10'423 CHF in 2022 (+25.1%). Total healthcare spending increased by 37.4% over the same period. The most expensive aggregated disease group in all years were *musculoskeletal disorders*, accounting for 11.5% of total spending in 2012 and 2017 and 11.1% in 2022. They were closely followed by *mental and substance use disorders* (10.7%; 10.3%; 10.2%), and *neurological disorders* (10.4%; 10.4%; 9.7%). The single most expensive disease was *Alzheimer's and other dementia* (4.8 bn CHF in 2022; 5.2% of total spending). The largest increase in spending between 2012 and 2022 was observed for *skin and subcutaneous diseases* (+74.1%), *endocrine diseases* (+64.4%), and *neoplasms* (+47.6%). The increase was only modest for *oral disorders* (+5.4%). The spending increase was mostly driven by a substantial increase in outpatient spending, for instance accounting for 62.4% of the total spending increase in *musculoskeletal disorders*. For few disease groups, spending for medication was the most important driver, for example *digestive diseases* (54.5% of the total increase), *endocrine diseases* (66.2%), and *neoplasms* (38.0%). *Neurological disorders* dominated spending in the elderly, largely due to the high spending in long-term care.

Conclusions

Healthcare spending in Switzerland has increased substantially over recent decades. By breaking down total spending by disease, service type, payer, and patient characteristics, we build a framework to better understand the structure of healthcare spending and the drivers behind its increase. Despite the lack of diagnostic coding in many areas of the Swiss healthcare system, we successfully estimated spending across multiple perspectives over a 10-year period. Our findings provide essential inputs for more in-depth analyses of spending drivers and assessments of healthcare system productivity.

3:30 PM –5:00 PM TUESDAY [Health, Its Valuation, Distribution And Economic Consequences]

os174 Bali International Convention Centre – Jakarta A

Advancing the Measurement and Valuation of Child Health

MODERATOR: **Lazaros Andronis**, University of Warwick

CONVENER: **Christine Mpundu-Kaambwa**, University of Melbourne

abs-os416 Do Adults and Adolescents Value EQ-5D-Y-5L Differently: A Quantitative Exploration Using DCETTO

PRESENTER: **Yiting Luo**
AUTHORS: Richard Norman, Brendan Mulhern, Deborah Street, Rosalie Viney

Objectives

An important hurdle for the development of value sets for paediatric preference-based measures such as EQ-5D-Y-5L is the largely unaddressed normative and methodological questions regarding whose preferences (adult or youth preferences) and which perspectives (self-perspective or a 10-year-old child's perspective) should be used. This study investigates similarities and differences in the valuation of EQ-5D-Y-5L health states by adult and adolescent samples and explores whether different value sets are required. This is the first study to systematically compare the impact of perspectives on preferences in adult and adolescent populations using DCE with duration (DCETTO). This work aimed to inform the development of Australian value set(s) for the EQ-5D-Y-5L.

Methods

Overall, 250 DCETTO choice sets were designed. In both samples, each respondent was presented with 20 choice sets with only one perspective. An online survey was administered to a representative sample, with respect to age, gender and region, of the Australian adult population and to a representative sample of the Australian paediatric population aged between 12-17 years old. Conditional logit models were used to estimate utility weights for the DCETTO and estimates were compared across perspectives and samples. Relative attribute importance (RAI) was estimated using the Delta method. Indicative value sets were calculated based on the DCETTO estimates. Heterogeneity was explored using latent class analysis (LCA).

Results

Overall, 2020 adults and 2151 adolescents aged between 12-17 were recruited and fully completed the survey. A number of key differences in model parameters, and therefore value sets, between the adult and adolescent samples were identified. This included significant differences in preferences for self-care. Exploration of RAI suggested for both of the perspectives, adults weighted pain/discomfort (PD) and mobility (MO) significantly differently where PD was the most important and MO was the least important while PD was the most important and SC was the least important in the youth sample for both of perspectives. Youth values from a 10-year-old perspective provided 8.4% worse-than-dead (WTD) health states and the worst health state (55555 in EQ-5D-Y-5L) valued at -0.417, a higher valuation than those from youth self-perspective or adult values with either perspective, which yielded more than 14% of WTD health states and worst health state all valued at below-0.513.

Conclusion

This study is one of the first EQ-5D-Y-5L valuation studies in both adult and adolescent samples. The evidence supports the hypothesis that adults and adolescents have different values for EQ-5D-Y-5L, influenced by the perspectives used, and the differences are more significant in certain dimensions which might drive the variation in values estimated. The results will inform the development of EQ-5D-Y-5L national value sets in Australia by informing the normative decision that needs to be made regarding which samples and perspectives to use.

abs-os426 Improving Health-Related Quality of Life Measurement for Children: Adapting the CHU9D with Visuals and Audio

PRESENTER: **Christine Mpundu-Kaambwa**
AUTHORS: Katherine Stevens, Julie Ratcliffe, Philip Powell, Donna Rowen

Background Children may find self-reporting health-related quality of life (HRQoL) using patient-reported outcome measures presented in text-based formats difficult, particularly younger children and those with developmental delays or chronic illnesses. Given the importance of inclusivity in health assessments, there is a need to explore alternative communication methods, such as visuals and audio. The Child Health Utility 9 Dimension (CHU9D) instrument, a generic utility-based paediatric HRQoL tool for children aged 7-17, currently exists only in text form. The aim of this study was to assess the feasibility of adapting the CHU9D with pictorial and audio elements to enable self-completion by children who face challenges with traditional text formats.

Methods The study followed a four-stage process. First, a systematic review was conducted to examine existing pictorial and audio-based HRQoL assessments. In Stage 2, a collaborative codesign approach was used to develop child-friendly pictorial representations for the dimensions "Worried," "Sleep," and "Daily Routine," with input from a graphic designer and clinicians, focusing on image complexity, colour, and visual appeal. Stage 3 involved the creation of pictorial response scales to complement the CHU9D's existing 5-point text response scale, along with audio recordings (using both male and female voices) for each question. Lastly, Stage 4 included semi-structured pilot interviews with children with long-term health conditions and disabilities. These interviews assessed the acceptability and comprehension of the adapted instrument.

Results The semi-structured interviews were conducted with 14 children (6 boys and 8 girls) aged 7-14 years. The children had a range of health conditions, including speech delay, autism spectrum disorder, attention-deficit/hyperactivity disorder, and physical disabilities. Among these participants, 79% understood the questions without requiring additional clarification, and 86% found the pictorial representations accurately depicted the intended emotions or states. Feedback indicated strong acceptance of the adapted instrument, with children appreciating the colourful, engaging characters. Positive responses highlighted that the audio voiceovers improved comprehension, with children expressing preferences for both visual and audio options.

Conclusion The study demonstrates that pictorial and audio adaptations of the CHU9D instrument may improve inclusivity and comprehension for children with diverse capabilities. The positive reception of the codesigned instrument suggests potential for wider use in paediatric HRQoL assessments.

abs-os508 Mapping From EQ-5D-Y-5L to EQ-5D-Y-3L: Exploration of Methods

PRESENTER: **Mina Bahrampour**
AUTHORS: Tianxin Pan, Juan Manuel Ramos-Goni, Mark Oppe, Aureliano Finch, Brendan Mulhern, Nancy Devlin, Yan Feng

Abstract

Background:

When specific utility values for health-related quality of life (HRQoL) instruments are not available, mapping algorithms, or 'crosswalks,' are often used in economic evaluations. EuroQol has developed two youth specific measures the EQ-5D-Y-3L and the EQ-5D-Y-5L. While direct estimation of preferences to establish a value set for the EQ-5D-Y-5L is still unpublished, value sets for the EQ-5D-Y-3L already exist. By applying mapping algorithms, existing Y-3L value sets can be used while preference studies for the Y-5L are still underway. This study aims to explore the different response mapping methods to map Y-5L responses to Y-3L responses.

Methods:

Various methods were explored using data from the Paediatric Multi-Instrument Comparison Study (P-MIC) within the QUOKKA project Australia. Several response mapping models, including ordered logistic regression (OLR) and multinomial logit (MNL), and nonparametric model, were employed as mapping approaches. Models were fitted with and without a latent factor to count for correlation between observations that come from the same respondent. The primary criterion for model selection was prediction accuracy (using statistical methods such as mean absolute error and mean squared error). Information criteria (AIC and BIC) were also used as predictors for selecting the best-fitting model.

Results:

The sample comprises data pooled from both baseline and follow-up questionnaires collected by PMIC. The total combined sample size was 8,920, consisting of 5,578 self-reports and 3,342 proxy-reports. Analysis indicated that the MNL without a latent factor proved a better fit among the tested methods. The method using a coefficient for self and proxy data demonstrated a better fit.

Conclusion:

Our mapping algorithms facilitates the estimation of health utilities in childhood when EQ-5D-Y-5L data is unavailable. The results of this study have been reported using Australian data set. The performance of these algorithms in childhood populations of other countries and severe condition groups, is yet to be evaluated. The statistical analysis plan and code developed from this study will inform the development of the international Y-3L Y-5L mapping algorithms.

abs-os377 Valuation of the EQ-5D-Y-5L Using Discrete Choice Experiment Methods That Account for Nonlinear Time Preferences

PRESENTER: **Brendan Mulhern**, University of Technology Sydney
AUTHORS: Bram Roudijk, Peiwen Jiang, Rosalie Viney, Nancy Devlin, Alice Yu, Deborah Street

Background

In the development of EQ-5D-5L value sets for use in cost utility analysis, Discrete Choice Experiment (DCE) methods that can account for non-linear time preferences (i.e. assume discounting of duration) are becoming more widely used, and there is emerging evidence that nonlinear time preferences do occur. However, this DCE approach is has yet to be tested for the valuation of paediatric preference based measures such as the newly approved EQ-5D-Y-5L. The aims of this study were to test the feasibility of using DCE methods which account for nonlinear time preferences in the valuation of the EQ-5D-Y-5L, and to explore the impact of valuation perspective (valuing from the self perspective, or the perspective of a 10 year old child) and parent status on the value sets produced.

Methods

A representative Australian adult general population sample completed an online survey which included the completion 15 two stage triplet choice sets. Stage 1 presents health states A and B described by EQ-5D-Y-5L for a fixed duration, and Stage 2 presents health state B and health state C which is full health for a shorter duration. Depending on arm assignment, respondents were asked to take the self or 10 year old child perspective when completing the choice sets. A Bayesian efficient design was used to construct the DCE design. This was done using a series of four design updates based on priors produced using sample sizes of 200 and resulted in a design with 600 choice sets for each perspective. Data were analysed using correlated mixed logit models.

Results

There were 955 and 947 respondents in the self and 10-year-old perspective arms, respectively. In both arms, significant nonlinear time preferences were detected in the ‘self’ (self discount rate was 17%, and ’10-year-old’ discount rate was 15%). Respondents exhibited higher

utility decrements (resulting in a utility value set with a wider range and more states valued negatively as 'worse than dead' (WTD) when valuing from a 10 year old child perspective. This resulted in value sets ranging from 1(for the best health states EQ-5D-Y-5L describes) to -1.42 (for the worst health state), with 42% WTD for the 10 year old arm, and ranging from 1 to -1.1 (26% WTD) for the self perspective. Across all arms, Pain and Discomfort had the largest overall decrement (a proxy for severity). Sensitivity analysis also revealed that being a parent or not influenced values for the self-perspective (but not the 10 year old), with parents producing value sets with a smaller range.

Conclusions

This is the first study to use a nonlinear DCE approach in the valuation of the EQ-5D-Y-5L, and in paediatric HRQoL more generally. Respondents discount future years when valuing states both for themselves and a 10-year-old. There is some evidence that DCE approaches accounting for nonlinear tine preferences are feasible for the valuation of the EQ-5D-Y-5L. However the value set ranges are wider than those produced for adults instruments using similar approaches, and the validity of this requires further investigation.

3:30 PM –5:00 PM TUESDAY [Health, Its Valuation, Distribution And Economic Consequences]

os182 Bali International Convention Centre – Jakarta B

Climate Change and Health Outcomes: Economic Evidence

MODERATORS: **Giulia Greco**, London School of Hygiene and Tropical Medicine; **Chris Sampson**, Office of Health Economics

CONVENER: **Olimpia Lamberti**, London School of Hygiene and Tropical Medicine

abs-os499 Economic Burden of High Temperature on Health Systems in Brazil

PRESENTER: **Huiqi Chen**

AUTHORS: Dorothea Nitsch, Josephine Borghi, Letícia Xander, Kai Wan, Shakoor Hajat, Everton Nunes da Silva, Ivan Augusto Cecilio e Silva, Zhifu Mi, Anna Foss

Background: Climate change poses a significant threat to global health, with high temperatures being among the most direct influencing factors. Current research often focuses on specific health outcomes over relatively short time spans, with limited insight into the broader economic burden, particularly within low- and middle-income countries. This gap calls for comprehensive understanding of the medium-term burden of heat on health systems including economic implications. Brazil, with its multitude of different climate zones and socio-economic disparities, provides a suitably diverse setting to explore how heat affects health systems, and the effectiveness of adaptation strategies. Therefore, this study aims to assess the impact of heat on Brazil's health system, across all causes leading to hospitalisation, in both the current and future time-periods, and projects how adaptation and mitigation efforts may alter these impacts over time and across subnational regions.

Methods: Daily non-elective hospital admissions were collected from the Brazil Hospital Information System for 5,459 municipalities, representing 98% of all Brazilian municipalities, spanning 2008 to 2019. Gridded daily maximum temperature data were obtained from European Centre for Medium-Range Weather Forecasts Reanalysis V5 (ERA5) for the historical period (2008-2023) and projected up to 2060 using six CMIP6 GCM models under three SSP emission scenarios (SSP1-2.6, SSP2-4.5, and SSP5-8.5). We used a case time-series design and distributed lag non-linear models to examine the relationship between high temperatures and the risk of hospitalisation for each state in Brazil. Then, we assessed the attributable hospitalisation burden to high temperatures from 2008 to 2060. Related economic costs were estimated using a "cost-of-illness" (COI) approach that included direct medical costs (admissions) and indirect costs (loss of production). We also modeled adaptive capacity using hypothetical scenarios with adaptation levels of 5%, 10%, and 30% to explore their effects on future burdens.

Results: High temperatures increase hospitalisation risks across Brazilian municipalities, with varied temperature thresholds by region. In the absence of adaptation, projected hospitalisations related to high temperatures are estimated to reach 134,609, 156,180, and 156,570 in the 2050s under SSP1-2.6, SSP2-4.5, and SSP5-8.5 scenarios, respectively. Corresponding subsequent annual economic costs are projected at $200.9 million, $234.7 million and $235.6 million, respectively, nearly doubling from $128 million in the 2010s. However, adaptation measures, modeled as a 10% reduction in the slope of the exposure-response curve, could reduce economic losses by $22 million in the 2050s, representing a 9.6% decrease compared to non-adaptive scenarios. Direct costs account for 79% of the total burden, with the South region disproportionately affected, bearing 22% of national costs while housing only 14% of the population. High temperature-related hospitalisation costs accounted for 0.007% of the GDP and 0.152% of domestic general government health expenditure in the 2010s.

Conclusion: This analysis highlights the substantial economic loss from high temperatures under climate and demographic change, with adaptation strategies showing strong potential to reduce these burdens. The results provide critical insights into the economic implications of heat, highlighting the need for regional adaptation and targeted healthcare investments to manage and mitigate rising health burdens.

abs-os418 From Risk Perception to Resilience: How Health and Social Factors Shape Support for Climate Adaptation

PRESENTER: **Glory Apantaku**

AUTHORS: Terre Satterfield, Mr. Mark Harrison

Background: Sustaining population health in a changing climate is critical and requires public support for adaptation initiatives. Understanding the demographic and perceptual factors driving support for climate adaptation policies is essential for creating effective, equitable, and sustainable strategies. This can enable policymakers design targeted interventions, foster broad-based support, ensure resource efficiency, and

build resilient communities capable of withstanding the impacts of climate change.

Objective: This study investigates the socio-demographic and perceptual factors driving climate adaptation behavior and preferences for future adaptation initiatives within a Canadian sample.

Methods: We conducted an online survey through a Canada-based online market research company to obtain a representative sample of Canadian adults by province, with oversampling of the three territories (Nunavut, Northwest Territories, Yukon). The survey captured participants' experiences with extreme weather, current adaptation practices, and preferences for future adaptation policies. To assess policy preferences, we used a token allocation exercise, where participants distributed a fixed number of tokens between various climate adaptation interventions to indicate their preferred allocation of resources. Descriptive statistics were used to analyze these responses, summarizing participants' perceptions and prioritization of adaptation interventions. We analyzed factors that predict an individual's engagement in adaptation actions using a logistic regression analysis. Support for future policy preferences was also analyzed using a two-part modeling approach. First, we examined the predictors of allocating tokens to one of three policy areas. In the second stage, conditional on allocating tokens to a policy area, we explored what factors predict the number of tokens allocated.

Results: 2104 respondents completed the survey. The adaptation interventions that had the highest mean number of tokens allocated to them included expanding emergency response personnel, providing heating/cooling grants for low-income households, and investing in local food production. The analysis of perceptual factors and adaptation behavior revealed distinct demographic patterns: women, non-binary individuals, and younger adults report higher concern about the health risks of extreme weather events and took more adaptation actions, especially in response to wildfire smoke and extreme heat. In contrast, men and older adults report greater self-efficacy and community attachment but engage in fewer adaptation behaviors. Higher health risk concern, perceived vulnerability to the health impacts of climate change, community attachment, and prior experience with health impacts of extreme weather events all predict taking adaptation action.

Conclusions: The emergence of concern about the health risk of extreme weather events and broader health vulnerability to climate change as an important predictor of adaptive action suggests framing climate adaptation as essential for health can boost public engagement in climate adaptation. Targeted communication with emphasis on community-specific health impacts may further increase adaptation support, fostering a more resilient and engaged public in the face of ongoing climate challenges.

abs-os484 The Burden of Climate-Related Disease in Children Under Five: Disability-Adjusted Life Years in Kenya and South Africa Across Climate Scenarios

PRESENTER: **Ziyi Lin**
AUTHORS: Olimpia Lamberti, Filiz Karakas, James Milner, Debra Jackson, Ms. Giulia Greco, PhD, Mr. Andrew Briggs

The health burden of heat-related morbidity and mortality among vulnerable populations, such as children under-five years old in Sub-Saharan Africa, remains largely unrecognized. A previous study projected the impact of future climate scenarios on three critical health outcomes for this age group in Kenya and South Africa: all-cause mortality, diarrheal disease incidence, and preterm births. Building on this, our study aims to quantify the burden of climate-related diseases in children under five in Kenya and South Africa under different climate change scenarios using Disability-Adjusted Life Years (DALYs). We used a~~ model-based approach to estimate DALYs for the 2040-2059 period by combining years of life lost (YLL) due to premature mortality and years lived with disability (YLD) from non-fatal outcomes for under-five children in Kenya and South Africa. We considered three climate scenarios: (1) a low-emission pathway, targeting net-zero CO2 emissions by 2050 with 1.5°C warming (SSP119), (2) an intermediate-emission scenario with stable emissions until 2050, resulting in 2.5-3°C warming (SSP245) , and (3) a high-emission pathway leading to a 4-5°C temperature rise by the end of the century (SSP585). YLLs were attributed to fatal cases of diarrheal disease, preterm birth complications, and other causes of under-five mortality. For each death, We calculated YLLs based on age, sex, and country-specific life expectancies. YLDs were calculated using modelling strategies, disutility weights and duration data from the Global Burden of Disease (GBD) 2019 study. Diarrheal diseases were categorised by severity (mild, moderate, severe) with corresponding disability weights and durations. Preterm birth complications were stratified by gestational age as extremely preterm (<28 weeks), very preterm (28 to <32 weeks), and moderate-to-late preterm birth (32 to <37 weeks). For each stratum, cases were further categorised by severity of symptoms (asymptomatic, mild, moderate/severe), with proportions estimated using a regression model that incorporated the Healthcare Access and Quality Index (HAQI) for each country. Lifetime durations were assumed for preterm birth complications, though without affecting life expectancy. The value of a healthy year at any age was assumed to be constant. An annual discount rate of 3% was applied to reflect the time value of health benefits. Preliminary findings show that in the high-emission scenario (SSP585), the discounted DALY estimate in 2040-2059 associated with diarrheal diseases, preterm birth complications, and any other under-five cause mortality in Kenya are 34,261 (YLL 31,598, YLD 2,678), 148,168 (YLL 106,879, YLD 41,303), and 38,073 (YLL 38,073, YLD 0), respectively. In the low-emission scenario (SSP119), the total discounted DALY dropped to 120,807, with a 39% DALY decrease for diarrheal diseases and a 45% decrease for preterm births. Complete analysis will be completed by January 2025 and results for Kenya, and South Africa will be presented. Our analysis highlights the substantial health burden on children under-five in Kenya and South Africa if future rising temperature are not effectively controlled, highlighting the urgent need for climate action to protect vulnerable populations

abs-os407 The Economic Burden of Extreme Heat on Pregnant and Postnatal Women in Zimbabwe and South Africa

PRESENTER: **Olimpia Lamberti**, London School of Hygiene and Tropical Medicine
AUTHORS: Shobna Sawry, Chuansi Gao, Celeste Madondo, Clara Heil, Jean La Roux, Tapiwa Nyakabau, Nasser Fardousi, Veronique Filippi, Stanley Luchters, Debra Jackson, Ms. Giulia Greco, PhD

The frequency and intensity of extreme temperatures have increased over the past four decades and are projected to continue rising. Pregnant and postnatal women are particularly vulnerable to adverse health outcomes from heat exposure, which can lead to increased healthcare

expenditures, income and productivity losses, as well as substantial economic burden on households. This is expected to be particularly severe for women living in low-and middle- income countries, however, this remains largely under-researched. This study aims to evaluate the economic burden of extreme heat on pregnant and post-natal women in Zimbabwe and South Africa, evaluating the differences by socio-economic status and assessing the impacts on women's wellbeing and quality of life. We hypothesise that the economic burden of extreme heat is higher among pregnant and postnatal women with lower-socio-economic status, and that women with a higher economic burden have lower levels of wellbeing and quality of life.

This study is part of the HIGH Horizons project, which investigates the economic and health impacts of heat exposure on maternal, newborn, and child health in South Africa and Zimbabwe. As part of the project, semi-structured questionnaires are administered to 100 pregnant women, 50 mothers with a live-birth in the past three months, and 50 mothers with children aged six to nine months, with assessments conducted at baseline, two-months and six-months follow-ups. Participants are recruited from communities in Gauteng Province, South Africa, and Mount Darwin district, Zimbabwe. Questionnaires asked participants about their demographics, household asset holdings, healthcare-seeking behaviours, costs associated with seeking care, out-of-pocket healthcare expenditures, lost income and productivity due to heat-related sickness, and collected data on women's quality of life and wellbeing and quality of life, all within the last month. Baseline data collection will end in January 2025 and data analysis will be completed in March 2025. Analysis will be conducted using Excel and STATA.

We will estimate self-reported direct medical and non-medical costs, productivity and income losses, and financial impacts attributed to heat exposure. The economic burden will be estimated as the sum of household direct medical and non-medical costs, and loss of income and productivity due to extreme heat. We will compare the economic burden across countries and socio-economic status determined using the Demographic and Health Survey (DHS) wealth index based on asset-ownership. We will then use a two-part regression approach to evaluate the association between heat and economic burden, stratified by socio-economic status. A logit model will assess the probability of incurring any costs versus none, while, a generalised linear logistic regression model will estimate expense intensity. The overall effect will be calculated by multiplying the probability of incurring cost by the expected mean costs, stratified by socio-economic status. In addition, we will use linear regression models to examine the association between economic burden and women's quality of life and wellbeing.

Results from this analysis will inform policies to address the financial heat exposure on vulnerable populations. This work provides foundational data to support targeted interventions to minimise heat-related health and economic burden in developing regions.

3:30 PM –5:00 PM TUESDAY [Health, Its Valuation, Distribution And Economic Consequences]

os196 Bali International Convention Centre – Bougainville

Capability Measures for Children and Young People Aged 0 to 15: Development, Validation and Valuation at the Start of the Life-Course.

MODERATOR: **Hareth Al-Janabi**, University of Birmingham

CONVENER: **Isabella Floredin**, University of Bristol

abs-os452 A Qualitative Study to Inform the Development of Capability Wellbeing Measure(s) in Economic Evaluation for Children Aged 0-5.

PRESENTER: **Isabella Floredin**, University of Bristol

AUTHORS: Philip Kinghorn, Katie Breheny, Joanna Coast, Samantha Husbands, Tim J. Peters, Sarah Byford, Paul Anand, Louise Proud, Mr. Paul Mitchell

Introduction: The capability approach offers a broad evaluative framework for funding decision making in health and care interventions, focusing on capability wellbeing outcomes. This framework can be particularly useful for the economic evaluation of interventions for children and young people (CYP), for whom health is only one aspect of their broader wellbeing. The aim of this study was to capture key capabilities for CYP aged 0 to 5 years to inform attribute development for capability wellbeing measure(s) for evaluating health and care interventions for this CYP group. The use of capability measures for CYP in economic decision making could provide a more rounded decision-making process, which captures broader wellbeing outcomes, within the context of limited resources.

Methods: Qualitative in-depth interviews were undertaken in person or online with parents or guardians of CYP aged 0 to 5 years. Purposeful maximum variation sampling aimed to capture the experiences of participants from a range of backgrounds. Initial sampling was through local authority children's centres and private nurseries but due to the COVID-19 social restrictions, participants were thereafter recruited through targeted advertisements on Facebook. Participants were asked to identify aspects of life that are important to their child's wellbeing. Data collection and analysis were undertaken iteratively, with analysis using constant comparison. Analytic accounts were developed to compare similarities and differences in important capabilities between participants and to determine whether different measures are required across CYP age groups. Data collection and analysis is ongoing.

Findings: Twenty-eight in-depth interviews have been undertaken to date with parents or guardians of thirty-two CYP aged 0-5. Three interviews were undertaken pre-COVID-19. Participants are from different areas of England (urban, rural) and from different socio-economic and ethnic backgrounds with CYP of different ages, genders and family backgrounds (one or two parent families). CYP with and without health conditions have been included. Preliminary findings suggest ten key themes important to capability wellbeing across all participants, with some

variation by CYP age: *caring and basic needs; play and enjoyment; leaning and development; communication; exploring and developing a sense of self; feeling loved; emotional security; making own choices; health; safety and protection.*

Discussion:

The qualitative work is generating important capabilities to inform the attributes of

capability measure(s) for CYP aged 0-5. Full findings from the interviews will be presented at the conference. Given that CYP aged 0 to 5 are a heterogeneous group with differing needs at different and fast evolving stages of early development, potential differences identified in important capabilities across the different ages will also be discussed. The number of measures required for this group will be driven by the data analysis. Findings may help provide an alternative approach to measuring outcomes for CYP for economic evaluation of health and care interventions which can better capture the broader outcomes of wellbeing.

abs-os488 An Assessment of the Feasibility of Completion and Construct Validity of the ICECAP Capability Measure for Children Ages 6 to 11 in the United Kingdom

PRESENTER: **Joanna Coast**, University of Bristol
AUTHORS: Tim J. Peters, Samantha Husbands, Philip Kinghorn, Sarah Byford, Mr. Paul Mitchell, Katie Breheny, Simon Leggett, Paul Anand, Isabella Floredin

Introduction: A capability wellbeing measure for children and young people (CYP) aged 6 to 11 (ICECAP-CYP:6-11) has been developed for use in economic evaluation of health and care interventions in the United Kingdom (UK). The ICECAP-CYP:6-11 measure comprises seven capability wellbeing attributes: *Fun and play; Learning and Experiencing; Attachment, stability and support; Physical protection and security; Achievement; Freedom and having choices; Well-becoming/ aspiration.* To enable the use of ICECAP-CYP:6-11 in economic evaluation, the psychometric properties of the measure need to be assessed. This paper explores the feasibility of completion and construct validity of the measure's descriptive system in a general CYP population sample; a key step in establishing the appropriateness of the measure for its specified population.

Methods: To assess feasibility and validity of the ICECAP-CYP:6-11 measure when completed by CYP themselves, a cross-sectional school-based survey was conducted with CYP aged 7 to 11 in schools across the UK, working with Childwise, a research agency that specialises in CYP. Data were collected using a computer-based survey. The sampling strategy planned to target approximately 25-30 pupils per school in each of the 12 UK regions, providing an estimated sample of 300-600 participants. Feasibility is being assessed in levels of completion amongst participants. Construct validity is being assessed by examining whether the associations between the responses to the attributes of the measure and other background factors (i.e. socio-demographic characteristics; Child Health Utility (CHU-9D) health status measure; the Good Childhood Index (subjective wellbeing)) are in the anticipated directions and of a magnitude in line with reasonable expectations. Associations between the ICECAP-CYP:6-11 descriptive system and the background variables are being investigated using chi-squared tests (for categorical variables) or one-way analysis of variance (for continuous variables), focusing on the direction and magnitude of associations as well as on p-values.

Results:

The survey was completed between May and June 2023 with respondents from 26 schools across the UK. The sample (n=672) has an approximately equal number of children by year of age except age 7 (6%), a 50/50 split of boys and girls, a mix of low (22%), middle (41%) and high (37%) school deprivation areas located in urban (38%), suburban (32%) and rural (30%) areas. The majority of responses across the capability levels of the measure suggest high levels of capability for all ICECAP-CYP:6-11 attributes, with more than half of the respondents choosing the highest or second highest capability levels. The frequency of the 'I do not want to answer' responses for the six ICECAP-CYP:6-11 attributes was low, ranging from 1% to 2% apart from the *Physical protection and security* attribute with a higher percentage of 4%. Feasibility and validation analysis of associations is ongoing.

Discussion:

Full findings from the survey will be presented at the conference. This work will provide early evidence for the feasibility and construct validity of the ICECAP-CYP:6-11 measure and can therefore provide support for its use in funding decision-making for health and care interventions. Valuation work will need to be undertaken to enable the measure's use in economic evaluation.

abs-os512 Exploring Heterogeneity in Valuing the ICECAP-CYP:11-15 Capability Wellbeing Measure Using Best Worst Scaling With Children and Young People in the UK

PRESENTER: **Mr. Paul Mitchell**, University of Bristol
AUTHORS: Philip Kinghorn, Katie Breheny, Louise Proud, Samantha Husbands, Tim J. Peters, Paul Anand, Joanna Coast, Sarah Byford, Isabella Floredin

Background

A new measure of capability wellbeing for children and young people (CYP) aged 11-15 years old has recently been developed. The ICECAP-CYP:11-15 has eight attributes: *Fun and enjoyment, Learning and experiencing, Attachment, Emotional security and support, Achievement, Identity and choice, Physical safety*, and *Aspiration*, with four levels per attribute. For the ICECAP-CYP:11-15 to be used in health and care

economic evaluations, it is important that population values are attached to the attributes and their levels so that decision makers understand their importance relative to one another.

Methods

An online panel company recruited 11-15 year olds via their parents/guardians. A best worst scaling (BWS) case 2 (profile) was used to generate population values for the ICECAP-CYP:11-15. Participants completed the ICECAP-CYP:11-15 measure first to familiarise them with eight attributes, and then 10 BWS tasks. A d-efficient design was chosen using Ngene. Surveys were blocked into four. This allowed a different ordering of attributes and their levels across blocks to address any potential order bias and level balance. Time to complete and monotonicity tests were implemented to control data quality.

To explore heterogeneity in the sample, empirical scale parameter (ESP) provides an individual summation of their best minus worst choices, with higher ESP representing higher market share (or importance) placed on that attribute level. Mean ESP were estimated across all participants. Differences in ESP between ages and gender were analysed. Scale adjusted latent class analysis and econometric modelling of the final value sets will be conducted and presented at the conference.

Results

Data were collected from October–November 2022. For the ESP analysis, 1,155 participants were included, with younger (11-12 year olds) and male participants overrepresented. The ESP was highest for *Attachment* (1.022 - 20%), followed by *Fun and enjoyment* (0.841 – 16%), *Physical safety* (0.800 – 15%), *Emotional security and support* (0.645 – 12%), *Achievement* (0.560, 11%), *Identity and choice* (0.465 -9%), *Learning and experiencing* (0.451 – 9%), and *Aspiration* (0.427 – 8%).

Males and 11-12 year olds found *Fun and Enjoyment* relatively more important, with females valuing *Physical safety* and *Attachment* as relatively more important than males. White ethnicities valued *Fun and enjoyment* and *Physical safety* more relative to other ethnicities, who valued *Learning and experiencing* relatively more. Differences were also observed for other participant characteristics, such as home ownership, home type, household income, number of children in the household, number of adults in the household, parent/guardian marriage/ civil partnership status, disability, and being religious.

Discussion

The unadjusted results suggest *Attachment* is the most valued ICECAP-CYP:11-15 attribute by CYP in that age group in the UK. However, if *Physical safety* and *Emotional security and support* were combined as a single attribute (as is the case for adult ICECAP measures), this would have a greater combined value than all other attributes. The new attributes in ICECAP-CYP compared to the adult measures (i.e. *Aspiration*; *Identity and choice*; *Learning and experiencing*) appear the least valued, although this may not be the case following reweighting the sample to be more representative of the 11-15 year old population in the UK.

3:30 PM –5:00 PM TUESDAY [Health Care Financing & Expenditures]

os197 Bali International Convention Centre – Orchid

New Evidence on the Disaggregation and Decomposition of Financial Risk Protection Outcomes in Middle-Income Countries

MODERATOR: **Jacob Kazungu**, KEMRI Wellcome Trust Research Program

CONVENER: **Jacob Novignon**, Kwame Nkrumah University of Science and Technology

DISCUSSANT: **Ama Pokuaa Fenny**, University of Ghana

abs-os477 The Impact of Ageing to the Rise of Financial Hardship: a Decomposition of Drivers Over two Decades in Mongolia

PRESENTER: **Karen Grépin**, The University of Hong Kong

Background:

Like many Asian countries, Mongolia is rapidly ageing, and like many low and middle-income countries (LMICs), its health system is ill prepared to meet the needs of the elderly. A recent systematic review found households with elderly members are much more likely than other households to incur both catastrophic (CHE) and impoverishing (IHE) health expenditures, likely due to both the higher need for health services and fewer financial resources, as they are more likely to be out of the workforce and inadequately protected from old-age security systems. Mongolia's health system has undergone significant reform and transformation following its transition from a centrally planned to a market-driven economy in the 1990s. Many of these reforms have been designed to address the rising burden of paying for health services on households, however, rates of catastrophic (CHE) and impoverishing health expenditures (IHEs) have risen sharply in the last decade. However, little research has explored how demographic shifts may have contributed to rising rates of financial hardship in Mongolia or other LMICs.

Methods:

Using nationally representative household survey data (2002-2023) from the Mongolian Household Socio-Economic Survey (HSES), we are decomposing changes in due to changes in demographic structure of households. Specifically, we used a new typology of households developed by WHO to characterise households by type, including whether or not they have elderly members over the age of 65. At the household level, we used the Oaxaca-Blinder method to decompose changes in out-of-pocket health spending, CHE, and IHEs among households with and without elderly household members to determine the determinants of changes in financial protection among elderly vs non-elderly households.

Findings:

Our preliminary analysis of almost 200,000 households over twenty years suggests that elderly households are approximately 4 times more likely to face CHE and twice as likely to face IHE than non-elderly households. The use of health services is insufficient to account for most of the changes in financial protection, suggesting that the lack of sufficient financial protection polices is placing financial burden on households.

Conclusions:

Our findings shed light on the drivers of poor financial protection among this vulnerable group in Mongolia and provide insights into the methods to develop policies to target this group to make health systems more responsive to their needs.

abs-os483 Decomposing the Rapid Increase in Catastrophic Health Expenditure in China From 1995 to 2018

PRESENTER: **Bingqing Guo**, The University of Hong Kong
AUTHOR: Karen Grépin

Background: The escalating out-of-pocket healthcare expenditures (OOPEs) and resulting financial hardship in China signal significant challenges in achieving Universal Health Coverage (UHC) goals in China by 2030. This study investigates the determinants of financial protection (FP) outcomes and analyzes the factors driving temporal changes in FP in China from 2011 to 2021.

Methods: Using household-level data from the Chinese Social Survey (N=50,866), this study employed unconditional quantile regression, logistic regression, Recentered Influence Function decomposition, and the non-linear Oaxaca-Blinder decomposition to analyze two continuous outcomes- OOPE per capita and OOPE budget share- and four binary outcomes, including any OOPE, catastrophic health expenditure (CATA), impoverishing health expenditure (IHE), and the new SDG 3.8.2 indicator-financial hardship indicator (FHI). Alongside the mean, this study also considered distributional statistics of OOPE per capita and OOPE budget share at the 30th, 50th, 70th, and 90th quantiles (Q30-Q90).

Results: From 2011 to 2019, OOPE per capita increased significantly (e.g., mean: US$202.96 to US$335.09; Q90: US$442.48 to US$746.49), primarily driven by compositional effects, including rising household income, population aging (only at mean and Q30-Q70), and increased presence of young children aged 0-5 years old. From 2019 to 2021, FP outcomes declined significantly (e.g., OOPE budget share: 13.89% to 10.30% at mean), largely due to structural effects, with many factors becoming insignificant in the 2021 wave. A sharp drop in social health insurance coverage between 2019 and 2021 (e.g., New Rural Cooperative Medical Scheme: 46.57% to 31.90%) also significantly contributed to the decline in FP outcomes (e.g., OOPE per capita: -8.39 to -0.09, $p<0.1$; OOPE budget share: -0.36 to -0.03, $p<0.05$). There was significant heterogeneity in FP determinants across distributional statistics: older adults were only linked with higher OOPE per capita at lower quantiles, but not at the Q90.

Conclusion: These findings highlight the role of demographic and socioeconomic shifts in FP changes before the COVID-19 pandemic and the role of decline in health insurance coverage during the COVID-19 pandemic. The Chinese government should prioritize policies to address population aging, the ineffectiveness of social health insurance design, and the sharp decline in social health insurance coverage following the COVID-19 pandemic.

Ind-1833 The Recent Dynamics of Catastrophic Health Expenditure (Evidence from Indonesia)

PRESENTER: **Asep Nurwanda**
AUTHOR: Anu Rammohan

Introduction

Catastrophic health expenditure (CHE) remains a significant barrier to achieving Universal Health Coverage (UHC), particularly in low- and middle-income countries (LMICs). Through its National Health Insurance program (*Jaminan Kesehatan Nasional*, JKN), Indonesia has expanded financial protection since 2014. While the overall incidence of CHE has declined in recent years, evidence on how these benefits are distributed across vulnerable populations (i.e households with elderly or disabled members) remains limited.

Objectives

This study examines the dynamics of CHE in Indonesia from 2018 to 2023, focusing on vulnerable households. It explores disparities in CHE risks for households with elderly and disabled members and assesses the mediating roles of health-seeking behaviour and premium subsidies in shaping these outcomes.

Data and Methods:

We utilise Indonesia's National Socioeconomic Survey (SUSENAS), a nationally representative dataset, from 2018 to 2023. The survey consists of more than 300.000 households annually. The primary outcome variable is a measure of CHE, where a household is considered to experience CHE if its OOP healthcare spending exceeds 10% of total household expenditure per capita. We also employ alternative CHE definitions, including indicators for OOP health expenditure exceeding 25% of total household expenditure, 40% of household capacity to pay,

and impoverishing health spending. We employ multivariate logistic regression models to assess the association between CHE incidence and household vulnerability, controlling for socioeconomic and demographic factors. Interaction terms are included to evaluate the mediating effects of health-seeking behaviour and premium subsidy receipt.

Result

The incidence of CHE in Indonesia shows a downward trend during the study period, coinciding with the JKN program expansion. However, disparities persist. Households with elderly members face a 1.2–1.5 times higher CHE risk, while households with disabled members face a substantially higher risk (ORs between 1.6–1.8).

Mediating factor analysis reveals nuanced findings. Health-seeking behaviour (HSB) is positively associated with CHE risk (OR ≈ 1.3), reflecting higher utilisation costs. HSB significantly mediates CHE risk for disabled households (Disabled×HSB OR ≈ 0.92–1.15 across thresholds), but has limited protective effects for elderly households. Interaction effects of premium subsidy and vulnerable households suggest protective roles, particularly for elderly households who significantly reduced CHE risk (Elderly×Subsidy OR ≈ 0.65–0.82), while effects for disabled households remain non-significant.

Conclusion:

Overall, Indonesia has made progress in reducing CHE incidence. However, vulnerable households continue to experience inequitable financial burdens. Premium subsidies demonstrate a protective effect for households with elderly members, but do not adequately address the needs of households with disabled members. Policies should strengthen financial protection for vulnerable households through promotive actions to improve healthcare utilisation and reform subsidy instruments to enhance inclusivity under UHC.

3:30 PM –5:00 PM TUESDAY [Economic Evaluation Of Health And Related Care Interventions]

os20 Bali International Convention Centre – Karangasem

Combining Trials and Real World Data to Appropriately Inform Decision Models: Exemplars From LungIMPACT, PRIME, SIGNIFIED and MROC Diagnostic Studies

MODERATOR: **Rachael Hunter**, University College London

CONVENER: **Caroline S Clarke**, University College London

DISCUSSANT: **Manuel Gomes**, University College London

abs-os16 Comparing Biparametric to Multiparametric MRI in Prostate Cancer Diagnosis: Cost-Effectiveness Analysis Alongside Non-Inferiority within-Patient Trial

PRESENTER: **Jing Yi Jessica Weng**

BACKGROUND

International guidelines recommend magnetic resonance imaging (MRI) in men with suspected prostate cancer (PCa). Current UK guidelines recommend multiparametric MRI (mpMRI), comprising three sequences: T2-weighted, diffusion-weighted and dynamic contrast-enhancement (DCE). Prior studies evaluating a biparametric MRI (bpMRI) approach, omitting DCE, suggest a similar clinically significant cancer detection rate. However, a bpMRI strategy could reduce scanning time and be acceptably cost-effective vs. mpMRI.

AIM

The primary health economic objective of this analysis was to calculate incremental cost per quality-adjusted life-year (QALY) gained following bpMRI vs. mpMRI strategy based on patient-level information from PRIME, supplemented with quality-of-life (QoL), survival and resource use information from other sources for extrapolation to lifetime horizon.

METHODS

PRIME is a within-patient diagnostic yield study, therefore, the two groups for comparative economic analysis are delineated using hypothetical scenarios. Men with suspected PCa underwent full mpMRI scans. Radiologists, initially blinded to DCE, reported results from the bpMRI sequences first. DCE was then revealed, and radiologists re-reported using all three (mpMRI) sequences. Men with suspicious lesions on either report or with high prostate-specific antigen density underwent targeted (TB) or systematic biopsies (SB). Hypothetical bpMRI- and mpMRI-led treatment decisions were made separately with final treatment decision being made using all available information for ethical reasons.

The primary within-trial health economic analysis calculated mean incremental cost per additional clinically significant PCa diagnosis via bpMRI vs. mpMRI approach (TB only), over approximately 60 days from study entry to multi-disciplinary team treatment decision. Secondary analyses calculate incremental cost per significant cancer diagnosed when incorporating SB results, and incremental cost per clinically insignificant PCa diagnosis avoided using bpMRI vs. mpMRI.

Costs from health services perspective were estimated by applying standard unit costs to resource use data captured within the trial and assigned according to hypothetical routes along the pathway.

The within-trial analysis is extended using decision analytic modelling to estimate incremental cost per QALY gained over lifetime horizon. QoL information is estimated from patient-level data collected by the same group from another study (PRECISION), and literature. Bootstrapping estimates uncertainty around costs in preliminary within-study analysis, and probabilistic sensitivity analysis will be used for costs and QALYs in the decision model. Sensitivity analysis calculates the incremental cost per QALY gained using microcosted MRI unit costs.

RESULTS

Four-hundred-and-ninety patients were included in preliminary analysis. Two fewer cases of clinically significant PCa were diagnosed via bpMRI pathway vs. mpMRI (141 vs. 143), and 1 fewer insignificant cancer over-diagnosed (51 vs. 52), i.e. no indication of clear superiority of either route. Mean (SE) per-patient cost for patients diagnosed with clinically significant cancer was £1,241 (£49) in the bpMRI pathway and £1,392 (£49) in mpMRI. Further secondary analysis and decision model are in progress.

CONCLUSIONS

Removing the DCE sequence could reduce scanning time, thus alleviating some impact of health service staff shortages on MRI wait time and allow more patients to access MRI sooner, thereby improving patient outcomes. The within-trial results were inconclusive, and the lifetime model should provide clarity regarding cost-effectiveness of bpMRI vs. mpMRI.

abs-os558 A Decision Model for the Cost-Utility of Screening Technologies in Ovarian Cancer

PRESENTER: **Jiunn Wang**, University of Exeter

Background

Ovarian cancer is the sixth most common cancer among women in the UK, accounting for over 4,000 deaths annually. Computed tomography (CT) scans are the current standard of care for assessing the extent of cancer and determining surgical suitability. However, CT scans have limitations, including difficulty distinguishing between malignant and benign adnexal masses, and accurately staging cancer progression. These limitations can lead to unnecessary surgeries, including removal of the ovaries, resulting in infertility. Such procedures also impose a significant economic burden on the National Health Service (NHS). Emerging evidence suggests that multiparametric MRI (mpMRI) may offer superior accuracy in characterising adnexal masses, potentially improving diagnostic precision. However, there is limited evidence regarding its impact on clinical decision-making and cost-effectiveness compared to CT scans.

Aim

This study aims to estimate the incremental cost per quality-adjusted life-year (QALY) gained from mpMRI and the combined use of mpMRI and CT, compared to CT alone, for suspected ovarian cancer.

Methods

A total of 461 ovarian cancer suspects were included in the trial. All patients underwent both a CT scan and a mpMRI scan as soon as practically possible after enrolment. Patients were then discussed at a local multidisciplinary team (MDT) meeting to determine the most appropriate treatment pathway. Initially, treatment decisions were based on CT scan findings, but critical mpMRI findings were revealed to the MDT, prompting reassessment of the original decision for ethical reasons. Three months after enrolment, the MDT reviewed the full mpMRI report and the combined CT and mpMRI report, recording theoretical treatment plans. Nine months after enrolment, the MDT reviewed all cases again and decided what should have been the optimal treatment.

We compared the final treatment decisions to those based on CT, mpMRI, and combined CT and mpMRI results to assess whether mpMRI improves concordance with the optimal treatment. A decision tree was constructed to model treatment options following screening, as well as subsequent complications and progression. The primary outcome was the incremental cost per QALY gained, calculated using EQ-5D and applying the area-under-the-curve approach with baseline utility adjusted. Costs included those associated with intervention and treatment, derived from national reference costs, as well as healthcare utilisation costs, derived by combining national unit costs with observed individual service use. Uncertainty was explored through probabilistic sensitivity analyses.

Initial results and conclusions

The probability of concordance was 82.43% for mpMRI and 83.08% for combined mpMRI and CT, compared to the 73.75% for CT alone. Among concordance cases, mpMRI and combined mpMRI and CT identified more appropriate benign surgeries (17.63% and 17.49%) compared to CT alone (9.41%). Whilst the intervention cost of mpMRI was higher than that of CT, total NHS costs were lower for mpMRI and combined mpMRI and CT compared to CT alone. QALYs were also higher for mpMRI and combined mpMRI and CT compared to CT alone, although the differences were minimal. These findings may inform clinical practices in screening for ovarian cancer suspects, suggesting that mpMRI could improve decision-making and reduce unnecessary healthcare costs.

abs-os564 Triaging Primary Care Requested Chest X-Rays Using Artificial Intelligence: A Cost-Effectiveness Analysis of the Lungimpact Study

PRESENTER: **Siyabonga Ndwandwe**, Clinton Health Access Initiative (CHAI)

Background:

Rapid diagnosis of lung cancer is essential for improving patient outcomes. A recent randomised controlled trial showed that immediate chest X-ray (CXR) reporting significantly reduced the time to lung cancer diagnosis, from a median of 63 days with routine CXR reporting to 32 days. This suggested potential benefits in health system efficiencies, patient outcomes and cost-effectiveness. However, not all patients benefit from direct CXR triage. Integrating artificial intelligence (AI) decision support into the pathway could avoid inefficiencies by promptly identifying a CXR with suspicious findings thereby prompting CT.

The UK's National Institute for Health and Care Excellence (NICE) recognises AI's potential in supporting existing pathways and improving workforce productivity. Nonetheless, evidence on the clinical and cost-effectiveness of integrating AI into the lung cancer diagnosis pathway across UK systems remain limited. This analysis assesses the incremental cost per unit reduction in time (days) from CXR to lung cancer diagnosis when using AI, from the healthcare perspective, compared to standard care. Additionally, we address a major limitation in contemporary economic evaluation methodology for diagnostic and screening studies by using aggregate data from literature and published audits for the control arm, allowing for robust evaluation when prospective data collection in control arm is constrained. This work is part of a larger study, LungIMPACT, which also evaluates the impact of CXR AI on time to CT and diagnosis of lung cancer.

Methods:

Our analysis uses a three-way decision tree analytic model over a 60-day horizon. Our three arms are: AI triage of CXR for urgent reporting with AI assistance for interpretation (arm 1), normal reporting (no triage) timing and AI only available when reporting (arm 2), and AI not available (standard care/control). We characterise reduction in time to cancer diagnosis in the two intervention arms using information from the LungIMPACT trial, which collected data from five large healthcare networks across the UK starting July 2023. The control arm outcome uses information from the literature and national audits. Differences in short-term costs are likely to depend primarily on the cost of setting up and delivering the AI facility, estimated as the cost to implement the AI support at the time of CXR acquisition and prioritisation for immediate review of CXRs, training costs, and maintenance costs. Unit costs will come from standard national datasets. Deterministic and probabilistic sensitivity analyses will explore parameter and methodological uncertainties.

Results and conclusion:

Based on preliminary data, the intervention arm has 68,043 CXRs from 63,919 patients, with 34,946 (51.4%) CXRs from arm 1 and 33,097 (48.6%) from arm 2. Females contributed 53.8% (n=36,631) CXRs. Uneven distribution of CXRs across healthcare facility networks, the leading facility accounted for 48.8% (n=33,214) with the least accounting for 7.7% (n=5,243). The latest National Lung Cancer Audit (NLCA) has aggregate data from 37 institutions (hospitals and cancer alliances) and 39,097 patients. These findings could be key in informing policies on AI adoption within the UK, advancing patient outcomes, improving health system efficiency, and workforce productivity. The analysis will be completed before the conference.

abs-os567 Cost-Effectiveness Analysis of Whole-Body MRI Cancer Screening in Rare Genetic Illness: Decision Model Using UK Prospective and Historical Data

PRESENTER: **Ms. Caroline S Clarke**, University College London (UCL)
AUTHOR: Jing Yi Jessica Weng

Background

Li Fraumeni syndrome (LFS) is a rare genetic condition with high cancer rates; >90% of women and ~75% of men with LFS develop cancers during their lifetime. Cancer surveillance recommendations include annual breast MRI or prophylactic mastectomy in women, brain/whole-body imaging, and dermatological review. Initial evidence suggests whole-body magnetic resonance imaging (WB-MRI) is useful, but annual WB-MRI in the UK not currently recommended as is lacking evidence regarding effectiveness and cost-effectiveness, particularly regarding possible earlier cancer diagnosis.

Aim

To estimate incremental cost per quality-adjusted life-year (QALY) gained on providing two WB-MRI scans over 12 months to adult LFS patients in London, UK, versus usual care, using lifetime horizon.

Methods

Small patient population (UK prevalence ~1000) renders randomised clinical trials unfeasible. Instead we used a prospective single-arm service evaluation cohort and compared to historical control group. Information on health outcomes (EQ-5D-5L, cancer diagnosis, death) and care pathway costs (hospital care, LFS and cancer management and treatments) allow creation of lifetime decision analytic model. National reference unit costs are applied to resource use items. QALYs are calculated using standard area-under-the-curve approach, adjusting for baseline utility and demographics. Uncertainty is explored using probabilistic sensitivity analyses and scenario analysis to test robustness to assumptions around historical control and alternative scenarios. Costs and QALYs discounted at 3.5%/year.

Prospective ("intervention") group

All LFS patients at site were offered two WB-MRIs, at baseline and 12 months. EQ-5D-5L was collected at both visits. Inclusion criteria: LFS diagnosis; age >18 years; informed consent. Exclusion: TP53 variant of low penetrance or unknown significance; cancer diagnosis in last 5 years (except non-melanomatous skin cancer or in-situ cervical carcinoma); malignancy symptoms; MRI contraindication.

Retrospective (historical control) group

Anonymised records on cancer diagnoses and treatments from 57 patients diagnosed with or treated for LFS between 2000 and 2022 were obtained from the site. Inclusion criteria: study entry date is the later of patient's LFS diagnosis or 18th birthday, with 5 years elapsed since last cancer or recurrence date (except non-melanomatous skin cancer or in-situ cervical carcinoma) and provided not receiving cancer treatment. Study entry date is before death or last follow-up. Exclusion: patients with non-pathogenic (or low penetrance, according to today's rather than contemporaneous definitions) TP53 variant or variant of unknown significance.

Initial descriptive results

54 patients in prospective cohort had WB-MRI at baseline and 49 (90.7%) at 12m. 4/54 (7.4%) cancers diagnosed at baseline, 5/54 (9.3%) diagnosed between scans, and 5/49 (10.2%) diagnosed at 12m, with no deaths in this group.

45/57 (78.9%) patients identified in retrospective dataset eligible for inclusion. Main ineligibility reason was presence of cancer. Mean (SD) follow-up time 10.9 (5.8) years. In first 12 months after inclusion, 3/45 (6.7%) diagnosed with cancer, 1/45 (2.2%) died and 1/45 (2.2%) lost to follow-up.

Conclusions and implications

This will be first UK economic evaluation of annual WB-MRI screening for LFS patients. Results will be put into context regarding implementation routes of optimal screening programme and potential policy changes. Methods used showcase achievement of comparative analysis in rare disease settings.

3:30 PM –5:00 PM TUESDAY [Health Care Financing & Expenditures]

os206 Bali International Convention Centre – Frangipani

Strategic Health Purchasing: Driving Health System Performance and Building Resilience

MODERATOR: **Mercy Mwangangi**, Amref Health Africa

CONVENER: **Frida Ngalesoni**, Amref Health Africa

DISCUSSANT: **Boniface Mbuthia**, Amref Health Africa

abs-os520 Against the Odds: A Case Study of Strategic Health Purchasing in a Fragile Health System in South Sudan

Disruptions in the delivery of quality health care in South-Sudan due to political conflict has weakened the health systems. The government capacity to finance service delivery is weak with only 2% of the public funding is committed to the health sector. The public finance management (PFM) systems are largely weak despite the passing of the PFM Act in 2011. The accountability of public funds remains low and hence majority of the budgets from donors are managed parallel to the government systems. The Health Sector Transformation Fund (HSTP) was created to pool external funding for health and hence serve to reduce fragmentation. Strategic Health Purchasing [SHP] is an important policy intervention to strengthen how the health system utilizes information on the population health needs and provider performance to effectively allocate resource to health providers even in a fragile setting like South-Sudan.

Aim:

To evaluate the progress made in the application of SHP reforms using the Strategic Purchasing Progress Tracking tool in South Sudan.

Methods:

We used the Strategic Purchasing Progress Tracking Framework created by Strategic Purchasing Africa Resource Center [SPARC] to guide data collection and analysis. We compiled descriptive information on [1] purchasing functions [benefit specification, provider contracting and payment methods [PPMs] and performance monitoring practices and their execution in the priority schemes [2] external factors and governance arrangements and how they are linked to SHP.

Results

The basic policy and legal framework established: despite a weak policy and legal framework reform MoH has developed Health Sector Strategic Plan II 2023-2027 sets the foundation through which reforms such as strategic health purchasing can be anchored on.

The MDTF is the surest way of applying SHP principles in South-Sudan: It remains largely but is the dominant source of funding for the health sector. Due to the joint nature of governance [both MoH and donors sit in the steering committee] and to ensure that it support MoH led health priorities. Currently it remains largely passive.

The state of purchasing functions: South Sudan has a Basic Health Package for Health and Nutrition that all schemes in the country are based on. The provider payment mechanisms are largely input based with providers automatically and informally engaged. The MDTF engaged both public and private [*not for profit*]. Performance monitoring exists but it is largely disconnected from purchasing decisions.

Local adaptation in the financing of the health sector applied right for the context: Through the MDTF partners can progressively grow the capacity of MoH to apply the principles of SHP in the administration of the fund. These capacities can then be passed on to the government.

Conclusion:

Layering on the existing legal and policy framework the country is still able to apply SHP reforms despite the fragility experienced to strengthen their ability to buy more health outcomes. The MDTF being the largest funding arrangement, most promising and capable of transferring skills and capacities to the MoH

abs-os515 Enabling Strategic Health Purchasing Through Resilient Primary Health Care Financing Arrangements in Malawi

Background:

In recent years, public health systems globally have experienced interruptions in the delivery of primary health care [PHC] by a range of issues, including climate change, conflicts, and emerging pandemics. These experiences highlight the importance of resilient PHC systems that can help prepare for emergencies, respond effectively, and maintain healthcare services during crises. Malawi a Low- and middle-income country [LMIC] has experienced climate change-induced extreme weather events compromising access to essential services, and increasing health risks and altering the ability to improve health outcomes for affected populations.

Aim:

We developed a PHC financing framework that provided health financing actors with a tool to analyze and gather information on opportunities for improving the resilience of PHC financing with emphasis on enabling PFM systems and processes to improve the resilient capacities of the system.

Methods:

A mixed method approach was used to include a document review of more than 57 documents to determine key elements and characteristics of a resilient health system together with key informant interviews from Ghana, Nigeria, Ethiopia, Kenya done to inform and strengthen the framework elements and benchmarks towards resilient PHC financing systems. The findings were then triangulated in two stakeholder forums held in Malawi and hosted by MoH.

Results

Applying the framework to the Malawi context revealed that:

On Resource Mobilization: The health sector heavily depends on donor funding, averaging 54.5% of total health expenditures (2016–2022), often as off-budget support. To reduce this dependency, mobilizing diverse can ensure a consistent funding flow. This approach enhances stability, supports long-term planning, and increases resources for resilient health systems

On Resource Budgeting: Rigid Public Financial Management (PFM) systems limit budget reallocation, hindering emergency responses. Advocacy for PFM reforms is needed to enable flexibility, particularly for the Department of Disaster Management Affairs. Flexible budgeting allows rapid responses to emergencies, such as disease outbreaks, supporting strategic purchasing and adaptability to shifting needs.

On Resource Allocation: Approximately half of the health sector budget is centrally managed by the Ministry of Health, limiting prioritization based on critical health needs. The ongoing pilot of Direct Facility Financing in one Malawian district of Rumphi shows promise for promoting fiscal decentralization.

On budget utilization: The Ministry of Health (MoH) consistently underspends its budget, in contrast, primary healthcare expenditures managed by Local Councils align with the Public Expenditure and Financial Accountability framework's standards for budget credibility. However, PHC facilities are not autonomous cost centers, which hampers strategic health purchasing and limits the development of a resilient health system.

On health financing governance: Strengthening governance through robust monitoring, transparency, and community engagement is crucial to prevent mismanagement, build trust, and support strategic purchasing aligned with health priorities

Conclusion:

When mobilization, allocation, and utilization align with strategic health purchasing goals, the health system becomes more adaptable, sustainable, and robust. Using the framework help actors visualize where country’s stand in the path towards resilient PHC financing identifying potential strategies to be taken to move the benchmarks towards more resilient health system

abs-os510 Strategic Health Purchasing as a Driver for Health Systems Resilience in Malawi

Background:

Only 10% of all the 54 countries have managed to allocate at-least 15% of the total government budget to health despite a firm commitment by heads of state in Abuja. While this goal remains a priority for many countries in Africa, we need to optimally use available resources for health

noting that between 20-40% of the health resources are wasted annually. Strategic Health Purchasing [SHP] is an important policy intervention to strengthen how the health system utilizes information on the population health needs and provider performance to effectively allocate resource to health providers.

Aim:

To evaluate the progress made in the application of SHP reforms using the Strategic Purchasing Progress Tracking tool in Malawi.

Methods:

In the study Amref Health Africa in collaboration with MoH used the Strategic Purchasing Progress Tracking Framework created by Strategic Purchasing Africa Resource Center [SPARC] to guide data collection and analysis. We compiled descriptive information on [1] purchasing functions [benefit specification, provider contracting and payment methods [PPMs] and performance monitoring practices and their execution in the priority schemes and [2] external factors and governance arrangements and how they are linked to SHP.

Results

Malawi's legal and policy framework provides for SHP implementation through the Health Sector Strategic Plan III and Health Financing Strategy 2023-2030 call out priority reforms on SHP. This combined with both political and technical support, the country to fast-track the needed reforms. **Progressive but consistent reforms towards SHP noted:** The third iteration of benefit specification review in the last 15 years, MoH purchasing health services from Christian Health Association Malawi [CHAM] using Service Level agreements, revision of a resource allocation criteria for district councils for the Direct Health Financing Facility [DHFF]. However, despite this most purchasing remains passive, especially those funded from health budgets.

Fragmentation of the performance monitoring practices: there are many actors, and management information systems (*both financial and health systems*) leading to fragmented practices and affecting the regular use of this information to influence purchasing decisions. **Limited capacity to sustain SHP reforms:** Malawi has a very small pool of health financing specialists to continue advocating for the implementation of strategic health purchasing, public finance management both at national and sub-national levels.

Local solutions for local problems: after the chicken gate scandal, the Joint Health Services Fund [JHSF] was established where major donors were able to pool funds. This presents a unique opportunity for donors in this program to support the government in advancing SHP principles as they allocate resources for health providers.

Conclusion:

Malawi is ready to continue applying health systems reforms to strengthen the implementation of health financing reforms. More bold steps are needed to initiate additional reforms on health financing, SHP, and Public Finance Management [PFM] especially by the District Councils. The health system has opportunities to draw lessons from the utility of SLAs with the private health sector to strengthen how MoH/District Councils engage with the public health sector facilities.

abs-os523 Strategic Health Purchasing the Surest way of Sustaining Health Systems' Performance in Zambia

Zambia has been identified as an exemplar country in the delivery of PHC cost effectively [Exemplars, 2024] In its effort to make progress towards the realization of Universal Health Coverage [UHC] goals the country has been implementing multiple reforms to strengthen its health systems both on the health budgets and developing the National Social Health Insurance Scheme as a prepaid scheme. Despite this the country faces complex health financing strains to include low fiscal space for health, high debt levels and delayed implementation of the decentralization policy in which health is one of the key services under consideration.

Aim:

To evaluate the progress made in the application of SHP reforms using the Strategic Purchasing Progress Tracking tool in Zambia.

Methods:

In the study Amref Health Africa in collaboration with MoH used the Strategic Purchasing Progress Tracking Framework created by Strategic Purchasing Africa Resource Center [SPARC] to guide data collection and analysis. We compiled descriptive information on [1] purchasing functions [benefit specification, provider contracting and payment methods [PPMs] and performance monitoring practices and their execution in the priority schemes. [2] external factors and governance arrangements and how they are linked to SHP.

Results

Legal and policy frameworks exist: The National Planning and Budget Act 2020, Public Finance Management Act 2018, Health Financing strategy 2017-27 and National Decentralization Policy 2023 provide great opportunities for further comprehensive reforms on SHP both at national and sub-national levels. There has been a delay in the implementation of the decentralization policy due to political and economic considerations

Small but sure reforms on purchasing functions have already begun: the existence of benefit specifications at MoH and NHIS, contracting arrangements for NHIS, and the use of a variety of provider payment mechanisms. **Lack of a clear way of purchasing PHC services, especially under MoH,** creates an opportunity for co-payments especially in urban areas. This creates a barrier to access to health services. Both PHC services [strategic programs and out-patient care at health facilities] are largely purchased through input-based approaches and are

largely passive.

Fragmented performance monitoring mechanisms: This limits the use of the findings in influencing the purchasing decisions. However, the recent passing of the health data governance policy provides an opportunity to strengthen data ownership and use.

Conclusion:

Continued reforms on health financing building on the existing policy and legal frameworks provides a promising opportunity to apply more SHP reforms in Zambia. This is expected to consolidate results and improve health outcomes.

6:00 PM –11:30 PM TUESDAY [Social Events]

Taman Bhagawan

Main Social Event

Wednesday

9:00 AM –10:30 AM WEDNESDAY [Health Beyond The Health System]

Bali International Convention Centre – Denpasar A

Sexual and Reproductive Health

MODERATOR: **Gabriella Conti**,

Ind-394 Mobile Technology and Contraceptive Knowledge and Use: Evidence from Indonesia

PRESENTER: **Adrianna Bella**

AUTHORS: Nicole Black, Dennis Petrie, Danusha Jayawardana, Teguh Dartanto

Abstract

Insufficient knowledge of reproductive health is one of the contributors to the unmet need for family planning and unintended pregnancies. The potential for mobile phone infrastructure to enhance public health awareness and behaviours, particularly around contraceptives, is especially promising in countries like Indonesia, where rapid mobile technological advances intersect with a significant unmet need for modern contraceptives.

This study examines the role of mobile technology in influencing contraceptive knowledge and use in Indonesia. Utilising data from the Indonesia Family Life Survey (IFLS) and the Village Potential Statistics (PODES), we employ a fixed-effects regression model with cohort, sub-district, year, and province-year fixed effects to examine the role of mobile signal strength in promoting contraceptive knowledge and use among women. Using area-level mobile phone signal strength rather than individual mobile ownership or usage frames our analysis within an intention-to-treat (ITT) approach. This approach offers a key advantage by alleviating selection concerns that certain individual characteristics might simultaneously drive the choice to own or use a mobile phone and the level of health knowledge. By focusing on mobile signal strength instead of individual ownership, this method also captures the broader impact of mobile technology on knowledge sharing within the community, allowing for spillovers from those with access to mobile phones to those without.

We find that while both strong and weak mobile signals are associated with increased awareness of contraceptive methods, the role of weak signals is more pronounced. Specifically, a shift in weak mobile phone signal strength from none to full coverage is linked to a 14.7 percentage point increase in the proportion of women who have ever heard of more than six contraceptive methods; however, we did not find a significant relationship between strong signals and ever heard of more than six contraceptive methods. A plausible reason is that sub-districts with greater increases in weak signal coverage likely had a higher proportion of villages with no signal and, consequently, lower initial knowledge, making even small improvements in connectivity lead to significant gains in access to information. When we disaggregated contraceptive knowledge by method type, this increase in awareness is driven primarily by knowledge of contraceptive films, while we did not find any robust association between mobile phone signal strength and other types of contraceptive methods. However, despite gains in awareness, we do not observe a significant uptick in actual contraceptive use.

The findings highlight the pivotal role that mobile phone signal strength can play in improving women's sexual health knowledge, particularly regarding contraceptive awareness. This suggests that mobile technology, even in areas with limited connectivity, can serve as a tool for disseminating sexual health information, potentially through mobile phone usage and transferring knowledge from mobile phone owners to non-owners. However, the study also emphasises that increased awareness alone may not necessarily translate into changes in contraceptive practices. Broader societal and structural factors can significantly influence the decision to adopt contraceptive practices.

Ind-666 How Structural Homophobia is Spreading HIV-Risk Sexual Behaviors Around the World

PRESENTER: **Vincent Leo Leroy, PhD student**, Aix-Marseille University
AUTHORS: Erik Lamontagne, Bruno Spire, Sean Howell, Sylvie Boyer, Bruno Ventelou

Background: Discrimination and stigma towards LGBTI population are recognized as potential determinants of HIV-risky behaviors. Yet, data on this issue remains limited: in particular, the “channels” that generate these effects are still uncertain. In addition, there is a critical lack of data regarding developing countries. The main objective of this paper was to fill this gap by analyzing the relationships between different dimensions of homophobia, propensions to take risks and HIV-risk sexual behaviors, in a worldwide sample. Methods: We used data from UNAIDS’s Global LGBTI Happiness survey conducted among 115 000 individuals in 204 countries and territories from May 2019 to January 2020. The survey was distributed worldwide through global and national social networks, mainly dating apps, civil society organizations, and activists. Structural equation modelling was employed to identify associations between homophobia and HIV-risk sexual behaviors in participants who self- identified as cisgender, transgender and non-binary gay, bisexual and queer. The model comprised i) UNAID’s recently developed homophobic climate index, as structural measure of homophobia; ii) a measure of experienced local discrimination (latent variable indicating the experience of verbal abuse and/or physical aggression because of sexual orientation or gender identity); iii) a latent variable assessing homophobic discrimination in the workplace; iv) a measure of family homophobia (variable indicating the family's non-acceptance); v) a general propensity to take risks variable; vi) a HIV-risk sexual behavior index (composite variable measuring unprotected anal intercourse with casual partners, at risk of HIV transmission or acquisition). Results: The final sample included 69 646 participants from over 180 countries. We found that the country's homophobic climate, defined as structural homophobia, predicted local homophobia ($\beta = 0.064$, $p<0.001$), homophobia at work ($\beta = 0.025$, $p<0.001$), family homophobia ($\beta = 0.21$, $p<0.001$) and HIV-risk sexual behavior ($\beta = 0.050$, $p<0.001$). Results indicate that local and at work homophobic prejudices are directly and positively associated with HIV-risk sexual behavior ($\beta = 0.093$, $p<0.001$; $\beta = 0.014$, $p = 0.031$). Structural homophobia was also indirectly associated with general risk-taking and HIV-risk sexual behaviour, mediated by individual homophobic attitudes. Conclusion: Our findings revealed positive associations between structural and individual stigma, and then risky behaviors that have been identified as a key determinant of the transmission of HIV among sexual minorities worldwide. Homophobia is still highly prevalent in societies and its elimination is a necessary condition in a world that aims to end HIV epidemic. We encourage policymakers to prioritize policies that intend to end homophobia and promote LGBTI rights.

Ind-1797 Analysis of Women Empowerment Factors in Contraceptive Use Decisions Among Married Women in Indonesia

PRESENTER: **Annisa Dwi Noviani**
AUTHORS: Gusti Dio Faiz Mahardika, Wahyu Hidayat, Nasywa Nayifa Salsabila, Achmad Kautsar, Kheren Honey Hutabarat

The population growth in Indonesia has been declining in recent years, influenced by various factors such as education level, the role of women in households, contraceptive use, and family planning information. In Indonesia, the use of contraception among married women has increased over the past three years, accompanied by improvements in women quality of life through various aspects, including education and labor force participation. objective of this study is to measure the factors of women empowerment and the level of economic conditions in relation to contraceptive use in Indonesia. This study uses a quantitative approach with a logistic regression model, involving 36,855 women of reproductive age in Indonesia, focusing on married women aged 10-49 years. This study used the latest data from the 2017 DHS (Demographic and Health Survey), with variables including both economic and non-economic aspects, such as women's empowerment (decision-making roles), education level, and other factors, such as place of residence and partner characteristics. The results indicate that higher education levels have a significant influence, with a 2.7% lower probability of using contraception. Better knowledge has provided women with more space to consider the health impacts of contraceptive use, while women who participate in the workforce have a significantly higher likelihood 1.6% of using contraception. Improved economic status also positively influences contraceptive use, with a 1.6% higher probability in the middle-income category and a 0.5% higher probability in the high-income category compared to women in the low-income category. The role of women in decision-making within the household also has a negative and significant impact on contraceptive use, with a 5% probability value. This study highlights the role of increased women empowerment in Indonesia, both from economic and non-economic factors, in influencing contraceptive decision-making. The research also emphasizes that women decisions regarding sexual relationships are considered key determinants of family planning. Research on women empowerment in Indonesia is still very limited. This study can serve as a reference for analyzing the factors that most influence contraceptive use and can also be considered when developing regulations for the family planning program in Indonesia.

Keywords: Contraception, Education, Empowerment, Family Planning

Ind-2055 From Private to Shared - Social Network Influences on Hysterectomy Decision-Making in India

PRESENTER: **Karan Babbar**, O P Jindal Global University
AUTHORS: Supriya Garikipati, Pritha Dev

This paper investigates the influence of social networks on women's decisions to undergo hysterectomies in India. We examine whether a woman's likelihood of having a hysterectomy is affected by the prevalence of the procedure among her peers, defined as other women of reproductive age residing in the same geographic cluster (neighborhood) using data from the National Family Health Survey (NFHS-5). To address the challenges of shared unobservables and simultaneity bias, we employ an instrumental variables approach with state fixed effects, comparing women in the same district but different peer groups. We instrument for peer hysterectomy rates using plausibly exogenous variation in the sex of the first child. Our results reveal a substantial positive peer effect: a 10 percentage-point increase in the peer hysterectomy rate is associated with a 5.3 percentage-point increase in a woman's own probability of undergoing the procedure. These findings, robust to falsification tests and various robustness checks, suggest that policies affecting hysterectomy rates will have spillover effects through social networks, implying that traditional analyses may underestimate their total social impact. Moreover, we find significant heterogeneity in peer

effects across public and private healthcare settings, highlighting the role of institutional context in mediating social influence. This suggests that targeted policies, such as regulations for private providers or public health campaigns promoting informed decision-making, could be particularly effective. *Keywords:* Hysterectomy, Peer Effects, Endogeneity, Instrumental Variable, NFHS-5, India.

9:00 AM –10:30 AM WEDNESDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Karangasem

Health and Healthcare Inequity

MODERATOR: **Beverley Essue**,

Ind-832 Effects of the Affordable Care Act on Income-Related Inequity in Health Care Delivery Among Working-Age Americans, 2008-2019

PRESENTER: **Jose Escarce**, University of California-Los Angeles (UCLA)

AUTHORS: Hao Yu, Yanlei Ma

Background: Policymakers in many countries agree that equity, achieved when use of healthcare services is based on medical need and not on any other characteristics of individuals, is an important goal for healthcare systems. Researchers have compared countries' systems on the degree of income-related inequity and found that "pro-rich" inequity, meaning that, given the same medical need, high-income persons systematically receive more care than their low-income peers, is higher in the U.S. than in other high-income countries. However, two recent policies in the U.S. would be expected to have reduced pro-rich inequity. Since 2001, the number and capacity of Federally Qualified Health Centers (FQHCs) has increased dramatically. More notably, in 2014 the Affordable Care Act (ACA) extended health insurance to millions of low-income, working-age (18-64) people. **Aim and Contribution:** Assess trends in income-related inequity among working-age persons in the U.S. between 2008 and 2019, a period encompassing six years before and six years following ACA implementation. The last U.S. study used data from 2008, and no study has examined the equity effects recent policies. **Methods:** Using 2008-2019 Medical Expenditure Panel Survey data, we analyzed income-related inequity among working-age persons for five utilization outcomes: medical care expenditures, ambulatory visits to physicians, primary care visits to physicians, internal medicine subspecialist visits, and emergency department (ED) visits. For each outcome and person, we obtained actual and predicted utilization, with predictions based on regressions using age, sex, and a wide array of health status variables to capture medical need. We used two-part models (logistic and GLM with log link) for expenditures and Poisson models with overdispersion for visits. Next, for each outcome and year, we used the convenient regression method to calculate the horizontal inequity index, which quantifies the degree to which utilization deviates from the normative standard. Finally, we regressed the inequity indexes for each outcome on a linear time trend allowing for different slopes and intercepts before and after ACA implementation in 2014. **Key Results:** We found pro-rich inequity at baseline for all outcomes except ED visits, with much higher inequity for subspecialist visits than for other visits. More strikingly, we found only very small reductions over time in pro-rich inequity for ambulatory visits to physicians and subspecialist visits, and no change in inequity for the other outcomes. Findings were unchanged in sensitivity analyses. **Conclusions:** Limitations of recent policies may explain our surprising finding of no appreciable reduction in pro-rich inequity. FQHCs are helpful but have limitations. Medicaid coverage may not lead to equitable access, especially to costly services like specialty care and advanced imaging. Additionally, low-income persons with marketplace coverage who do not qualify for the most generous cost-sharing subsidies may face affordability barriers to access. Although there is evidence that the ACA insurance provisions improved access to care for low-income persons, our analyses demonstrate the limits of health insurance in making care more equitable.

Ind-510 ADAM WAGSTAFF AWARD WINNING PAPER: Do Providers Contribute to Socioeconomic Inequalities in Health Care? An Audit Experiment in Tunisia

PRESENTER: **Rym Ghouma**

AUTHORS: Mylene Lagarde, Timothy Powell-Jackson

Background There is growing evidence that socioeconomic health disparities — differences in health outcomes between poor and richer populations — can result from variations in the quality of care patients receive. One important yet understudied cause is provider behaviour during a clinical encounter. We present novel evidence on the causal effect of a patient's socioeconomic status (SES) on doctors' provision of care in a primary care setting. Methods** We undertook an audit experiment to examine whether doctors treat patients differently according to their SES in the Grand-Tunis area of Tunisia. We sent standardised patients (SPs) with the same symptoms to 130 public and private primary care facilities for consultation varying only the SES of patients. Each facility was visited by two SPs, one was "poor" and one was "middle class". To align with the Tunisian context, the SES profiles were informed by in-depth qualitative research that went beyond just patient clothes to include aspects of language, physical appearance, and attitude to signal differences in SES. We assessed the care provided by doctors using a range of metrics on clinical quality, effort, and cost of care, as well as measures of effective communication. Findings** We found no evidence of SES differences in correct case management and clinical effort, although the rate of unnecessary treatment was greater for the poorer patients. Doctors prescribed less expensive drugs and gave significantly more free-of-charge drugs to the worse off, possibly driven by altruism towards poorer patients. In line with the literature on patient discrimination, we found significant differences in effective communication between patients: doctors were more likely to explain the diagnosis, give reasons for prescribing the drugs, and explain the treatment plan to richer patients compared to poorer ones. These results were not explained by time constraints as doctors spent comparable time with both patient profiles. Interpretation There are SES inequalities in some aspects of care, which are driven by the doctor, not the patient. Some of these differences, such as those in prescribing fewer expensive drugs and giving out more free drugs to the poorer patients, suggest concerns about higher provision of unnecessary and potentially harmful treatment to these patients. Other differences such as communicating less effectively to the poorer suggest prejudicial behaviour. To the extent that differences in communication with patients can lead to differences in patients' health decisions, our results suggest that doctors could contribute indirectly to health inequalities. Further research is needed to explain the drivers of

these inequalities and how to address them.

Ind-1959 Widening Inequalities in Cervical and Breast Cancer Screening in Kenya

PRESENTER: **Denis okova**, UNIVERSITY OF CAPETOWN
AUTHORS: Akim Tafadzwa Lukwa, Ataguba John

Background Breast and cervical cancer are the two most prevalent cancers and the leading causes of cancer deaths in both sexes in Kenya. As is the trend in many Low-and-Middle Income countries (LMICs), the incidence and mortality rates of breast and cervical cancer in Kenya are on the rise. This can be alleviated by screening to promote early diagnosis. In LMICs like Kenya, however, breast and cervical cancer screening opportunities are limited compared to High-Income Countries (HICs). Previous studies have largely examined the determinants of breast and cervical cancer screening with little efforts to assess related inequalities and decomposing the inequalities across household characteristics in Kenya. This is critical as the Kenyan government scales up screening initiatives. **Objectives** The study aims to examine trends in between-group and within-group socioeconomic related inequalities in the uptake of breast and cancer screening among eligible women. **Methods** This study used Demographic Health Survey (DHS) data sets of 2014 and 2022. Clinical breast examination (CBE) in women aged 18 and older was the indicator for breast cancer screening. Cervical cancer was indicated by “having gone for a cervical examination to check for cervical cancer” by women aged 25 and older. Normalized Errygyers concentration indices were computed to demonstrated whether cancer screening was pro-rich or pro-poor. The study then used the Theil index and decomposed the index by population subgroups (place of residence and socioeconomic status-SES) to understand within-between groups inequality. **Results** Over the two periods, the rates of cervical (15.03% versus 15.43%) and breast cancer (23% versus 24%) screening remained relatively unchanged. The Erreygyers normalised concentration indices for breast (2014; 0.15, p=0.00 & 2022; 0.13, p=0.00) and cervical screening (2014; 018, p=0.000 & 2022;0.16, p=0.000) for both periods were both positive indicating women of low SES are less likely to screen for both cancers. The Theil indices show that the socioeconomic inequalities in breast and cervical cancer screening for both periods were more dominant among women living in rural areas and those of low SES while the overall inequalities in screening of both cancers widened between 2014 and 2022. For cervical cancer screening, 96.4% to 97.1% of socioeconomic inequalities were explained by within-group household variability while 2.9% to 3.6% of the inequalities were explained the socioeconomic group which the women belongs to. A similar trend was observed with breast cancer screening. **Conclusion** Unequal distribution of household wealth as well as the rural-urban split enable the inequalities in breast and cervical cancer screening in Kenya. Thus, policies that bridge the rural-urban gap and those that address the within socioeconomic-group inequalities are vital. **Keywords:** Breast cancer screening, Cervical cancer screening, Inequalities, Socioeconomic status

Ind-2264 Unraveling Socioeconomic Inequalities in Unmet Healthcare Needs: Why Do They Persist Under Korea's Universal Health Coverage?

PRESENTER: **Inuk Hwang**, Graduate School of Public Health, Seoul National University
AUTHOR: Jongnam Hwang

Background:** Timely access to health care is of great concern to the general public, who anticipate no barriers to necessary health services regardless of an individual's socioeconomic status. However, a growing body of literature highlights that individuals with lower socioeconomic status (SES), particularly those with lower income and educational levels, have more difficulties accessing basic health care services irrespective of health status. Despite the achievement of universal health coverage through the National Health Insurance (NHI) in Korea, an inverse relationship between SES and unmet healthcare needs has been reported. This study aimed to assess socioeconomic inequalities in unmet health care needs among Korean adults over the past 13 years and to identify the major contributors to these inequalities.

Methods:** A total of 24,516 and 16,824 participants from the Korea National Health and Nutrition Examination Survey (KNHANES) in 2005 (Wave 3) and 2016–2018 (Wave 7), respectively, were included in the analyses. The analyses included respondents aged 18 and older who completed the health survey series in the KNHANES. Respondents with any missing values were excluded. To examine inequalities in unmet healthcare needs, the Concentration Index (CI), a widely used tool for measuring income-related inequality in health economics and policy research, was used. After calculating the CI, a decomposition method was applied to identify the major socio-demographic contributors to the observed inequalities between 2005 and 2016–2018. In addition to the decomposition of the CI, the horizontal inequity index (HI) was obtained to determine whether the observed inequality is a matter of inequity. For these analyses, the outcome variable was an individual's self-reported experience of unmet health care needs within the past 12 months. As the main indicator of SES, equivalized annual household income was used for the CI analyses. For the decomposition models, socio-demographic determinants were selected based on Andersen's Health Behavior Model.

Results: The CIs for unmet healthcare needs consistently showed negative values, indicating that individuals with lower income were more likely to experience unmet healthcare needs. However, the magnitude of the CIs decreased over time, from -0.241 in 2005 to -0.118 in 2016–2018. The HI, which captures the concept of equal care for equal need, also favored the poor during the given periods (2005: -0.191; 2016–2018: -0.153), suggesting that the observed inequalities in unmet healthcare needs in Korea are a matter of inequity. The decomposition of the CIs revealed that lower income and educational levels were the major contributors to the existing inequalities in unmet needs in Korea.

Conclusions: While the magnitude of inequalities in unmet health care needs has diminished over the last decade, socioeconomic inequalities under Korea’s National Health Insurance system persist. The reduction in unmet need-related inequality could be attributed to ongoing changes in services and user fees that have helped demolish financial barriers to necessary health services. To alleviate the remaining inequalities in unmet health care needs in Korea, expanding service coverage and improving accessibility to essential care at the community level should be considered as policy options.

abs-os81 Healing Gaps: The Role of General Practitioner-Patient Concordance in Health Outcomes

PRESENTER: **Elisa de Weerd**, Erasmus University Rotterdam

AUTHOR: Vahid Moghani

General practitioners (GPs) are the primary point of contact in the healthcare system and play a crucial role in patients' access to care. However, disparities in trust and communication exist, with patients indicating preferences for GPs that share similar characteristics. One proposed solution is to increase concordance between patients and provider, such as shared gender or background, to improve outcomes. This study investigates whether gender concordance between patients and GPs affects healthcare utilization and outcomes. Using Dutch administrative data (2013–2022) covering all GP practices and linked individual-level health records, we analyze variation in local access to female GPs across postal codes and over time. Focusing on areas with only one or two practices, we assess the effects of GP gender concordance on care use, including GP visits, prescriptions, and hospital care. Preliminary results suggest that female patients with access to a female GP have higher primary care utilization and higher hospital costs, with no evidence of differential sorting into areas with more female GPs. These findings can help inform strategies for reducing barriers in health care delivery.

9:00 AM –10:30 AM WEDNESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Executive Room 1

Economics of Breast Cancer Screening

MODERATOR: **Hansoo Kim**,

Ind-1574 Cost-effectiveness of a Polygenic Risk Score-Based Breast Cancer Screening Program in Three European Countries

PRESENTER: **Filipa Sampaio**

AUTHORS: Peeter Padrik, Krista Kruuv-Käo, Katrin Koiduaru, Neeme Tõnisson, Siim Sober, Andreas Karakatsanis, Evangelos Digkas, Luis Costa, Gonçalo Nogueira da Costa, Inna Feldman

Background Mammography screening is cost-effective and reduces breast cancer mortality, yet it misses a large proportion of cases below screening age. Women under 50 with breast cancer have a 30% mortality risk. Considering genetics and other risk factors is key to reducing breast cancer burden, opening way to personalized risk-based approaches to prevention. With limited research on the cost-effectiveness of PRS-based breast cancer screening, it is unclear whether PRS-guided screening is cost-effective compared to standard mammography screening. This study evaluated the cost-effectiveness of a breast cancer screening program using the isolated effect of polygenic risk score for women aged 35 years compared with current standard biennial age-based mammography in Estonia (age 50-69), Sweden (age 40-74) and Portugal (age 50-69). **Methods** A Markov model was used to conduct a cost-utility analysis and estimate the costs and health outcomes of the current mammography screening programs compared with a polygenic risk tailored screening program, adapted to women´s risk profile. The model simulated how a cohort of 1000 women aged 35 moved between the states healthy/at risk, Ductal Carcinoma In Situ (DCIS), stage I, II, III, IV cancer, and dead, and estimated cumulative costs and health outcomes over lifetime. Costs were estimated from a health-payer perspective. Risk profiles were sourced from clinical pilots in each country collecting familial, clinical and genetic information from country-specific samples of women (the BRIGHT study). Breast cancer stage distribution, incidence, screening uptake, mortality and costs were sourced from country-level sources. Breast cancer utilities were sourced from literature and adjusted to country-specific population utilities. Costs and health outcomes were discounted at country-specific annual rates. Costs were valued in 2022 €Euro. Model outcomes were incremental cost-effectiveness ratios (ICER), calculated as the difference in costs divided by the difference in quality-adjusted life-years (QALY) between strategies. Scenario analyses, one-way and probabilistic sensitivity analyses were conducted to test model assumptions. **Results** Preliminary results indicate that PRS-guided screening led to a redistribution of discovered cancer cases, with more early stage cancers, fewer advanced stage cancers, and breast cancer deaths averted, in a cohort of 1000 women, with variations across settings. Risk-stratified screening resulted in larger net costs mainly related to polygenic test and consultation costs, more life years gained and more QALYs gained, with relatively low ICERs. Findings were sensitive to the uncertainty around risks estimates of developing breast cancer and in variations in discount rate. Probabilistic analysis showed that PRS-guided screening was likely to be cost-effectiveness at local WTP values. **Conclusions** PRS-guided screening integrated into standard breast cancer screening programs in Estonia, Sweden and Portugal may yield clinical benefits and has the potential to be cost-effective at existing local WTP thresholds. Further studies are needed to address data limitations and reduce uncertainty in model outputs.

Ind-1603 Cost-effectiveness of Artificial Intelligence in Breast Cancer Screening

PRESENTER: **Joanne Scarfe**

AUTHORS: Luke Marinovich, Alison Pearce, Nehmat Houssami

Background: Breast cancer screening in Australia involves two radiologists reviewing each mammogram with discordant results resolved by a third radiologist. The process is subjective and may lead to true positives, false positives, or missed cases due to reader error or because the cancer is not visible to the reader. Artificial intelligence (AI) algorithms for interpreting mammograms can potentially improve the effectiveness of population breast cancer screening programs if they can reduce the number of cancers 'missed' by radiologists. In addition, AI may address radiologist shortages, reduce reader workload and costs, and lower health system expenses through early detection and diagnosis, supporting screening program sustainability.

Research aim: Our objective was to investigate the cost-effectiveness of integrating AI into breast cancer screening from an Australian health care system perspective.

Methods: Using decision analytic modelling we assessed the incremental cost per additional cancer detected. We compared standard breast cancer screening practice with three AI-human screen reading strategies: AI replacing one human reader (Integrated); AI triage with human single-reading for low-risk screens (Triage Single); and AI triage with no human reading for low-risk screens (Triage Only) simulated in a retrospective cohort of 108,970 consecutive mammograms from women aged 50-74 years from 2013-2016 in an Australian breast screening service (BreastScreenWA). The two-year model incorporated cancer detection and recall rates. One-way and probabilistic sensitivity analyses explored uncertainty around costs and effects. Using prospective trial data (Lång et al., 2023), scenario analyses explored the impact of improved AI performance on cost-effectiveness.

Results: All AI-human strategies were less costly but slightly less effective than Standard. Triage Only was the most efficient with an average saving of $4 per cancer detected, but detecting 0.000521 fewer cancers per person screened compared to Standard (equivalent to 0.521 fewer cancers per 1,000 people screened). This resulted in an incremental cost-effectiveness ratio (ICER) in the south-west quadrant of the cost-effectiveness plane, with a saving of $8,206 for each cancer *not* detected. Cost savings for Triage Only were primarily driven by having no human reading for the 50% of screens triaged as low-risk for breast cancer by the AI. Sensitivity analysis indicated the ICER was most sensitive to uncertainty around the cost of human screen reading and interpretation. Scenario analyses showed that a modified version of Triage Single, where only screens classified as 'high risk' (<10%) underwent double-human reading, improved effectiveness but increased costs (ICER = $587 per additional cancer detected) compared to current practice.

Conclusions and implications for policy and practice: This study represents one of the few economic evaluations comparing AI-supported mammogram reading with human reading, and the only health economic evaluation which has used patient-level data in a real-world population breast cancer screening setting. While the AI algorithm used in this study is unlikely to be cost-effective based on our retrospective data, improved outcomes seen in prospective trial data suggest AI-human screen reading could be cost-effective in the future. Breast cancer screening programs should therefore be considering now how they might implement AI technology in the future. 2

Ind-1943 Cost-Effectiveness Analysis of BRCA1/2 Screening for Breast Cancer and Ovarian Cancer Early Detection Among Chinese Women

PRESENTER: **Yaqun Fu**, Peking University
AUTHORS: Li Yang, Xia Wei

Background In 2022, approximately 19.96 million new cancer cases were reported globally, with breast cancer (BC) emerging as the most commonly diagnosed female cancer. It accounted for 2.31 million cases, representing 15.4% of total female cancer deaths. In China, breast cancer in women accounted for 0.36 million new cases and 75,000 deaths. Although the usage of multi-cancer screening technology becomes more and more popular internationally, the cost-effectiveness results were controversial across high-income countries and low- and middle-income settings, as well as among populations with differing levels of risk. Morevoer, there is a lack of evidence specific to the Chinese context.

Objective This study aims to examine the cost-effectiveness of BRCA 1/2 genetic testing for the early detection of breast and ovarian cancer (OC) among Chinese women aged 20 and older across different risk levels.

Methods: A Markov model was developed to assess the cost-effectiveness of various screening strategies for the early detection of BC and OC from a societal perspective over a lifetime horizon. The screening methods include BRCA1/2 testing for all age eligible women, BRCA1/2 testing for high-risk women (BC patient's relatives, Gail assessment ≥1.67%, a history of chest radiotherapy, etc.) and routine screening without genetic testing (mammography and ultrasound for low-risk population, and MRI for BC high-risk population and CA125 and transvaginal ultrasound for OC high-risk population). Total costs, quality-adjusted life years (QALYs), and net monetary benefit were generated for each strategy, and incremental cost-effectiveness ratio (ICER) was calculated by comparing each strategy to routine screening. Sensitivity analyses were conducted for decision-making in providing and prioritizing BRCA testing.

Results: When the willingness-to-pay (WTP) threshold was set at 1-fold GDP per capita in China in 2023 ($12,635.22), BRCA1/2 genetic testing for the general population resulted in an incremental cost of $5,153.58 with a gain of 0.125 QALYs, yielding an ICER of $41,228.66/QALY, and was not cost-effective compared to routine non-genetic screening. In contrast, BRCA1/2 testing for high-risk groups was cost-effective, with an ICER of $1,657.01/QALY compared to routine non-genetic screening. The net monetary benefit of routine screening, BRCA1/2 testing for the general population, and BRCA1/2 testing for high-risk only were $756,572.16, $752,993.18, and $757,949.50, respectively. The results were robust through the sensitivity analyses. The three most influential factors affecting cost-effectiveness were cancer incidence for BRCA mutation carriers, BRCA mutation rate in the general population, and the utility associated with cancer status. Probabilistic sensitivity analysis indicated that at a WTP below $2262.40, routine screening strategy had a 99% probability of being cost-effective. As the WTP increased, BRCA1/2 testing for high-risk groups became more likely to be cost-effective, and at a WTP of 1-fold GDP per capita or higher, it had a 99.8% probability of being cost-effective compared to other strategies.

Conclusions Performing BRCA1/2 testing on high-risk Chinese women for the simultaneous early detection of BC and OC simultaneously is cost-effective compared to routine screening. However, genetic testing for the general population is not cost-effective in the Chinese context.

Bali International Convention Centre – Jakarta A

Factors Influencing Patient Health and Health Care

MODERATOR: **Karinna Saxby**, Monash University

Ind-2148 Cumulative Incremental Budget Impact of Drugs For Chronic-Degenerative And Rare Diseases in The Brazilian Public Health System Between 2014 And 2024

PRESENTER: **Everton Nunes da Silva**, University of Brasilia
AUTHORS: Daniel da Silva Pereira Curado, Laís Lessa Neiva Pantuzza, Ana Carolina de Freitas Lopes, Amanda Oliveira Lyrio, Mariá Gonçalves Pereira da Silva

Background: Since 2012, all drugs dispensed in the Brazilian public health system (SUS) must be incorporated by the National Committee for Health Technology Incorporation (Conitec), which also assesses budget impact analyses (BIA). Despite health budget constraints and concerns about drug financing in Brazil, including high-cost drugs for rare diseases, the cumulative incremental budget impact (IBI) of drugs incorporated by Conitec over the years (beyond the BIA time horizon) is unknown. Thus, our aim was to estimate the per capita costs and cumulative IBI values of drugs for chronic-degenerative and rare diseases in the SUS between 2014 and 2024.

Methods: Based on the 2014-2024 public reports of the Conitec, data were collected on proposals for the incorporation of drugs for chronic-degenerative and rare diseases into the SUS. The proposals were categorized by the type of disease (rare or other chronic) and incremental budget impact (IBI) (incremental or cost-saving). Per capita costs were calculated by dividing the IBI values by the estimated population of each BIA. Then, the median and interquartile range (IQR) of per capita costs were obtained for all BIAs and for rare diseases and other chronic diseases, separately. In addition, the cumulative IBI values between 2014 and 2029 were calculated and adjusted by interpolation in the years beyond those considered in each BIA and by the Brazilian inflation rates, for 2024. The values were collected in BRL and converted to dollars, considering the World Bank's purchasing power parity (US$1 = BRL 2.44), referring to 2023 (most recent data available).

Results: Among all 106 BIA, 65.09% (n=69) resulted in incremental costs. Thus, both analyses involving rare diseases and other chronic diseases mostly represented incremental costs [70.45% (n=31) and 61.29% (n=38), respectively]. On the other hand, other chronic diseases were more cost-saving than rare diseases [38.71% (n=24) vs 29.55% (n=13), respectively]. Regarding per capita costs, the values for other chronic diseases tended to be lower than those for rare diseases [median of US$86.75 (IQR: -US$592.62 and US$832.34) vs median of US$3,914.36 (IQR: -US$496.60 and US$114,406.94), respectively]. The cumulative IBI values with interpolation were increasing, with US$9.49 million in 2014, and reaching a maximum value of US$1.85 billion in 2023, which remains relatively stable until 2029. However, when data interpolation is not considered, the cumulative IBI values were decreasing from 2024 onwards (below US$609.34 million, up to -US$140.82 million in 2029).

Conclusions: Following the global trend, the incorporation of drugs for rare diseases represented higher per capita costs and were less cost-saving than for other chronic diseases. Combined with the growing accumulated IBI, equivalent to approximately 40% of the Brazilian budget for drugs for these diseases in 2024, the next incorporations by Conitec should better consider Brazil's budget capacity, so as not to pose risks to the sustainability of the SUS. Meanwhile, Brazilian healthcare investments should prioritize health equity, not leaving specific populations unassisted, since innovative drugs, especially for rare diseases, have had increasingly higher prices due to investments in clinical research.

Ind-1730 Does the Charitable Medical Assistance Program Impact Catastrophic Medical Expenditures for Families of Children with Leukemia?

PRESENTER: **Xiaojie Sun**
AUTHORS: Jun Su, Yuqing Zhang

Background: Pediatric leukemia is the most prevalent childhood cancer in China, exerting a considerable financial impact on affected families. Despite the mandatory participation of all Chinese children in the Resident Basic Medical Insurance, out-of-pocket (OOP) expenses remain substantial for families of children with leukemia. However, charity assistance has been shown to help mitigate these financial burdens. The "Love Union Project" is a comprehensive charitable medical assistance program designed to support families of children with leukemia within China's multi-tiered healthcare security system. This study was designed to evaluate the impact of the " Love Union Project " on reducing the incidence of catastrophic health expenditure (CHE) among families of children with leukemia in China.

Methods: The study was based on a charitable medical assistance program-" Love Union Project ". The intervention group consisted of 85 children from H city who received the assistance of the program. The control group was comprised of 36 children from S and Y cities, selected to match H city in terms of comparable social and economic status. The basic demographic characteristics, medical expense expenditures, and project assistance information of pediatric leukemia patients and their caregivers were collected in this study. Non-normally distributed costs were reported as the median and interquartile range. After adjusting for other factors, multivariate logistic regression analysis was employed to examine the impact of the "Love Union Project" on the incidence of CHE.

Results: After medical insurance reimbursement, the intervention group's median OOP expenditure was CNY230,000($31,874), and the control group's median OOP was CNY217,200($30,100). However, with the program's additional reimbursement, the intervention group's median OOP expenditure was reduced to CNY 201,300 ($27,896). Thanks to the program's intervention, the CHE rate among the intervention group decreased from 75.3% to 65.9%, while the incidence of CHE in the control group was 75.0%. Compared to families with children aged 0-6

years, those aged 7-12 were more likely to incur CHE (OR 5.224; 95%CI 1.412-19.322). Families with five or more members were also at higher risk of CHE than those with four members or fewer (OR 2.847; 95%CI 1.056-7.676). Additionally, families with a monthly income of CNY8000($1,120) or more were less likely to experience CHE than those with a monthly income of CNY4000($560) or less (OR 0.257; 95%CI 0.072-0.923). Lastly, families receiving assistance from the "Love Union Project" reported significantly lower CHE rates than those who didn't receive such support (OR 0.151; 95%CI 0.044-0.524).

Conclusion: This study suggested that medical insurance offered a limited buffer against these financial strains; however, the " Love Union Project " enhanced the economic resilience of families of children with leukemia, playing a crucial role in the multi-tiered medical security system. It is essential to pay specific attention to a subgroup of pediatric patients who are younger, belong to larger households, have lower monthly incomes, and have not yet received support from charitable medical assistance.

Ind-152 Potential Impact of Immunisation on Infectious Diseases Related Out-Of-Pocket Expenditures and Catastrophic Expenditure on Indian Households

PRESENTER: **Habib Farooqui**, Qatar University
AUTHORS: Anup Karan, Giridhara Babu

Background: Immunisation remains one of the most effective and cost-effective interventions for the prevention of childhood morbidity and mortality. Recent research has reported the benefits of childhood immunization on demographic transition, schooling attainment, and earnings. However, the impact of childhood immunization on financial risk protection at the household level has not been estimated and reported for India. The core objective of this research was to answer - what is the impact of the universal immunization program (UIP) on infectious disease occurrence and related out-of-pocket expenditure and catastrophic expenditure at the household level in India? **Methods:** We analysed the 75th round of the National Sample Survey of India data (NSSO 2017-18). We employed regression models to measure the impact of UIP on infectious disease occurrence and financial risk protection measures among the households exposed to UIP vis-à-vis unexposed households. The exposure to the UIP was a binary variable: 1, if the household reported immunized children in the household and 0, otherwise. The immunisation status of the child was also binary: 1, if the child was fully immunized (has received the following UIP vaccines i.e., BCG, all doses of polio vaccine including booster dose, all doses of diphtheria-pertussis-tetanus (DTP) including booster dose, and measles) and 0, otherwise. We considered the following outcome indicators: i) percentage of households reporting any infectious disease; ii) percentage of households reporting out-of-pocket expenditure ii) per household per capita out-of-pocket expenditure per episode and iii) percentage of households reporting catastrophic expenditure. **Results:** We find that households exposed to UIP have a 10.7% (95% CI: 10.4% -10.9%) lower probability of hospitalization and a 0.5% (95% CI: 0.01% - 0.9%) and 0.7% (95% CI: 0.3% - 1.2%) lower percentage of households incurring out-of-pocket expenditure (OOPE) and catastrophic expenditure, respectively. Similarly, the probability of outpatient care was 5.4% (95% CI: 5.3% - 5.6%) lower in households exposed to UIP and the percentage of households incurring OOPE was -0.8% (95% CI: 0.00% - 0.16%) lower in households exposed to UIP compared to unexposed. However, the percentage of households reporting catastrophic out-of-pocket expenditure was only marginally lower by 0.1% (95% CI: -0.4% - 0.2%). Furthermore, there was heterogeneity in the outcomes across rural and urban areas and the magnitude of the potential impact of immunization on the reported outcomes was significantly higher in the urban areas as compared to rural areas. **Conclusions:** We recommend sustainable financial allocation to immunization programs to improve household-level health and economic outcomes.

Ind-2804 Effect of Supplemental Private Health Insurance on Suicidality Among South Korea's National Health Insurance Enrollees

PRESENTER: **Ara Yoon**
AUTHORS: Donggyo Shin, Jangho Yoon, Seungbeen Ghim, Minjeong Kim, Hyunwoung Shin

Aim: As one of the nations with the highest suicide rates, South Korea has persistently topped suicide rates for nearly two decades among OECD countries. This research examines whether supplemental health insurance coverage within a universal healthcare system may have a preventive effect on suicidality. Specifically, we examine the effect of supplemental private health insurance (PHI) on suicidal ideation among South Korea's National Health Insurance (NHI) enrollees. The NHI scheme provides controlled benefits for approximately 97% of the population; however, over 80% of NHI enrollees also have supplemental private health insurance (PHI) due to the limited coverage provided by the NHI. Our rationale is that supplemental health insurance, which covers additional out-of-pocket costs and certain non-covered treatments, may help reduce suicidality by alleviating financial strain and ensuring more stable access to mental and physical healthcare services.

Methods: We analyze data drawn from the 2011-2018 Korean Health Panel Survey, a nationally representative sample of non-institutionalized Korean citizens. The sample includes 101,349 observations on 23,644 unique individuals aged 18 and older. Suicide ideation is measured as "having suicidal thoughts or impulses in the past year." We use a probit model to assess the overall relationship between PHI coverage and suicide ideation. We also estimate effects of PHI type (fixed vs. indemnity) for those with PHI. Additionally, we construct a recursive simultaneous-equations model, consisting of two sequential equations, examining a pathway through which PHI coverage affects suicide ideation. In Stage 1, having unmet healthcare need due to cost is modeled as a function of having a PHI and other determinants of access to care. In Stage 2, suicide ideation is modeled as a function of 'unmet healthcare needs due to cost' and other determinants of suicide ideation. We utilize a bivariate probit procedure to jointly estimate the equations. Estimates are survey-weighted. We adjust standard errors for intraclass correlation and obtain average marginal effects.

Results: Over the study period,** the rate of PHI consistently increased from 76.2% in 2011 to 82.8% in 2018. In contrast, both unmet healthcare needs due to cost and suicide ideation declined gradually. The rate of unmet need decreased from 3.4% in 2011 to 1.8% in 2018, and the rate of suicide ideation similarly declined from 3.9% to 1.8%. Overall, having PHI is associated with a 0.43 percentage-point decrease in the

rate of suicide ideation (p<.001), accounting for 9.7% of the suicide ideation rate among those without PHI (4.45%). This relationship holds among non-elderly adults aged 18 to 69 but not among those aged 70 years or older. Among individuals with PHI, PHI type does not show a significant association with suicide ideation. Bivariate probit estimates support the hypothesized pathway: PHI is associated with a 0.62 percentage-point decrease in the likelihood of having unmet need (p=.001), and, subsequently, unmet need is associated with a 4.6 percentage-point increase in the likelihood of suicide ideation (p=.003).

Conclusion: Supplemental PHI coverage significantly reduces unmet healthcare needs due to cost among adult NHI enrollees in South Korea and, thereby, lowers rates of suicide ideation.

Ind-62 Reciprocal Relationship between Cognition and Depression Among Chinese Middle-Aged and Older Adults:the Mediating Role of Internet Use

PRESENTER: **ZhiChao Wang**

Objective :Prior work has identified an inverse relationship between depression and cognition in older adults, but the mechanisms underlying this association remain unclear. This study investigated whether internet use mediates this relationship in middle-aged and older adults.

Method : Data came from the 2015, 2018 and 2020 waves of the Chinese Longitudinal Healthy Longevity Survey (n = 9,610). The random intercept cross-lagged panel model (RI-CLPM) combined with mediation analysis was used to determine the relationship between cognitive function and depressive symptoms and the mediating effect of internet use on the ascertained cognition–depression relationship. Mediating effects subgroup analyses included middle-aged (45–64 years) and older (65+ years) adults.

Results: At the between-person level, a significant negative correlation was found between cognitive function and depressive symptoms. Within-person analysis revealed a bidirectional relationship: poorer cognitive function predicted increased depressive symptoms ($\beta^* = -0.080$, $p < 0.001$), and conversely, increased depressive symptoms predicted poorer cognitive function ($\beta^* = -0.019$, $p < 0.05$). Internet use partially mediated this relationship, accounting for 8.58% and 9.69% of the total effects, respectively. This mediating effect was stronger in middle-aged adults than in older adults.

Conclusions: This study notes a bidirectional association between cognitive function and depressive symptoms from a nationally representative five-year follow-up sample, and this relationship is partially explained by their impact on Internet use. These results emphasize the continued importance of exploring multidisciplinary interventions to mitigate depressive symptoms and delay cognitive decline in middle-aged and older adult populations.

Keywords: Cognitive function, Depression, Internet use, longitudinal study, mediation analysis, Random intercept cross-lagged panel model , Chinese middle-aged and older adults

Ind-765 Exploring the Impact of Broadband Access on Nutrition Assistance Benefit Utilization

PRESENTER: **Qi Zhang**, Old Dominion University

Background The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) ranks as the third-largest nutrition assistance initiative in the United States, serving over 6 million low-income women, infants, and children under five. While WIC benefits are provided free of charge, underutilization remains a significant issue, with redemption rates as low as 5%, posing heightened nutritional risks. Technological tools like WIC shopping apps and online ordering systems have been introduced to address this, all of which rely on broadband access. However, broadband availability varies significantly across U.S. counties, potentially affecting program outcomes. **Research Objective** To investigate the relationship between broadband internet access and WIC benefit redemption rates among participating households. **Methods** As a federally funded but state-administered program, the WIC state agencies often maintain restricted access to household-level redemption data. We worked with the Oklahoma WIC agency and obtained the 2020 WIC redemption data to estimate average redemption rates. County-level broadband access was assessed using three data sources: 1. **Federal Communications Commission (FCC) Data:** Determined if at least 90% of a county had a broadband provider. 1. **American Community Survey (ACS) Data:** Measured broadband subscription rates of at least 60% among county residents. 1. **Ookla's Open Data Initiative:** Calculated average mobile network speeds (minimum 25 Mbps download and 3 Mbps upload). A fractional logit regression model was applied, accounting for socio-demographic factors at both household and county levels. The average COVID-19 incidence rate at the county level was controlled to account for the effect of the COVID-19 pandemic on the benefit redemption in 2020. **Results** The study analyzed data from 65,190 Oklahoma WIC households, revealing significant disparities in broadband access across racial and ethnic groups. For example, Hispanic households exhibited the highest broadband access rates, while non-Hispanic Black households had the lowest (P < .001). Households with children or larger household sizes demonstrated greater broadband access (P < .001). Broadband access correlated positively with redemption rates: - **FCC data:** Redemption rates of 50.3% (with access) vs. 43.0% (without access). - **ACS data:** 50.3% (with access) vs. 42.9% (without access). - **Ookla data:** 48.7% (with access) vs. 42.5% (without access). Regression analysis showed that FCC broadband availability significantly boosted redemption rates (Coefficient = .029, P < .001), as did ACS broadband (Coefficient = .012, P < .001) and Ookla mobile internet (Coefficient = .018, P < .001). **Conclusions** This pioneering study highlights the positive impact of broadband internet access on WIC benefit redemption rates. By leveraging household-level transaction data, the findings underscore how enhanced broadband infrastructure can improve program utilization and contribute to the long-term health of WIC participants. 2

Ind-1894 Women's Income And Household Nutrition And Diets

PRESENTER: **Priya Bhagowalia**
AUTHOR: Arjita Chandna

As per the Global Hunger Index 2021, 15.3% of India's population is undernourished and deficient in protein consumption (von Grebmer et al., 2021; Kolady et al., 2021). Since the Covid-19 pandemic, household nutrient consumption may have declined further due to supply and demand side factors such as lockdowns, income losses, and inaccessibility of government food safety nets (Gupta et al., 2022). Assuming that the household head and his/her spouse are the primary members who influence household nutrition, we examine the association between women's income and household nutrition using panel data. Men and women may have different consumer preferences and their ability to influence household consumption allocation depends on their relative bargaining power (Chiappori, 1992; Opata et al., 2020). Therefore, we test the association of primary woman's income (the head or the spouse of the head) as a share of the total income of the primary couple with household nutrition, using indicators that capture the quantitative as well as compositional aspects of nutrition. Second, we explore if the presence of other adult members, especially those, that may be in a hierarchical relationship with the primary woman, influences household nutrition. Using the India Human Development Survey (IHDS, 2005, 2011), we convert monthly consumption of food to household level macronutrient intakes. Food groups consumed in the last thirty days are added to get a food variety score (FVS). We also calculate Berry's index of diet diversity that indicates degree of household's diet concentration between food groups. The primary woman's income share is calculated by adding wages/ salary, government benefits, and notional farm income. OLS and LPM models, with household fixed effects test the impact of the primary woman's income on macronutrient consumption and FVS. Our results show that the primary woman's income share has a positive and significant association with household calorie intakes especially those obtained from carbohydrates; significant negative association with calories from fats; no association with calories obtained from proteins and a negative and significant association with diet diversity. Additionally, the positive association of the primary woman's income share with household calorie intake is weaker in the presence of other educated women having hierarchical relationships with the primary woman. The study underscores the importance of women's relative bargaining power in improving household nutrition. We find that a greater share of income controlled by the primary woman could improve household calorie and macronutrient intake, but may not necessarily lead to a balanced consumption of macronutrients. Additionally, an increase in the relative number of earning women within the household strengthens the impact of primary woman's income share. Our results suggest that provision of basic income to the women head of the families could improve household calorie, protein, and carbohydrate intakes. However, the effectiveness of such gendered income policies may depend on the household hierarchical structure. Our results although based on a sample from India, may be applicable to developing countries which may use universal basic income as a tool to improve malnutrition and health.

Ind-684 What to Expect WHEN You Are Expecting (War is Over)

PRESENTER: **Camilo Antonio Arias**, Universidad de los Andes (Bogotá)

This study examines the consequences of ending armed conflict on health at birth using a natural experiment in Colombia: the ceasefire between the government and FARC guerrillas. We analyze administrative records of over 5 million births (2011-2018) using a difference-in-differences approach that compares variations in birth outcomes over time between municipalities with high and low exposure to the ceasefire. We find that the end of conflict affected fetal loss rates by evaluating the probability of male births. We identify two countervailing effects on birth weight by analyzing birth weight distribution. The end of the conflict increased the number of births with very low weights, as weaker newborns could survive. Conversely, reduced maternal stress led to a higher probability of births with elevated weights. These effects were more pronounced in municipalities without the presence of other illegal armed groups. Finally, we find evidence that the end of the conflict increased the likelihood of births attended by medical personnel and the frequency of prenatal visits by mothers.

Ind-1736 Wide-Field Digital Imaging for Universal Neonatal Eye Screening: Integrating Evidence on Feasibility and Economic Implications

PRESENTER: **Khairil Idham Ismail**

AUTHORS: Izzuna Mudla Mohamed Ghazali, Che Sarida Che Ismail, Roza Sarimin

Background Childhood vision impairment poses significant challenges to public health, particularly in Malaysia, where preventable cases remain prevalent. In Malaysia, the high incidence of preventable childhood vision impairments underscores the need for its early detection through eye screening. Red Reflex Test (RRT), has been the standard method but suffers from low sensitivity and limited field view. Wide-Field Digital Imaging (WFDI) offers improved sensitivity and broader diagnostic capabilities. This study integrates a systematic review and economic evaluation to assess WFDI's feasibility, effectiveness, safety, and economic implications for universal neonatal eye screening (UNES). **Research Aim** To evaluate the effectiveness, safety, and economic feasibility of WFDI for neonatal eye screening compared to RRT, highlighting its potential role in UNES. **Methods** A systematic review following PRISMA guidelines identified relevant studies from databases including Medline and PubMed up to May 2024. Evidences were critically appraised, extracted, analysed and synthesized narratively. The economic evaluation utilized the ARIMA model (2008–2022) to project the number of newborns eligible for screening from 2026–2030. The clinical pathway for WFDI involves trained nurses performing imaging for non-ROP-risk newborns, with ophthalmologists interpreting results. Screening costs for WFDI and RRT were calculated, including human resources, consumables, and infrastructure. Sensitivity analyses examined cost variations under differing coverage scenarios. **Key Results** Following inclusion and exclusion criteria, eleven studies comprised of three cohort studies, seven cross-sectional studies and budget impact analysis finally included for this review. The review demonstrated WFDI's superior sensitivity in detecting anterior and posterior segment pathologies such as hyphema, CMV retinitis, and vitreous hemorrhage. Detection rates ranged from 4.7% to 41.2%, with an average number needed to screen (NNS) of 5.9. Between 11.1% and 59.4% of detected cases required follow-up or intervention, underscoring its clinical utility. Safety data confirmed WFDI as a USFDA-approved Class II device with no significant adverse events reported. Economically, WFDI screenings were projected to cost RM 49.48 per session compared to RM 2.62 for RRT, with a five-year implementation cost of RM 97.7 million versus RM 5.2 million for RRT. While initial costs are higher, WFDI has the potential to reduce long-term visual impairment costs. Sensitivity analyses revealed implementation costs ranging from RM 8.8 million (minimum case) to RM 36.3 million (maximum case) under 100% coverage. **Conclusions** WFDI demonstrates clear clinical advantages in neonatal eye screening, offering higher diagnostic sensitivity and safety. However, its adoption in a universal screening program is constrained by organizational barriers, such as the need for trained personnel, referral mechanisms, and high implementation costs. Policymakers should consider stratified screening focused on healthy newborns at risk as a cost-effective alternative. Phased implementation and pilot programs are

recommended to ensure scalability and feasibility, balancing clinical benefits with economic realities.

Ind-1835 Evaluating Extended Home-Visiting Programs with Advanced Econometric Methods: A Natural Experiment in Sweden

PRESENTER: **Sergio Flores**, Uppsala University

Background: In Sweden, Child Health Services (CHS) provide healthcare to all children under 18, focusing on preventive care and support for children under six through a tiered universal model. To address persistent health disparities among disadvantaged families, the government emphasized extended home-visiting programs in 2017, notably the Rinkeby model, which increased home visits from two to six and involved multidisciplinary teams. Despite investment exceeding 354 million SEK, implementation varied across regions with mixed outcomes. As these programs continue to receive government funding, there is a need to build local evidence. Our findings will inform policymaking and resource allocation.

Objective: To evaluate the effectiveness of an extended home-visiting program inspired by the Rinkeby model on child health and development outcomes among low socioeconomic status (SES) families in Sweden, using advanced difference-in-differences (DiD) econometric methods.

Methods: We conduct a natural experiment that exploits regional variations in the implementation of extended home-visiting programs between 2018 and 2020. The program involves six structured home visits by a multidisciplinary team - nurses, social workers, dental hygienists, and speech-language pathologists. Child Health Centers (CHCs) in low-SES areas are categorized into three groups:

1. **Full Treatment Group:** CHCs fully implementing the extended home-visiting program.
2. **Partial Treatment Group:** CHCs offering enhanced home-visiting services with varying intensity.
3. **General Group:** CHCs receiving resource enhancements without specific program mandates.

We utilize de-identified individual-level data from Swedish national administrative registers spanning 2012 to 2022, including demographic, socioeconomic, health, and healthcare utilization information. The study population includes all children aged 0–5 born in Sweden during this period and their parents, linked to their assigned CHCs via unique identifiers. A continuous treatment dosage variable represents the proportion of children within small geographic areas affiliated with CHCs participating in the full program. To enhance model precision and reduce confounding, we incorporate time-varying and fixed covariates—including socioeconomic status indicators (Care Need Index, household income), healthcare access variables, and demographic controls—into our advanced DiD estimators. We employ recent innovations in DiD methods suitable for staggered treatment adoption, using estimators from Sun and Abraham (2020), Callaway and Sant'Anna (2020), and Borusyak et al. (2021). These approaches adjust for group- and time-specific trends. Robustness checks include two-way fixed effects, placebo tests, and event study analyses to examine treatment effect dynamics over time.

Expected Results: Preliminary analyses suggest that the extended home-visiting program may positively impact child health outcomes among disadvantaged families. We expect to present findings on growth metrics, vaccination rates, breastfeeding prevalence, dental health status, injury diagnoses, healthcare utilization patterns, and family outcomes such as parental leave utilization. These results will inform policymakers about the program's effectiveness and guide future resource allocation.

Conclusion: The findings will directly inform a cost-benefit analysis of the program and guide policy decisions about scaling such interventions. Our results will also contribute to the broader evidence base for early childhood health services, offering relevant insights for other healthcare systems working to reduce health inequalities through targeted support within universal frameworks.

Ind-1977 Effectiveness and Cost-effectiveness of a Multifaceted Intervention to Reduce Infections and Improve Antibiotic use in European Nursing Homes.

PRESENTER: **Laura Vallejo-Torres**
AUTHORS: Beatriz G López-Valcárcel, Marina Elistratova, Anna García-Sangenís, Carl Llor

Background: The overuse and misuse of antibiotics (ATB), leading to antimicrobial resistance (AMR), is a critical issue among frail older adults in nursing homes, who are highly vulnerable to frequent and severe infections. Urinary tract infections (UTIs), some caused by resistant bacteria, are particularly common. These infections and their consequences could potentially be reduced through improved infection prevention and control (IPC) measures and enhanced antimicrobial stewardship (AMS). However, there has been a lack of substantial initiatives aimed at diminishing the prevalence of infections in nursing homes and reducing antibiotic inappropriateness. **Methods:** This three-year European project (IMAGINE, funded by the EU4H-2020-PJ2) aims to improve infection prevention—primarily UTIs—and reduce inappropriate antibiotic use for these infections through a multifaceted intervention targeting healthcare professionals in nursing homes across eight European countries (Denmark, Greece, Hungary, Lithuania, Poland, Slovenia, Slovakia, and Spain). The Audit Project Odense (APO) method is employed, involving pre- and post-intervention audit and feedback. The main part of the intervention involves a 2-day intervention program consisting of (1) presentation of the first audit results and discussion with peers; (2) AMR and IPC elements, with the participation of national experts; (3) discussion on AMS on how to improve the diagnosis of UTIs and the role of antibiotics for these infections; and (4) discussion of best practice case studies and practical issues. Patient- and facility-level indicators have been defined to assess changes in treatment appropriateness, infection reduction, and other outcomes. The effectiveness and cost-effectiveness of the interventions will be evaluated by comparing the pre- and post-intervention audit results and by estimating the cost of the interventions and potential saving associated with reduced infections and ATB-related adverse events and associated AMR. **Results:** In April 2024 the first audit was completed, involving 109 nursing homes (9,599 residents, 1,158 antibiotic prescriptions for UTIs). Overall, 12% of residents received ATB treatment for an UTI over the three-month registration period. This value varied from a 23% in Spain to 4% in Lithuania and Poland. The mean cost per ATB course was estimated in 15.4€, ranging from 4.5€ in Poland to 33.9€ in Denmark. In 49% of cases, ATB treatment for UTI was deemed potentially

unnecessary according to an algorithm developed by the project. The highest percentage of unnecessary ATBs was observed in Spain (58%), while the lowest value was seen in Greece (26%). During October and November 2024 interventions are being conducted in the nursing homes, and the second audit will take place during February to April 2025. Preliminary results on the effectiveness and cost-effectiveness of the interventions will be available in June 2025. **Conclusions:** Pre-intervention findings highlight substantial room for improvement in infection prevention and antibiotic use in European nursing homes. These results highlight the need for targeted interventions to address these critical issues.

Ind-2436 The Impact of Physician-Patient Gender Concordance on the Delivery of Medical Services in China

PRESENTER: **Shasha Yuan**
AUTHORS: Xiaojuan Sha, Kexin Xiao, Mingwei Fu

Abstract

Background The accumulating research has reported positive, neural, and negative effects of physician-patient gender concordance on health service delivery in different medical settings. However, evidence from low and middle income countries (LMIC) is scant. Our study aims to examine the effects of physician-patient gender concordance on quality of care and medical expenditure in the hospitalized acute myocardial infarctions (AMI) patients in China.

Methods This study uses personnel archive data and inpatient discharge claims data (2018- 2022) from a tertiary general hospital located in Eastern China. We focused on the patients with a primary discharge diagnosis of AMI to achieve the random matching between physicians and patients (n=1299). Multiple linear regression was used. The dependent variables were inpatient expenditure including total expenditure and specific fee categories and quality of care including treatment outcomes and readmission rate within 30 days of discharge, while key independent variable was the physician-patient gender concordance.

Results 70% of patients in the sample AMI patients were treated by surgeons of the same gender. The majority of male patients were operated on by male surgeons (69.0%), and only 1.00% of female patients were operated on by female surgeons. After controlling for confounding variables, the inpatient expenditure in the group of physician-patient gender concordance was statistically higher than those patients in gender dis-concordance group (coefficient=0.159, P<0.001), which is mainly shown in the medication and surgical expenditure, but not in diagnosis expenditure. Physician-patient gender concordance leads to an increase in the copayment rate by 4.37 percentage points (P<0.001), indicating that gender-concordant physicians do not use more reimbursable services when increasing the number of medical procedures, and may not consider cost-saving measures for patients. The gender concordance have an average of 0.07 higher treatment outcome scores, and 0.4 percentage point lower likelihood of being readmitted within 30 days of discharge. However, the latter is not statistically significant. The benchmark results are robust by two ways of robust examinations.

Conclusion

Our study revealed that gender concordance between physician and patient were related to the higher medical expenditure while it has no significant effects on quality of care for the hospitalized AMI patients in China. The findings could serve the basis of future studies to explore the underlying mechanisms regarding the difference resulted by physician-patient gender disparity during the delivery process of health care, which is important for the deep understanding of gender equity in health care.

Keywords: Patient–physician gender concordance; Acute myocardial infarction; Inpatient expenditure; Quality of medical care; China

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9:00 AM –10:30 AM WEDNESDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Bali

Measuring Complexity: Multimorbidity, Loneliness, and Cross-Cultural Challenges in Health Outcomes Research

MODERATOR: **Rebecca Prah**, London School of Hygiene and Tropical Medicine

Ind-2412 Assessing the Suitability of DALYs for Multimorbidities: Exploring Methods for Combining Disability Weights

PRESENTER: **Ewan Tomeny**, London School of Hygiene & Tropical Medicine (LSHTM)
AUTHORS: Firdaus Hafidz, Nateiya Yongolo, Felix Limbani, Phuong Bich Tran, Eve Worrall, Ben Morton

Background: Multimorbidity—the co-occurrence of multiple chronic diseases—is a growing public health challenge, particularly in low- and middle-income countries (LMICs), where Disability-Adjusted Life Years (DALYs) serve as a key metric for global health policy and resource allocation. DALYs quantify disease burden using condition-specific disability weights (DWs), but in multimorbid contexts, methods for combining DWs (e.g., additive, multiplicative) often yield divergent results, complicating burden estimations. These challenges are further amplified when addressing multimorbid states with three or more co-occurring conditions.

Aim: This study evaluates methodologies for combining disability weights to refine these approaches for improved applicability to multimorbid populations, particularly in LMICs. Specific objectives include:

1. Reviewing existing and theoretical approaches for combining DWs.
2. Examining differences in combined DW values across dyads, triads, and larger condition clusters under different methods.
3. Exploring the alignment of methodologies with patient-reported outcomes from the MULTILINK trial.

Methods: A systematic review (PubMed, Embase, Web of Science, WHO Global Health Library) identified methodologies for combining DWs, which were classified by mathematical formulation, including additive, multiplicative, non-linear dependencies, and interaction effects. Key properties (associativity, commutativity, monotonicity, boundedness, subadditivity) were tested to examine logical consistency and scalability for triads and higher-order clusters.

Hypothetical disease combinations were modelled using Global Burden of Disease (GBD) disability weights, with outputs visualised using three-dimensional heat maps (coloured surfaces) to illustrate variability across methods for common multimorbidity clusters. Real-world applicability was explored through validation using patient-reported health-related quality of life (HRQoL) outcomes from the MULTILINK trial in Malawi and Tanzania.

Results: The review identified five primary methods for combining DWs, with limited use of approaches beyond additive, simple multiplicative, and maximum-limit models. Eight distinct methodologies were modelled, revealing significant variation in combined DW values. Most methods did not satisfy all key desirable properties when applied to multimorbid states involving triads or larger condition clusters. Alternative models, such as diminishing returns and quadratic penalty approaches, offered more nuanced representations of cumulative burden but require further scrutiny. Early analyses suggest that nonlinear adjustments or penalties for overlapping impairments may align more closely with patient-reported HRQoL outcomes in the sub-Saharan African contexts studied.

Conclusion: Combining DWs for multimorbidities presents significant methodological challenges, raising questions about the accuracy of DALYs in reflecting health effects and their appropriateness for such analyses. Although all combination methods share limitations stemming from weak theoretical foundations, the alternative models tested demonstrate potential for more accurate representation of multimorbidity in DALY estimates beyond currently employed combination approaches. To ensure DALYs remain relevant for cost-effectiveness analyses of multimorbidity interventions, further empirical validation and foundational methodological development are needed. These efforts will enable more informed policymaking in LMICs, supporting better resource allocation and improved health outcomes.

Ind-978 Causal Association of Systolic Blood Pressure With Quality-Adjusted Life Years: a Mendelian Randomisation Study

PRESENTER: **Tamrat Befekadu Abebe**
AUTHORS: Jedidiah Morton, Jenni Ilomaki, Padraig Dixon, Zanfina Ademi

Background: Systolic blood pressure (SBP) is one of the main risk factors for cardiovascular disease. Studies have demonstrated the causal association of increased SBP with atherosclerotic cardiovascular disease. However, there is no robust evidence regarding the causal association between SBP and quality-adjusted life years (QALYs).

Aim: To estimate the causal association of SBP with QALYs.

Methods:

Methodological approach: Mendelian randomisation (MR) was used to estimate the causal effect of SBP on QALY. Genetic variants associated with SBP (181 single-nucleotide polymorphisms (SNPs)) were used as instrumental variables and identified from a genome-wide association study (GWAS). SBP was used as the exposure variable, and QALYs as the outcome variable.

Data source: The UK Biobank was used to source sociodemographic, clinical and genetic data. Our study included 502,151 participants, of whom 288,182 met the inclusion criteria. Participants were followed from the recruitment period (2006 – 2010) until October 31, 2022 or death, whichever came first. Health-related quality-of-life data were sourced from a previously published study.

Analytical techniques: The polygenic risk score (PRS) was constructed by summing the effects of the 181 SNPs on SBP, each weighted by its effect size derived from the GWAS meta-analysis.

Individual-level MR was performed using two-stage least squares regression (2SLS) to estimate the causal association of SBP with QALY. We regressed the exposure variable on the PRS for SBP at the first stage, followed by regressing the outcome variable on the predicted SBP from the first stage. Several sensitivity analyses were done, including inverse variance weighted regression (IVW), MR Egger, weighted median and weighted mode. The outcome of the study was presented as the annual percentage change in QALYs per 10 mmHg increase in SBP over the average year of follow-up.

Key results: The study followed participants for a median of 13.8 years (IQR: 13.1 to 14.4 years). The median age at baseline was 58.0 years (IQR: 50.0 to 63.0 years), with 53.3% (n=153,648) being female. Participants had a median SBP of 137 mmHg (IQR: 125 to 150 mmHg). The median QALYs per year was 0.76 (IQR: 0.53 to 0.89).

The 2SLS analysis demonstrated that for every 10 mmHg increase in SBP, the annual QALYs declined by 1.17% (95% CI -2.25% to -1.28%). Sensitivity analyses showed a consistent direction of effect. However, high heterogeneity (Cochran's Q = 430.3, p value <0.0001) in the genetic variant instruments was observed with I^2 = 58.2% (95% CI 50.7% to 64.5%). The MR Egger intercept showed little evidence of directional pleiotropy (MR Egger intercept -0.44% (95%CI: -0.97% to -0.09), p value 0.11).

Conclusion and implications for policy and practice: Increased SBP was observed to be associated with reduced QALYs. This finding

consolidates our previous knowledge on the effect of SBP on clinical cardiovascular outcomes. MR can be useful in health economics to estimate the impact of exposures on QALY with reduced confounding or reverse causation bias. The application of MR in health economics would facilitate the generation of unbiased evidence for decision makers.

Ind-1084 An Exploratory Study of the Appropriateness of the EQ-5D-5L and EQ-HWB for Loneliness Research

PRESENTER: **Ishani Kartik Majmudar**

Research Objectives: Loneliness, recognized as a global public health concern, severely impacts individuals' well-being and is associated with adverse health outcomes. Health-related quality of life (HRQoL), often quantified using Health State Utility Values (HSUVs), is crucial for evaluating the cost-effectiveness of interventions targeting loneliness. While generic measures like the EQ-5D(-3L/5L) are commonly used in economic evaluations, they may lack sensitivity to psycho-social aspects of loneliness. The recent development of the EQ Health and Well-Being Instrument (EQ-HWB) addresses this gap, incorporating explicitly an item on loneliness. However, head-to-head comparisons of different Multi-Attribute Utility Instruments (MAUIs) in capturing loneliness are lacking. The study aims to fill this gap by determining utility values associated with loneliness levels and assessing the performance of the EQ-5D and EQ-HWB, in capturing loneliness aspects. Methods: A secondary analysis was conducted using a nationally representative cross-sectional survey of Australian adults. The survey included the EQ-5D-5L, the experimental version of the EQ-HWB, and the 20-item revised UCLA Loneliness Scale (R-UCLA-LS), alongside sociodemographic and health-related characteristics. The study examined utility scores using the EQ-5D-5L and EQ-HWB-S, as well as the total score from the EQ-HWB, across three levels of loneliness (low/moderate/high). Significance tests were conducted using the Kruskal-Wallis test, with post-hoc analysis performed using Dunn's test. Exploratory factor analysis (EFA) was employed to explore the conceptual overlap of items from the EQ-5D-5L and EQ-HWB with the R-UCLA-LS item measure. Additionally, regression analysis was conducted to identify predictors of loneliness from the items that overlapped with the R-UCLA-LS. Results: A total of 2072 respondents completed the survey. EQ-5D-5L utility scores (Mean:0.81; SD: 0.18) were higher compared to EQ-HWB-S (Mean:0.75; SD: 0.23). Analysis revealed decrements in utility scores across loneliness levels for both EQ-5D-5L and EQ-HWB-S ($p<0.001$), particularly among respondents reporting moderate to high loneliness. In the EFA results, no items from the EQ-5D-5L overlapped with the R-UCLA-LS, which was contrary to the EQ-HWB where five items overlapped with the R-UCLA-LS (feeling lonely, feeling unsupported, feeling accepted, feeling good about myself, and able to do things), reflecting essential constructs of loneliness, perceived social isolation, and social support. Regression analysis emphasized the significant predictive value of specific EQ-HWB items, particularly those related to feelings of loneliness, being unsupported, and feeling good about oneself. Conclusion: The findings reveal a significant decline in utility values as loneliness levels escalate, emphasizing the substantial health burden associated with loneliness. While the EQ-5D-5L demonstrates moderate sensitivity to loneliness, the EQ-HWB-S and EQ-HWB exhibit stronger correlations with the R-UCLA-LS, suggesting their potential superiority in assessing loneliness-related constructs. Notably, the EQ-HWB-S emerges as a promising tool for loneliness interventions, owing to its sensitivity to loneliness and practicality in research settings.

9:00 AM –10:30 AM WEDNESDAY [Health Beyond The Health System]

Bali International Convention Centre – Executive Room 2

Preferences and Behaviour

MODERATOR: **Simon Combes**,

Ind-900 Effectiveness of Direct and Indirect Time Preference Elicitation Methods Across Domains in Predicting Health Behaviors: Evidence from Rural China

PRESENTER: **Danlei Chen**, Xi'an Jiaotong University

AUTHORS: Jingxian Wu, Qiqi Liu, Cong Li

Background: Health behaviors, which involve trade-offs between immediate costs and future benefits, are closely associated with individuals' time preferences. Despite this relationship, limited attention has been paid to identifying the most effective method for eliciting time preferences to predict health behaviors, particularly using large-scale representative survey data. This study aimed to compare the effectiveness of two time preference elicitation methods—direct (self-reported) and indirect (incentivized experimental) —across both health and financial domains in predicting health behaviors among a representative sample of rural adults in China. **Methods:** The data were collected through a household paper-and-pencil questionnaire survey conducted in six counties of Shaanxi Province, China, during July and August 2023. Using a multistage stratified random sampling method, the survey included 2,878 rural individuals aged 18 to 65 from 1,377 households. Time preferences were assessed in the health and financial domains using direct methods (self-rated long-term preferences and self-reported planning horizons) and indirect methods (exponential and hyperbolic discounting) with health and monetary outcomes. Health behaviors were classified as risky behaviors (smoking and excessive alcohol consumption) and protective behaviors (active exercise and routine self-funded physical examinations). Time preference indicators were standardized with means of 0 and standard deviations of 1 to ensure comparability. Both probit and ordinary least squares (OLS) regression models were used to assess the predictive power of these indicators on dichotomous and continuous measures of health behaviors, controlling for individuals' demographic characteristics, socioeconomic status, health status, and health behavior perceptions. **Results:** Time preference elicited using direct methods, particularly self-rated long-term preferences in the health domain, significantly predicted smoking (adjusted coefficient: probit = -0.0563 [*p* < 0.10], OLS= -0.2671 [*p* < 0.10]) and active exercise (adjusted coefficient: probit = 0.1129 [*p* < 0.01], OLS = 10.3206 [*p* < 0.05]). Additionally, self-reported planning horizons in health domain (adjusted coefficient: probit = 0.0593 [*p* < 0.05], OLS = 9.9300 [*p* < 0.05]) and self-rated long-term preferences in financial domain (adjusted coefficient: probit = 0.0597 [*p* < 0.05], OLS = 10.4109 [*p* < 0.05]) significantly predicted active exercise. Conversely, time preference indicators elicited by indirect methods demonstrated limited robustness in predicting health behaviors across both

domains. **Conclusion:** Direct methods for eliciting time preferences, particularly within the health domain, were more effective in predicting health behaviors, such as smoking and active exercise, compared to indirect methods. Moreover, health-domain-specific elicitation methods exhibited greater predictive power than those centered on the financial domain. These findings provide methodological insights for accurately capturing time preferences through surveys and inform the design of targeted public health intervention. We recommend integrating questions on individuals' self-rated long-term preferences, especially within the health domain, into household surveys to better understand time preferences associated with health behaviors, which allows for the development of targeted inventions aimed at modifying inter-temporal choices to encourage better health behaviors of more impatient individuals. (This study is funded by the National Natural Science Foundation of China (No. 72104196))

Ind-990 Peer Effects on COVID-19 Vaccine Uptake

PRESENTER: **Ao Liu**
AUTHOR: Yohei Mitani

This paper investigates the role of peer effects in vaccination behavior. We use a game-theoretic framework to causally identify peer effects on COVID-19 booster uptake among 1800 adults aged 20-79 years in Japan, based on a survey experiment on vaccination behavior. To tackle the challenges of identifying peer effects and the computational complexities associated with solving Nash equilibria and conducting simulations, we develop a Bayesian model and employ the No U-Turn Sampler (NUTS) for efficient parameter estimation. Our research focuses on three key questions: Do peer effects influence COVID-19 vaccination? How are equilibria selected? What roles do economic and social preferences play in vaccination behavior? Causal identification of peer effects is notoriously complex due to the interplay of multiple effects. Manski (1993) highlighted three types of effects: endogenous effects, where behaviors are influenced by peers' behaviors; contextual effects, driven by shared exogenous characteristics; and correlated effects, arising from unobserved common shocks. Literature often assumes the absence of contextual effects, correlated effects, or both. By leveraging a Bayesian approach, we avoid these restrictive assumptions, demonstrating that weakly informative priors can offer sufficient regularization to effectively identify these effects. Even in extreme cases where certain effects remain unidentified, marginalization techniques enable consistent estimation of the remaining effects. Additionally, we incorporate Bajari et al. (2010)'s equilibrium selection framework, empirically estimating equilibrium selection mechanisms within the Bayesian model. Our findings reveal that endogenous peer effects significantly impact COVID-19 booster uptake, while contextual and correlated effects do not. The estimated average marginal effect estimate indicates that a one-peer increment among five peers increases the individual's probability of booster uptake by 12.6 percentage points. Other significant determinants of booster uptake include age, education, subjective evaluation of health, and prosociality measured in an incentivized donation experiment. These results have two important policy implications. First, policymakers could harness peer effects as non-monetary incentives, as individual uptake positively influences peers' vaccination behaviors without requiring financial incentives. Second, peer effects can operate in both directions, potentially leading to suboptimal outcomes for groups of younger, less educated individuals, who may become trapped in a low-uptake equilibrium. Targeted mass vaccination campaigns for such groups could enhance overall vaccine coverage and mitigate disparities in uptake. **References** Manski, C. F. (1993). Identification of endogenous social effects: The reflection problem. *The review of economic studies, 60(3)*, 531-542. Bajari, P., Hong, H., & Ryan, S. P. (2010). Identification and estimation of a discrete game of complete information. *Econometrica, 78(5)*, 1529-1568.

Ind-1037 Accounting for Quality Variation in Cigarette Demand: Evidence from the Indonesian Family Life Survey

PRESENTER: **Susan Olivia**
AUTHORS: John Flood, John Gibson

Tobacco consumption kills around eight million people each year, with more than 200,000 of these in Indonesia. With two-thirds of adult males and 5% of females smoking, Indonesia faces severe health and economic burdens from tobacco use. Despite regular excise tax increases, the tobacco tax rate in Indonesia remains below the World Health Organization's recommended threshold of 75% of the retail price. Cigarette prices in Indonesia also remain among the lowest in the Asia-Pacific region. Consequently, estimating the effects of potential price increases on cigarette demand is critical for informing effective policy interventions. However, in common with most micro-econometric studies of cigarette demand, previous analyses on cigarette demand in Indonesia ignore quality variation, conflating quantity and quality adjustments in response to price increases. In general, consumers may respond to price rises by reducing the quantity consumed, but also by downgrading the quality of what they consume, with the latter response potentially undermining the effectiveness of tax policies. This issue is especially pertinent in Indonesia, where substantial price disparities exist across cigarette brands and types. In this paper, we use panel data from the Indonesian Family Life Survey (IFLS) to estimate individual demand for cigarettes. We model the quantity of cigarettes purchased and the quantity smoked, with demand depending on individual income, on a cigarette market price index formed for 320 communities, and on a vector of 25 other individual and household characteristics. Unlike previous analyses, our demand model also controls for 16 different cigarette brands (as a measure of quality choice). The longitudinal nature of the data also allows us to control for unobserved regional heterogeneity through cluster-level fixed effects. Our results show that the own price elasticity of demand for cigarettes purchased is -0.64 if quality controls are not used but just -0.40 when they are used. The brand-level effects show that people who usually purchase a cheaper type of cigarette smoke up to 40% more than those purchasing more expensive brands, conditional on prices and income. This overstatement suggests that studies of cigarette demand should use perceived quality attributes like brand. Otherwise, biased elasticities may inflate the expected reduction in cigarettes smoked after a tax-induced price increase. **JEL Codes**: D12, I10 Keywords: Cigarettes, Household Surveys, Quality, Price, Tobacco, Demand

Ind-1429 Using Technology and Behavioral Economics to Promote Development in the Early Years: The Effect of an over-the-Phone Program

PRESENTER: **Ana Balsa**
AUTHORS: Juanita Bloomfield, Alejandro Cid
Early childhood in developing countries faces a greater prevalence of risk factors and limited resources, underscoring the need for effective,

scalable support models. We develop and experimentally evaluate a multi-component approach to enhance family well-being over the phone. Our program combines scalable outreaches including calls by a teleoperator, messages, a chatbot, and an AI tool. Targeted at highly vulnerable families with children aged 0 to 3 years

in Uruguay, the intervention promotes positive parenting practices at home, fosters language development, and provides personalized assistance to help families access government benefits. The intervention was implemented with 1360 families eligible for support from the government agency Uruguay Crece Contigo over an eight-month period. We find that the program increases weekly frequency of parental engagement in stimulating activities, increases parental knowledge of language stimulation and reduces parental stress. Effects are in the order of 0.20 standard deviations. In addition, we find that the intervention significantly improves parents' linguistic interactions with their children in terms of higher average word rate of the mother and pitch range (by 0.37 standard deviations). Treated families made greater use of social benefits (by 0.30 standard deviations) including cash transfers and employment support programs. (JEL: J13, I10, I20, H43)

Ind-2761 Evaluating the Effectiveness of Financial Incentives in Promoting Influenza Vaccination Among Older Adults in China

PRESENTER: **Yuqian Lin**
AUTHORS: Fangli Geng, Yixuan Zhang, Omar Galarraga, Wangnan Cao, Refu Kaiti

Seasonal influenza imposes significant health and economic burdens globally, disproportionately affecting older adults. In China, influenza vaccination rates among individuals aged 60 and older remain alarmingly low, with uptake at just 4.16% in 2019–2023. Given the vulnerability of this population and the high associated morbidity and mortality, understanding effective strategies to increase vaccine uptake is critical. Financial incentives have shown promise in some contexts as a mechanism to improve vaccine coverage by reducing out-of-pocket costs and addressing behavioral barriers. However, limited research exists on the optimal design and impact of such incentives in low- and middle-income countries (LMICs) like China, where social determinants such as income, education, and health literacy heavily influence health behaviors. This study employed a discrete choice experiment (DCE) to evaluate preferences for financial incentives among older adults in China. A community-based survey was conducted in three diverse cities, incorporating urban and rural populations. The DCE presented participants with hypothetical vaccination scenarios featuring varying attributes: (1) subsidy amounts, (2) timing of vaccination, (3) number of co-vaccinees, and (4) form of compensation (cash, goods, or medical services). A total of 575 older adults completed the survey, and subgroup analyses were performed to assess variations in preferences by gender, income, education, health literacy, and living arrangements. Results highlight the critical role of subsidy magnitude, with higher subsidies significantly increasing vaccine uptake likelihood. Early timing of vaccination coupled with higher subsidies also demonstrated strong appeal, reflecting the urgency participants place on protecting their health during flu season. Preferences for compensation type varied: while cash incentives were broadly preferred, rural participants showed greater interest in goods or medical service vouchers. Subgroup analyses revealed significant differences: individuals with higher perceived disease risk or chronic conditions prioritized larger subsidies and earlier vaccination, while those with low vaccine literacy preferred simpler incentive structures. The study also revealed that participants often preferred to vaccinate alone rather than in groups, prioritizing convenience and reducing potential disruption to others' schedules. Interestingly, many were willing to forgo higher financial incentives to avoid the perceived inconvenience of coordinating vaccinations with others. These findings provide actionable insights for policymakers aiming to increase influenza vaccination rates among older adults in China. Financial incentives should be tailored to local needs, with a focus on addressing socioeconomic barriers and behavioral drivers. The study further suggests that integrating health education and targeted outreach into incentive programs could enhance their effectiveness and scalability. Our results contribute to the broader discourse on health-enhancing behaviors and interventions targeting vulnerable populations in LMICs, where systemic and cultural barriers to vaccination persist. By examining the interplay between financial incentives and social determinants of health, this study lays the groundwork for evidence-based policies that promote equitable access to preventive healthcare.

9:00 AM –10:30 AM WEDNESDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Jakarta B

Determinants of Access to Care for Non-Communicable and Mental Health Conditions

MODERATOR: **Olouyomi Scherif Adegnika**,

Ind-71 Modelling the Dynamics of Familial Hypercholesterolemia (FH) Screening and Treatment: Insights from Singapore's Emerging Genomic Testing Initiatives

PRESENTER: **Alexander Morton**
AUTHORS: Jamaica Roanne Briones, Hwee Lin Wee, Len Malczynski, Jing Lou, David Matchar

Background: Familial hypercholesterolemia (FH) is an inherited disorder characterized by high cholesterol levels, which can significantly increase the risk of cardiovascular disease if left untreated. In Singapore, an estimated 25,000 individuals have FH, though less than 10% have been diagnosed. Screening, early diagnosis, and timely intervention for FH through statin treatment can mitigate cardiovascular complications and prevent premature death. However, scaling up a nationwide FH screening program presents challenges, particularly around capacity constraints and resource allocation. This study presents a dynamic simulation model exploring strategies for screening, diagnosis, and long-term management of FH, informed by stakeholder engagement and capacity estimation.

Objective: This project aimed to develop a dynamic system model to simulate the supply-demand dynamics for FH screening and treatment in

Singapore. The objective was to identify optimal service strategies that balance the increasing demand for genetic testing with the limited capacity of healthcare providers, ensuring the program's sustainability while maximizing health outcomes.

Methods: The project leveraged a Group Model Building (GMB) approach, engaging a broad group of stakeholders including clinicians, administrators, and policymakers. The GMB sessions elicited key variables and decision points affecting FH screening, treatment capacity, and patient demand. These were integrated into a system dynamics model that reflects the complex interactions between patient referral flows, genetic screening capacity, clinical management workflows, and workforce constraints. The GMB session facilitated the development of a Causal Loop Diagram (CLD) that illustrates the feedback loops inherent in FH screening. Cascade testing, which identifies additional family members for screening, and the potential strain on primary and specialty care services were of particular concern. Capacity estimation exercises were carried out to assess the burden on both primary care providers and specialized lipid clinics. The resulting model can be used to simulate various scenarios to explore the implications of different triage strategies, workforce expansions, and potential bottlenecks in the healthcare system.

Expected Results: A concern is that while increased FH screening through genetic testing could identify more at-risk individuals, the healthcare system's current capacity would likely be overwhelmed without significant investment in both primary care and specialty services. Cascade testing in particular creates reinforcing feedback loops that could quickly escalate demand for genetic counseling and testing, further straining the system. Triaging patients based on low-density lipoprotein (LDL) levels and expanding the role of primary care providers in initial screenings could alleviate some of the pressure on specialty clinics, but additional strategies such as decentralized testing and increased genetic counselor training are crucial for program scalability.

Conclusion: This dynamic system model offers valuable insights into how FH screening and treatment programs can be optimized in the context of limited resources. The model highlights the importance of balancing screening demand with healthcare system capacity to avoid overburdening clinical services. Future research will further refine the model with additional real-world data and explore its application in other genetic conditions, making it a valuable tool for policymakers planning large-scale genomic testing initiatives.

Ind-156 Persistent Job Insecurity and Severe Mental Illness among Japanese Workers During the COVID-19 Pandemic

PRESENTER: **Narimasa Kumagai**, Seinan Gakuin University
AUTHOR: Aran Tajika

[Background] The COVID-19 pandemic reduced the standard of living of low-income households during the first two years and caused persistent job insecurity in the labor market. Prior studies have found that perceived job insecurity predicts adverse health outcomes, including worsening mental health.
[Purpose] The purpose of this study is to investigate whether job insecurity was caused by demand shocks and whether mental health deterioration persisted, taking into account the pathway from poor mental health to job insecurity.
[Methods] We used longitudinal data drawn from the Japan Household Panel Survey (JHPS) conducted by Keio University to measure the impact of job insecurity on the health of Japanese workers during the COVID-19 pandemic. Double robust estimation with inverse probability weighting was used to estimate the Average Treatment Effects on the Treated (ATET) for mental health status in the treatment group.
[Results] Low household income and experienced a layoff or bankruptcy each had a significant positive effect on job insecurity, regardless of the mental health in the past year was good or poor. Experiencing a layoff or bankruptcy had a positive impact on severe mental distress, however, was not a determinant of accumulated job insecurity. Income loss was associated with being employed in food & beverage or accommodation, transportation, construction, and manufacturing. Employed persons with debt under accumulated job insecurity were more likely to be in severe mental health condition than those with short-term job insecurity.
[Discussion] Comparing the determinants of accumulated job insecurity with that of short-term job insecurity, a greater impact of the mental distress in the past year was found in the long run. Regression analyses lacking the pathway from mental ill-health to job insecurity may overestimate the impact of income loss on job insecurity, and the impact of this pathway should be noted when considering health policies after demand shocks. In Japan during the sample period, economic policies toward the food & beverage or accommodation that suffered income losses may have been over-implemented.

Ind-740 "Reduction of Public Coverage did not Lead to Fewer Dental Visits": Fact or Fiction?

PRESENTER: **Ziade Sarroukh**
AUTHORS: Patrick Jeurissen, Stefan Listl

Background: Challenges of access have sparked political debates about dental coverage in the Netherlands. So far, policymakers have been opposing an expansion of public coverage for the adult population, arguing that previous reductions of public coverage would not have led to reduced dental attendance within the Dutch population. To this end, this study aims to evaluate the effects of public coverage reductions since 1995 on dental care utilization.

Methods: We used a population-wide dataset from Statistics Netherlands containing dental care utilization rates across insurance- and age-based subpopulations between 1981 and 2009. Drawing from an Interrupted Time Series (ITS) design with segmented regressions, the effects on dental attendance of scaling down public coverage for curative dentistry in 1995 and for preventive dentistry in 2004 were evaluated. Population groups which were not subject to the reforms (non-adult population, privately insured persons) served as control groups. Additionally, effects on the overall Dutch population were estimated through a single group ITS, controlling for economic performance indicators, including GDP per capita and household income, and cohort fixed effects.

Results: Following the 1995 reform and in comparison to privately insured persons (control group), dental attendance of publicly insured persons (intervention group) decreased by an immediate 3.5 %-points (95% CI -5.8; -1.1) and subsequently by 0.6 %-points (95% CI -0.9; -0.3)

per year. Compared to the non-adult population (control group), dental attendance by 20-40-year-olds (intervention group) immediately dropped by 4.6 %-points (95% CI -7.0; -2.1) and subsequently decreased by 1.2 %-points (95% CI -1.5; -0.8) per year. Changes following the 2004 reform were statistically insignificant. The single group ITS produced similar results. After adding cohort fixed effects, we find that dental attendance of the total Dutch population declined by 1.0 %-points (95% CI -1.8; -0.2) annually since the reform in 1995.

Conclusion: Contrary to Dutch policymakers' arguments, our findings suggest that reduced public coverage since 1995 led to fewer people visiting the dentist in the Netherlands. These findings highlight the central role of policy evaluation for evidence-informed oral health policymaking.

Ind-2444 Mining Masculinity: The Long-Term Effects of the Victorian Gold Rush on Men's Health-Seeking Behaviors

PRESENTER: **Gyeore Cha**
AUTHORS: Nicole Black, Johannes Kunz, Dennis Petrie

Objective: Resource extraction booms significantly reshape local demographics and social norms, often triggering large male-dominated migration. This study explores the long-term impact of the Victorian Gold Rush (1851-1899) on present-day mental health outcomes and healthcare utilisation. We hypothesize that masculine norms formed through intense male-male competition and demographic imbalances during the Gold Rush persist and discourage men's mental health and help-seeking behavior today.

Methods: This study employs a natural experimental design using geographic variation in historical gold mining occurrences in Victoria (1851–1899) to identify Gold Rush and non-Gold Rush areas. Adults aged 18-65 in these areas are compared using an intention-to-treat framework to assess long-term impacts on mental health outcomes and healthcare use. Historical mining data from GeoVic and demographic records from the Historical Census and Colonial Data Archive (HCCDA) are linked with individual-level administrative data from the Person Level Integrated Data Asset (PLIDA), including Medicare claims and mortality records.

Results: We find significant long-term implications of the Gold Rush on present-day mental health outcomes and mental healthcare use among men, but not among women. Men in Gold Rush regions experience, on average, 5.3 additional deaths of despair per 100,000 individuals compared to non-Gold Rush areas. However, men in Gold Rush regions have a 1.5 and 1.1 percentage point lower probability of obtaining a GP Mental Health Treatment Plan (MHTP) and visiting a psychologist, respectively. We link these results to previous studies on the formation of masculinity norms following historical shocks, showing that male-dominated environments and intense male-male competition can shape long-term patterns of behavior. Consistent with this, we find evidence of persistence dominant masculine norms in Gold Rush regions, as reflected in Victorian crime data showing higher rates of assault and sexual violence by 13.4% and 14.5%, respectively.

Conclusion: Our study demonstrates that persistent cultural barriers shaped by masculinity norms formed during intense historical male-male competition of the Victorian Gold Rush continue to influence men's mental health outcomes and mental healthcare engagement. These findings underscore how sociocultural factors shape help-seeking behaviors and highlight the need for culturally sensitive health policies and interventions tailored to men's mental health needs. Recognising and addressing these deep-rooted cultural norms is key to reducing barriers to care and improving health outcomes among men.

Ind-897 The Puzzle of Positive Drug Price Elasticity: The Role of Brand Preferences

PRESENTER: **Ran Li**
AUTHOR: Ms. Jianan Yang

The rapid rise in pharmaceutical expenditures has become a global policy challenge. While price reductions—achieved through insurance coverage, regulations, or procurement reforms—are widely believed to enhance affordability and patient welfare, these interventions may yield unexpected outcomes. For instance, price controls in India have inadvertently led to drug unavailability for vulnerable populations. Similarly, China's centralized drug procurement program, launched in 2019, has effectively lowered drug prices through competitive bidding but has paradoxically resulted in reduced utilization of chronic condition drugs among a subset of insured patients as we demonstrate in this study. We explore brand preference as a potential mechanism underlying this puzzling positive price elasticity and emphasizes the need to account for the complexity of patient preferences in policy design. China's centralized procurement program transitioned from decentralized purchasing to competitive bidding for molecules in nine provinces. Winning bidders—usually generic manufacturers—secured a guaranteed quantity at reduced prices, prompting pharmacies to prioritize prescribing these generics over branded versions. While bid-winning generics experienced substantial sales growth, analysis of 1.4 million patient records from over 300 Beijing community healthcare centers over two years reveals a surprising decline in actual purchases of price-reduced drugs among the patients with brand preferences. We define patients with brand preferences as those who exclusively purchased branded versions of specific drugs before the policy's implementation. Among pre-policy purchasers, 71.65% exhibited such preferences. Using a difference-in-differences framework, we find that patients with brand preferences significantly reduced their purchases post-policy, a shift large enough to counterbalance the anticipated utilization benefits from price reductions. This effect manifested across both extensive and intensive margins: fewer brand-preferring patients sought care post-policy, and furthermore, their visit frequency and purchase volumes per visit both declined. This pattern is in stark contrast to increased engagement and purchases by patients without brand preferences. Our findings contribute to the literature on group purchasing mechanisms and pharmaceutical policy by highlighting trade-offs between cost savings and choice distortion. Policies focused exclusively on price competition may overlook non-price attributes, such as brand loyalty, that influence patient behavior. Additionally, we shed light on the dual effects of generic drug entry on consumer welfare: while price reductions can boost affordability and access, they may simultaneously suppress utilization due to preference mismatches. These insights offer guidance for refining procurement designs, health insurance strategies, and patent policies to better balance affordability with patient-centered care.

Ind-1611 Exploring the Impact of Psychological Distress on Healthcare Utilisation: Evidence from an Australian Community Mental Health Study

PRESENTER: **Kiri Lay**, Flinders University
AUTHORS: Diana Khanna, Rachel Milte, Kate Fairweather, Jenny Cleland, Malcolm Battersby, Julie Ratcliffe

Background: Approximately 300,000 Australians with severe mental illness (SMI) face significant challenges in accessing and navigating healthcare services. Due to the complexity of their needs, further exacerbating the situation are disruptions in care caused by issues such as inefficient appointment scheduling, lengthy wait times for follow-up services, and inadequate community support systems or environments. These factors contribute to poor continuity of care, higher readmission rates, and frequent reliance on emergency services. Understanding the relationship between psychological distress and healthcare utilisation is critical for developing and refining interventions aimed at improving health outcomes in this vulnerable population.

Objective: This study examines trends in healthcare utilisation and associated costs in individuals categorised by Kessler Psychological Distress Scale (K10) scores.

Methods: A total of 120 individuals attending a community mental health service participated in an intervention which aimed to improve physical health through self-management strategies. Hospital administrative data were analysed for these participants, covering a follow-up period from baseline to 18 months. Participants were categorised into two groups based on their K10 scores: low to moderate distress (≤21) and high to very high distress (>21). Data on socio-demographic characteristics, health-related quality of life (HRQoL) using the SF6D, and healthcare utilisation were collected. Descriptive statistics were used to summarise healthcare utilisation and costs across groups, including emergency department (ED), extended emergency care unit (EECU), inpatient, and outpatient services. T-tests compared costs between the two K10 distress groups. Multilevel mixed-effects logistic regression models were employed to explore the likelihood of healthcare visits as a function of distress level, gender, intervention group assignment, and time.

Results: The overall sample had a mean age of 47 years, with 63% of participants being male. The average SF6D utility score was 0.64 (SD=0.1), with lower HRQoL in the High to Very High distress group (0.59) compared to the low to moderate group (0.68). Healthcare costs were significantly higher for individuals in the high to very high distress group ($17,181 vs $9,497; p-value=0.03), particularly for ED services ($3,344 vs $1,374; p-value=0.03). Mixed-effects logistic regression revealed that higher K10 scores were significantly associated with increased healthcare utilisation (p-value=0.017), while a non-linear interaction term suggested a diminishing effect at higher distress levels (p-value=0.017). Gender was also a significant predictor, with females more likely to utilise healthcare services than males (p-value=0.007). SF6D utilities and intervention assignment were not significant predictors of healthcare utilisation (p-value=0.866 and p-value=0.433, respectively). Temporal trends across the follow-up period showed no significant associations with healthcare utilisation (p-value>0.05).

Conclusions: This study highlights the influence of psychological distress and gender on healthcare utilisation, with higher distress levels and female gender associated with increased use of health services. Other factors, such as HRQoL and intervention assignment, demonstrated limited impact. The findings underscore the complexity of distress-related healthcare utilisation and the need for tailored interventions to address both physical and psychological health needs in individuals with SMI. Further research is necessary to explore the mechanisms underlying these associations and to evaluate the long-term efficacy of self-management interventions in this population.

Ind-1130 Narrowing Urban-Rural Disparities in Access to and Quality of Breast Cancer Care Under the National Health Insurance Program in Taiwan

PRESENTER: **Yiing-Jenq Chou**, National Yang Ming Chiao Tung University
AUTHOR: Nicole Huang

Background

Reducing rural-urban disparities in health care has been a compelling issue for decades. However, efforts in reducing urban-rural disparities may be offset by quality or payment policies such as regionalization or pay-for-performance (P4P), particularly for major morbidities such as cancer. Taiwan has implemented its National Health Insurance (NHI) program since 1995. Many people speculate that rural-urban disparities in access to care may no longer be an issue in Taiwan, a geographically small and densely populated country with a universal and comprehensive health insurance coverage. But is it true? The existing evidence in Taiwan is mostly limited to the data prior to 2010. Due to the changing morbidity patterns and technological development, it is essential to obtain an updated understanding of rural-urban disparities in Taiwan. Breast cancer serves as a good example to assess rural-urban disparities in cancer care since it is an increasingly prevalent cancer in Asia and there are well-established guidelines for breast cancer care.

Research Objectives

This study aimed to assess changes in rural-urban disparities in timely access to guideline-concordant care and patient outcomes among breast cancer patients in Taiwan over time and explore whether such disparities may be mediated through hospital characteristics.

Methods

The 2011-2016 Taiwan Cancer Registry and the 2010-2021 NHI data were used in this population-based retrospective cohort study. We identified 46,849 newly diagnosed breast cancer women with stage 1 to 3 from January 2011 to December 2016 and each patient was followed for 5 years. Timeliness in receipt of guideline-concordant treatments, recurrence and mortality were the main dependent variables. Urbanization status was categorized into two levels: remote and non-remote. Other control variables included patient characteristics (i.e. age, income, cancer stage, type of surgical treatment received) and provider characteristics (i.e. hospital level, hospital ownership, and P4P participation).

Multivariable logistic regression and Cox proportional hazard models were applied. Final models included interactions effects between urbanization level and time trend. Counterfactual event-based mediation analysis will be applied to examine potential mediation effects of hospital characteristics.

Preliminary Results:

Over the study period, the rate of delayed receipt of guideline-concordant radiotherapy from surgery decreased from 18.2% to 12.6% and five-year survival rate decreased from 9.2% to 8.4%, but the five-year recurrence rate increased from 7.6% to 9.9% over time. After adjusting for other factors, there was no significant difference in timely receipt of guideline-concordant care between people living in remote and non-remote areas. But patients living in remote areas had significantly higher hazards of 5-year recurrence (HR: 1.06) and 5-year mortality (HR: 1.30) than those living in non-remote areas. More importantly, the urban-rural gaps in 5-year recurrence and mortality hazards did not seem to narrow over time.

Conclusion

Under the NHI program in Taiwan, over time, no significant difference was observed in timeliness to guideline-concordant care between breast cancer patients living in remote and non-remote areas. But the urban-rural differences in 5-year recurrence and survival rates persisted over time. Factors other than timeliness to care such as quality of care may have contributed to the persisting gaps.

Ind-1355 The Impact of Dual Eligibility on Post-Acute Care Utilization Following Stroke

PRESENTER: **Mengyuan Cheng**
AUTHORS: Nasim Ferdows, Brady Post

Background Optimal stroke recovery relies on effective post-acute care (PAC), yet disparities persist, especially among Medicare-Medicaid dual-eligible beneficiaries. These individuals often experience greater medical complexity and financial barriers that shape their PAC choices. Medicare's 100-day skilled nursing facility (SNF) coverage limit, followed by Medicaid, creates financial incentives that may steer patients toward SNFs over inpatient rehabilitation facilities (IRFs), which generally provide better outcomes. Additionally, Centers for Medicare & Medicaid Services (CMS) eligibility criteria for IRFs can further limit access for dual-eligible patients. Understanding how dual eligibility influences PAC discharge decisions is crucial for guiding policy and optimizing healthcare resources.

Objectives To examine how dual eligibility influences discharge destinations after acute stroke care, focusing on IRFs, SNFs, and home healthcare (HH).

Methods We analyzed a nationally representative 5% sample of Medicare Standard Analytic Files linked to the Master Beneficiary Summary File for fee-for-service beneficiaries hospitalized with ischemic stroke in 2021, excluding in-hospital deaths and incomplete discharge data. Median household income and urban-rural classification were derived from publicly available datasets. The primary exposure was dual-eligibility status (full or partial Medicaid coverage at discharge). PAC discharge destinations included IRFs, SNFs, HH, and home without HH. We used propensity score matching (PSM) to balance sociodemographic (e.g., age, sex, race/ethnicity, income, and rurality), clinical (e.g., stroke severity, comorbidities, hospital length of stay), and state-level Medicaid policy factors. Matching was performed using the greedy nearest neighbor method (caliper width = 0.2; 5:1 ratio), and balance was assessed with standardized mean differences (SMD < 0.1). We then applied mixed-effects logistic regression to assess associations between dual eligibility and discharge destinations, accounting for county-level variations, stroke severity, length of stay, and their interaction. To further explore discharge patterns, we recoded the outcome variable as a multi-level categorical variable representing the four discharge destinations and fitted a multinomial logistic regression model with the propensity score-matched sample. Subgroup analyses, stratified by age, race, and stroke severity, were conducted to explore potential effect modification.

Results Prior to matching, dual-eligible patients (n = 1,438) were younger, more likely to be racial/ethnic minorities, and had higher medical complexity compared to Medicare-only patients (n = 7,506). Dual-eligible patients were less likely to be discharged to IRFs (adjusted odds ratio [aOR] = 0.49, 95% CI: 0.39–0.62) and more likely to SNFs (aOR = 2.26, 1.82–2.81) compared to Medicare-only beneficiaries. Discharges to HH were similar between groups (aOR = 1.15, 0.92–1.44). The multinomial regression model yielded consistent results. Patterns were largely stable across age and severity strata, except among younger patients (<65 years) and those with minor strokes, where differences were observed but not statistically significant.

Discussion Dual-eligible patients encounter systemic barriers to IRF access, likely due to CMS requirements and financial incentives favoring SNFs, leading to a potential mismatch between patient needs and PAC settings. This suboptimal allocation of resources may compromise recovery outcomes and healthcare spending efficiency. Future research should evaluate the cost-effectiveness of IRFs versus SNFs to inform policies that ensure equitable access to high-quality rehabilitation services.

Ind-1963 Sex Differences in Healthcare Utilisation - Evidence from Unexpected Adverse Health Shocks

PRESENTER: **Giovanni Mellace**
AUTHORS: Nadja van't Hoff, Seetha Menon

Background: The male-female health-survival paradox is a well-documented phenomenon wherein women, despite having a longer life expectancy than men, experience worse health outcomes. Previous research has highlighted gender disparities in healthcare utilization, driven by factors such as treatment access and biological differences. However, these studies often fail to establish causal relationships or quantify the magnitude of these differences. This study seeks to address this gap by examining how gender differences in healthcare utilization contribute to this paradox. **Research Question:** How do gender differences in healthcare utilization following adverse health shocks contribute to the male-

female health-survival paradox? What mechanisms drive these disparities, and to what extent can they be causally attributed to differences in treatment provision, patient behavior, or systemic factors? **Methodology:** This study applies a staggered difference-in-differences approach to examine how adverse health shocks—defined as non-fatal heart attacks or strokes—affect healthcare utilization by gender. Focusing on individuals in Denmark aged 50 to 70, the analysis compares those who experience a health shock at a given point in time (treatment group) with individuals who will experience the same type of health shock at a later point (control group). This comparison isolates the impact of the timing of the health shock while accounting for baseline similarities between groups. Importantly, this is the first study to estimate these effects separately for men and women, allowing us to uncover gender-specific differences in healthcare utilization. The method uses the estimator by Callaway and Sant'Anna (2021) to account for differences in treatment timing and includes controls for factors such as age and income. The outcomes analyzed include statin consumption, general practitioner visits, and hospital inpatient days. Using Denmark's detailed administrative healthcare data ensures high accuracy in measuring health events and utilization. Robustness checks include alternative specifications, matched samples, and validation of pre-treatment trends to confirm the reliability of the results. **Key Results:** Men consistently utilized more healthcare services than women across all measured outcomes following health shocks. For example, men's post-shock statin consumption was more than twice that of women. Similarly, men had significantly more visits to general practitioners and days hospitalized than women. These differences persisted even after accounting for baseline health conditions and other covariates. The findings challenge prior evidence suggesting greater primary care use by women and highlight potential disparities in treatment provision and uptake. **Implications:** The results reveal significant gender inequities in healthcare utilization, which may contribute to poorer health outcomes for women despite their longer life expectancy. These findings underscore the need for policy interventions that address structural and behavioral barriers to equitable healthcare access. Enhanced training for healthcare providers and targeted outreach programs could mitigate these disparities, improving health outcomes and advancing gender equity in healthcare systems.

9:00 AM –10:30 AM WEDNESDAY [Health Care Financing & Expenditures]

Bali International Convention Centre – Frangipani

Costing, Resource Use, and Efficiency

MODERATOR: **Souvik Banerjee**,

Ind-2829 Inequalities in Healthcare Spending in Brazil: Economic Impacts for Families By Geographic Region and Income Bracket

PRESENTER: **Ivan Augusto Cecilio e Silva**

AUTHORS: HARRISON FLORIANO DO NASCIMENTO, Alessandra Gaspar Sousa, MARIANA Marzullo M PEDREIRA, Gustavo Laine Araújo de Oliveira, Luis Eduardo Maciel dos Santos Ferreira, Ivanessa Thaiane do Nascimento Cavalcanti, Ana Carolina Esteves da Silva Pereira, Ms. Erika Aragao

Introduction: Inequalities in access to and spending on healthcare in Brazil reflect economic and regional disparities. In 2017, direct out-of-pocket (OOP) expenditure accounted for 4.0% of final consumption, exceeding the OECD average of 3.3%, indicating greater financial pressure on Brazilian families, especially those on low incomes and in vulnerable regions. Despite this, there is a lack of detailed analysis on the proportion of income allocated to essential expenses by income bracket and region. **Objective:** To** compare OOP expenditure on health between income brackets and Brazilian regions, assessing the proportional commitment of income to essential expenses. **Methodology:** A quantitative analysis was carried out using data from the latest Household Budget Survey (POF) of the Brazilian Institute of Geography and Statistics (IBGE) carried out in 2017-2018, with values adjusted for October 2024 based on inflation, considering the Broad National Consumer Price Index (IPCA), calculated by the IBGE. The dependent variables were OOP spending on health (absolute values and proportional to income), while the independent variables were the Brazilian regions and income brackets based on the current minimum wage (MW) of US$ 250.45 (low income: up to MW 2; intermediate strata: over MW 2 to 25; high income: over MW 25). To ensure the validity of the model, the tests of normality (Shapiro-Wilk), homogeneity of variances (Levene), and then two-way analysis of variance (ANOVA) were applied. Tukey's post-test was used to identify specific differences between the means of the groups. Spearman's correlation test was applied to assess associations between income and health expenses. The significance level was set at 5% ($p<0.05$), and statistical analyses were performed using SPSS software. **Results:** There were statistically significant differences in OOP expenditure between regions ($F=18.25$, $p<0.05$) and between income brackets ($F=24.47$, $p<0.05$). The Southeast and South had higher absolute spending averages than the North and Northeast ($p<0.05$), showing regional inequalities. Families in the Southeast and South spend an average of US$ 91.62 and US$ 72.34 per month, while those in the North and Northeast spend US$ 35.04 and US$ 52.10, respectively. Regarding income brackets, families with a higher monthly income spend more on health on average (US$ 382.55) than low-income families (US$ 21.70). However, low-income families allocate a significantly higher proportion of their monthly income to essential expenses, such as medicines ($F=15.78$, $p<0.05$), committing an average of 4.2%, compared to 1.4% for high-income families. The post-tests showed that families in the Northeast had the highest expenditure on medicines (monthly average of 3.2%), indicating an inverse correlation between income and proportional commitment ($r=-0.61$, $p<0.05$). **Conclusions:** The economic and regional inequalities in OOP expenditure in Brazil highlight the need for public policies that prioritize the most vulnerable regions and the lower-income classes, promoting greater equity in the health system.

Ind-760 Maternal Vaccine Delivery Costs: Prospective Cost Estimates from Five Low-and Middle-Income Countries

PRESENTER: **Ranju Baral**, PATH

AUTHORS: Iracema Barros, Md. Monjurul Islam, Patience Cofie, Rose Eddah Jalang'O, Kwame Amponsa- Achiano, Jessica Fleming, Patience Dapaah, Chris Fofie, Abhiyan Gautam

Background: The maternal vaccine landscape is expanding, including the anticipated global rollout of the now licensed respiratory syncytial virus (RSV) maternal vaccine. Integrating maternal immunization (MI) into health systems in low-and middle-income countries (LMICs) is likely to require adaptation to existing immunization delivery platforms and have cost implications. Understanding this cost is critical to inform introduction decisions and ensure financial sustainability of future MI interventions. In this study, we project the cost of maternal vaccine introduction and delivery across five LMICs (Kenya, Ghana, Bangladesh, Nepal, and Mozambique). **Methods:** We used a prospective, activity-based costing approach to project maternal vaccine introduction and delivery costs for a five-year period from a health system perspective. Country stakeholders informed the potential strategies for maternal vaccine delivery in each setting through stakeholder workshops in each country. Interviews with key immunization and maternal health program representatives informed anticipated health system adaptation requirements, activities, and resource needs to support maternal vaccine introduction and delivery. Supplementary data from a sample of sub-national health administrative units, vaccine stores, and health facilities were also used to inform the costing analysis. Financial and economic costs are estimated in 2023 USD. **Results:** New maternal vaccines are expected to leverage existing systems (e.g. maternal tetanus or the antenatal care platform) in all countries. The estimated incremental costs of MI delivery (excluding commodity costs) ranged between US$0.45 and $3.42 (financial) and $2.01 and $4.49 (economic) across study countries. Excluding commodity costs, health worker training, demand generation, and program planning/coordination were primary cost drivers across countries. Cost differences between countries are influenced by population sizes, anticipated baseline coverage and baseline health system capacity gaps. **Conclusions:** Very few studies exist on the costs of delivering maternal vaccine in LMICs. This study begins to fill this gap. Per our findings, economic cost of maternal vaccine delivery is expected to fall within the range of routine vaccine delivery costs, though additional, retrospective analysis post vaccine introduction would help to validate and strengthen these prospective findings. Estimates from these five countries can serve as proxies in settings where maternal vaccine delivery cost data do not yet exist. These estimates can also be used as inputs into cost-effectiveness and budget impact analyses to help inform decision making around introduction.

Ind-2327 Determinants and Trends in Domestic Public Spending on HIV in Low- and Middle-Income Countries, 2012 2024

PRESENTER: **Deepak Mattur**

Background: This study explores the trends and determinants of domestic public spending on HIV in low-and-middle-income countries (L&MICs) from 2012 to 2023. It is set against a backdrop of plateauing international aid and increasing emphasis on domestic resource mobilization as critical to sustaining HIV responses. The study comprises two components - analyzing the determinants of domestic public spending using an econometric model and leveraging the dependent variable from the econometric model (covering 108 LMICs) along with expenditure data reported directly to UNAIDS by major domestic spenders to develop trends in domestic public spending over the past ten years. **Key results: Determinants of Domestic Public Spending** Significant positive associations were found between Domestic Public Spending and covariates - Antiretroviral Treatment (ART) coverage (15+ years), HIV Prevalence, Civil Society Index, Societal enabling environment (SEE), and the GDP per capita. Other significant predictors include non-GDP residuals of the Human Development Index (HDI) (Table 1). The regression coefficient of unfavorable SEE is negative and significant, meaning that societal enabling environment is correlated with higher level of Domestic public spending on HIV. Domestic public spending in 2023 was estimated at US$ 9.5 billion. - The trends in Domestic Public spending from the regression model indicate that domestic resources are declining for the fourth consecutive year, a trend that began during the COVID-19 pandemic. (Figure 1) - Upper-middle-income countries have seen domestic investments stagnate or decline, while low-income countries experienced sharp declines post-2019, with recovery now nearing pre-COVID-19 levels.

Conclusions and implications for policy and practice: While domestic investments accounted for a significant share of HIV financing in 2023, the observed downward trend in domestic resources underscores the urgent need for strengthened domestic resource mobilization. The econometric analysis identified key determinants such as ART coverage, societal enabling environment, GDP per capita, and civil society engagement, emphasizing the interplay of health, socio-economic, and governance factors in shaping domestic HIV financing. Policymakers must address these challenges by strengthening domestic resource mobilization, fostering supportive societal env.ironments, and prioritizing investments in HIV programs. Sustained domestic commitment is vital to reversing the downward trend in funding and achieving global HIV targets

Ind-1193 Impact of Capitation Payment on Healthcare Service Behavior in County Medical Community: Evidence from Diabetes Patients in Rural China

PRESENTER: **Jiani Zhang**

AUTHORS: Ning Zhang, Jincao Yan, Yunke Shi, Xingxing Li

Objective Amid efforts to develop primary healthcare, China has been working to establish an integrated care system through the county medical community model, incorporating capitation payment to improve chronic disease management. This study investigates the impact of capitation payment reform on healthcare service behavior related to diabetes across tiered healthcare facilities with varying service roles. **Methods** Using County F, which implemented capitation payment reform within its medical community, as the sample area, we collected outpatient treatment records of diabetic visits from six townships that began the initial reform phase in April 2015 between January 2014 and December 2019. This dataset comprises 49,326 records from primary healthcare facilities and 1,628 records from the county hospitals, including medical costs, service items, and other details. We utilized interrupted time series analysis to assess the changes in healthcare service behavior before and after the implementation of the capitation payment model. **Results** Following the implementation of the capitation payment reform, both the average medical costs per visit and proportion of examination and testing costs showed a deceleration in growth in primary healthcare facilities (-0.615, $p < 0.05$; -1.554, $p < 0.01$, respectively). The proportion of medication costs, as well as the proportion of insulin or combination therapy and the average number of medications, exhibited a significant downward trend prior to the reform, while all showed an upward trend afterward. In county hospitals, the proportion of medication costs increased by 19.115% immediately post-reform, and both the level and slope of medication varieties significantly rose (2.041, $p < 0.01$; 0.244, $p < 0.01$, respectively). Although the proportion of

examination and testing costs exhibited an upward trend before the reform, both the instantaneous level and the trend declined after implementation (-19.684, $p < 0.05$; -1.833, $p < 0.05$, respectively). **Conclusion** In the sample area, the average medical costs for diabetic outpatients were effectively controlled following the implementation of the capitation payment reform, and the standardization of medication prescriptions by physicians in township health centers improved. County hospitals provided more comprehensive examination and testing services for diabetic visits, and the intensity of medication prescriptions was greater compared to the period prior to the reform.

Ind-1077 Implementing UHC-Benefit Package in Pakistan: From National Framework to Local Realities

PRESENTER: **Obaid Arshad Khan**
AUTHORS: Mr. Sven Engels, Matt Boxshall, Dr Shabana Haider, Jeewat Rai

Background: Universal Health Coverage (UHC) implementation in decentralized health systems presents significant governance and institutional challenges, particularly in low- and middle-income countries. While Pakistan developed a national essential package of health services (EPHS) based on Disease Control Priorities 3 (DCP3) in 2020, its decentralized structure necessitates provincial-level implementation. This research examines the pilot implementation of a rationalized UHC-Benefit Package (UHC-BP) in Tando Allah Yar district of under one million people, Sindh province, addressing the gap in translating national frameworks into local realities.

Research Questions: The study aims to address three key questions:

1. What are the financial gaps between required funds for the UHC-BP and current district health financing?
2. How does the rationalization process affect the overall cost and scope of the UHC-BP?
3. How can the pilot implementation address systemic health governance challenges in Sindh?

Methods: Our approach combines quantitative financial analysis with Aga Khan University's qualitative assessment of service delivery and governance structures. We conducted a comprehensive rapid assessment of healthcare facilities and finances, analysing public accounts, estimating service-based costs using DCP3 methodologies, and consulting a wide range of stakeholders including policymakers, health officials, and service providers. The rationalization process was iterative, based on intervention availability, fiscal space, allocative efficiency, and feasible delivery models.

Results: Key findings include:

1. The initial UHC-BP of 94 interventions at community, health centre, and first-level hospital levels cost $18.09 per capita – double the current district health budget.
2. Rationalization streamlined it to 62 interventions, costing $14.47 per capita, still exceeding current allocations but more aligned with fiscal realities.
3. The process revealed significant gaps in health governance, particularly in financial management, service delivery coordination, and data-driven decision-making.
4. Innovative solutions emerged, including a high-powered steering committee, dedicated project management unit, and plans for a district health account to improve financial transparency and accountability.

Conclusion: These findings have important implications for UHC implementation in decentralized systems. While ambitious national packages are crucial for setting standards, their implementation requires careful adaptation to local fiscal and institutional realities. The rationalization process, though reducing scope, was essential for creating a feasible starting point for UHC implementation.

The pilot offers valuable lessons, underscoring the importance of:

1. Adaptive planning and iterative design in health policy implementation
2. Strong stakeholder engagement to ensure buy-in and address implementation challenges
3. Robust district-level health financing data and analysis
4. Digital health information systems for enhanced governance and service delivery

Future policy should focus on strengthening district-level capacity for health system management, improving health information systems, and enhancing resource allocation efficiency. Ongoing monitoring and evaluation will be crucial to assess the project's impact on health outcomes, financial protection, and healthcare equity.

This research contributes significantly to knowledge on pragmatic UHC implementation in resource-constrained settings. It provides a detailed roadmap for translating national policies into actionable local interventions, offering valuable insights that can inform health system strengthening efforts across similar contexts globally.

Ind-1513 The Timely Availability and Prices of Patented Medicines How Does Canada Fare Given its Price Regulations? An Analysis of 34 OECD member countries.

PRESENTER: **Wei Zhang**, University of British Columbia
AUTHORS: Nathaniel Dyrkton, Daphne Guh, Alexander Tam, Aslam Anis

Background: Canada had the second highest level of prescription drug prices in the world, after the United States (US), in 2022. Attempts to redress this situation by reforming the Patented Medicine Prices Review Board's (PMPRB's) price regulatory policies have met severe resistance from Big Pharma including court challenges and the ultimate threat by Pharma of *not launching* new drugs in Canada if the reforms are enacted. However, previous research has shown that the proposed price regulation has had little impact on the launch of new patented

medicines in Canada and that the new price regulation might or might not lower the drug list prices in Canada depending on the approaches that will be used in the PMPRB's final guidelines.

Objective: To examine both patented medicine prices and launches across the OECD to better elucidate how Canada fares compared to other countries.

Methods: IQVIA MIDAS Sales quarterly data from 2012-2023 were used. We selected molecules that were defined in the database as new active substances and innovative branded products launched after 2012. The launch date for each molecule for a given country was determined by its first local sale date and the global first launch date was the first sale date across 34 countries. The 2-year launch proportion for each country was the number of country-specific molecule-launches divided by the total global launches. Prices of all existing patented medicines in the database as of 2023 were examined at market level (i.e., the molecule, form/route of administration and strength level) using ex-manufacturer price ratios between a foreign country and Canada in 2023, weighted according to Canadian sales volume patterns. We summarized the two outcomes by country.

Results: There were 438 new molecules launched by Q4 2021 that were included in the launch proportion analysis. Out of the 34 countries, three countries launched a majority of these new molecules within 2 years of the global launch date: US (76%), Germany (55%), and the United Kingdom (UK) (51%). Canada launched 38% (9th highest proportion). In 2023, there were 1,784 markets in Canada that were included in the price ratio calculations. Bilateral foreign-to-Canadian price ratios showed US (4.35) and Mexico (1.28) had prices higher than Canada. That is, Canadians would have paid less for patented medicines in 2023 had they paid the prices from 31 other countries. Seven countries had launch proportions that were greater than Canada, yet price ratios were below 1: Italy (0.87), Germany (0.84), Austria (0.82), the UK (0.78), Sweden (0.72), Norway (0.69), and Japan (0.63).

Conclusion: This descriptive analysis of sales data suggests Canada had timely access to a moderate share of the patented medicines launched globally. However, Canadian prices remained among the highest across the OECD countries considered. Furthermore, several countries with launch proportions greater than Canada had lower prices. Further analyses will be conducted to examine the speed and cumulative probability of launching as well as the change in drug prices over time in OECD countries.

Ind-1372 Linking Drugs to Diagnoses Using Pharmaceutical Claims Data: A Method and Its Application Measuring Off-Label Prescribing

PRESENTER: **Maitreyi Sahu**, University of Washington
AUTHORS: Max Weil, Joseph Dieleman

BACKGROUND

Spending on prescribed pharmaceuticals accounted for 9% ($405.9 billion) of US healthcare spending in 2022. Off-label prescribing, meaning prescribing for uses other than what was approved by the US Food and Drug Administration, is common practice in the US and can be reimbursed by insurers. Prior research from 2001 suggests that up to 20% of commercial prescription drug claims are off-label. In this study, we develop a model to link pharmaceutical claims to the health condition for which they are prescribed, allowing us to estimate utilization and spending on off-label prescriptions by drug, health condition, and time in a commercial health insurance database for 2010 to 2018.

METHODS

For 742 commonly prescribed drugs, we estimate the fraction of retail pharmaceutical utilization and spending that is off-label in the Market Scan commercial health insurance claims data for 2010 to 2018. Because claims data contain National Drug Codes (NDCs) identifying pharmaceuticals but not the diagnoses for which they are prescribed, we probabilistically assigned health conditions to drugs in a multi-step process: (1) we linked prescription drug claims to the most recent outpatient visit occurring up to 30 days before the pharmaceutical claim, (2) we mapped diagnoses (defined by ICD-9 / ICD-10 codes) in the outpatient visit to 148 defined health conditions, (3) we restricted data to on- and off-label uses from the Thomson Micromedex pharmaceutical compendium, which we also manually mapped to our 148 conditions, and (4) we a random forest model to predict on- and off-label uses given the generic drug name, for 8 age/sex groups and leveraging drug details including dosage, package size, and route of administration. This generated a dataset of pharmaceutical spending and utilization by health condition, in which we estimated on- and off-label utilization and spending among adults over age 20. All values are reported in 2019 USD.

RESULTS

In the Market Scan commercial health insurance claims for 2010 to 2018, 742 commonly prescribed drugs accounted for an annual average of $1.38 billion total spending and 10.3 million claims. Among adults from 2010-2018, off-label prescribing accounted for 16.2% of pharmaceutical claims and 8.5% of total spending in the Market Scan claims data. While the proportion of off-label prescriptions remained stable at approximately 16% from 2010-2018, off-label spending decreased from 11.9% in 2010 to 6.1% in 2018. Across 2010-2018, health condition categories with the most off-label spending were anxiety and depressive disorders ($122.0 million), musculoskeletal disorders ($90.2 million), and respiratory conditions ($85.0 million). There was proportionally greater off-label drug use in Medicare Advantage (age ≥65) than in other private claims. Ongoing work examines off-label utilization and spending by drug, and extends this analysis to 2022.

CONCLUSIONS

Off-label prescribing accounts for a substantial proportion of retail pharmaceutical utilization and spending. From 2010-2018, spending on off-label prescriptions appears to be decreasing, while utilization has remained stable. Future work should examine the strength of evidence behind this off-label use in order to better understand its impact on quality of care.

Ind-2764 Did Intra-Province Reimbursement Reduce Patient-Requested Premature Discharge? An Impact Analysis on the Health Care Reimbursement Reform in China

PRESENTER: **Di Yang**

AUTHOR: Elias Mossialos

Background: China's health care system has been suffering from fragmentation since its restructuring in the 1980s. In addition to the varied social health insurance (SHI) programs for different segments of the population, China's health care system was geographically fragmented, and the SHI was financed and administered at the municipal level. Before the 2014 reform, patients were only able only use their SHI in the municipality of registration. Outside of the municipality of registration, SHI was essentially void, and patients would have to pay 100% out-of-pocket. Since 2014, China has implemented a series of reforms that allowed patients to receive SHI reimbursements for medical services obtained outside their municipality of SHI registration. While previous studies showed that the reform reduced catastrophic health expenditure and improved financial protection, its impact on care rationing, such as self-discharge against medical advice, remains unclear. Reduced care rationing serves as a key indicator of financial protection and a critical measure of the reform's success.

Methods: We used a Difference-in-Differences model to investigate the impact of 2014 intra-province SHI reimbursement reform on self-discharge against medical advice (defined as a patient-initiated termination of inpatient care without recovery or a physician's recommendation for discharge). We analyzed inpatient admission episodes at local hospitals from the China Health and Retirement Longitudinal Study (CHARLS 2011, 2013, and 2015). The control group comprised individuals with local SHI registration, who had continuous access to SHI-covered services at local hospitals. The treatment group included individuals with non-local SHI registration (such as internal migrants), who could only receive SHI reimbursement for inpatient care at local hospitals after the reform. We used the same Difference-in-Differences model specification for two OLS regressions. In the first regression, the outcome variable was whether the patient requested discharge against medical advice. In the second regression, the outcome variable was whether financial concern was the main reason for self-discharge.

Key findings: The likelihood of self-discharge against medical advice did not change significantly after the 2014 reform. However, individuals with non-local SHI were less likely to report financial concern as the main reason for self-discharge against medical advice. After the reform, the likelihood of reporting financial reasons for self-discharge against medical advice declined by 28 percentage points. As a robustness check, we used the same Difference-in-Differences model specification but with Logistic regressions, and the findings were consistent.

Conclusions and implications: The 2014 reform improved the financial protection of SHI but was not sufficient to reduce self-discharge against medical advice. Other factors, such as inpatient care quality and lack of long-term care facilities, would also contribute to self-discharge against medical advice. SHI reform must be complemented by supply-side reforms aimed at improving hospital care quality, as high-quality, high-tier hospitals are disproportionately concentrated in provincial capitals and major cities in China.

9:00 AM –10:30 AM WEDNESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Denpasar B

Cardiovascular Disease: Prevention to Rehabilitation

MODERATOR: **Jemimah Ride**, Monash University

Ind-163 Advancing Global Prevention Practices: Cost-Effectiveness of Immediate vs. 5-Year Risk Cardiovascular Strategies

PRESENTER: **Zanfina Ademi**, Monash University

AUTHOR: Jedidiah Morton

Objectives: Current Australian and global CVD prevention guidelines utilise a 5-year risk assessment, potentially overlooking individuals with low short-term but high long-term CVD risk. This study evaluates the cost-effectiveness of initiating intervention for risk factor control at age 40 years, regardless of calculated risk, compared to the conventional strategy recommended by guidelines, thereby advancing HTA to meet broader, global health demands.

Methods: We employed a causal-microsimulation model containing 108 varied risk factor profiles from the UK Biobank, each replicated 10,000 times, to project outcomes from age 40 to 85. The model evaluated the effects of early LDL-cholesterol and blood pressure management versus beginning treatment at the conventional 10% 5-year CVD risk threshold. The main side-effect in the model was an increased type 2 diabetes risk due to statin use. This trade-off was quantified in quality-adjusted life years (QALYs). Incremental cost-effectiveness ratios (ICERs) were compared to Australia's AU$28,000 per QALY willingness-to-pay threshold, with financial outcomes adjusted annually at a 3% discount rate.

Results: Early intervention was effective in preventing CVD across almost all risk profiles, resulting in increased QALYs and life expectancy for a significant portion of the population (37/54 females and 44/54 males in QALYs; 46/54 females and 47/54 males in life expectancy). Moreover, it was cost-effective in various cases (5/54 females and 17/54 males). Notably, immediate intervention showed a favourable cost-effectiveness ratio in individuals who exhibit moderate long-term risk that may not be captured by short-term assessments.

Conclusions: This study highlights the urgency of reevaluating CVD prevention strategies within HTA, demonstrating that broader, more inclusive preventive interventions are not only effective but cost-effective as well. It signals the need for a significant shift to prioritise CVD, the top cause of global morbidity and mortality.

Ind-1755 Optimizing Screening for Cardiovascular Disease Risk: Distributional Cost-Effectiveness Analysis With Stochastic Dominance

PRESENTER: **Nilmini Wijemunige**, Institute for Health Policy
AUTHORS: Pieter van Baal, Owen O'Donnell, Ravindra Rannan-Eliya

Objectives Screening for cardiovascular disease (CVD) risk is potentially cost-effective but its distributional impact by economic status likely depends on who is screened, how and with what criteria to prescribe preventive treatment. We conducted a distributional cost-effectiveness analysis to identify the CVD screening strategy for Sri Lanka with the best equity-efficiency trade-off. **Methods** Using nationally representative data on 4,745 adults, we modelled four strategies of opportunistic CVD risk screening at public outpatient clinics and the current screening program at designated clinics. We measured economic status (ES) with an assets index. For each strategy, we simulated the costs and quality-adjusted life years (QALYs), as well as the distribution of QALYs net of health opportunity costs by ES. We used stochastic dominance analysis to compare the QALY distribution of each screening strategy across ES percentiles. We also calculated inequality-penalized QALYs using a social welfare function analogous to the extended Gini family, and compared results with those from the stochastic dominance analysis. We used scenario analysis to assess the impact of different distributions of opportunity costs over the ES gradient, as well as probabilistic sensitivity analysis to test the sensitivity of the modelling to variations in the input parameters. **Results** Compared with the current program, more total QALYs were generated by opportunistic screening a) at a higher age threshold (≥ 40 vs ≥ 35), b) with statins prescribed at a lower CVD risk threshold ($\geq 10\%$ vs 20%), c) with antihypertensives prescribed at a lower blood pressure threshold (130/80 vs 140/90) to people with diabetes or at high CVD risk and d) with statins prescribed to all people with diabetes. The strategy which included the features (a)–(c), without (d), generated the highest QALYs net of health opportunity costs across ES percentiles, and dominated the other strategies. The findings were consistent with the inequality-penalized QALY analysis, where the same strategies were preferred with some degree of aversion to inequality. The results were highly sensitive to the distribution of opportunity costs over the ES gradient. # **Conclusions** Stochastic dominance analysis shows that several CVD risk screening modifications would improve health across the ES distribution but the optimal strategy was sensitive to the assumed health opportunity cost. This is one of the first times stochastic dominance analysis has been applied to analyze the distributional impact of strategies in an LMIC. This method avoids the need to specify a degree of aversion, unlike approaches that calculate inequality-adjusted QALYs, and we demonstrate that stochastic dominance analysis is a valid, non-parametric approach for comparing health distributions based on general ethical principles.

Ind-452 Cost-Effectiveness of Prehospital Extracorporeal Membrane Oxygenation in Out-of-Hospital Cardiac Arrest in Sydney Australia: PRECARE Trial Insights

PRESENTER: **Fredrick Zmudzki**, Royal Prince Alfred Hospital
AUTHORS: Mark Dennis, Paul Forrest, Emily Moylan, Hergen Buscher, Brian Burns, Changle Song, Timothy Southwood, Natalie Kruit, Hemal Vachharajani

Background: The use of extracorporeal membrane oxygenation (ECMO) in refractory cardiac arrest, termed ECMO-CPR (ECPR) has increased significantly. ECPR has demonstrated survival rates of around 30% when strict eligibility criteria are applied, for patients highly unlikely to survive without ECMO support. Prehospital ECPR (PH-ECPR) for out-of-hospital cardiac arrest (OHCA) may improve both equity of access and outcomes in this patient population by expanding service reach by up to four-fold. Cost effectiveness reflects positive survival rates, excellent neurological outcomes, and efficient use of short-duration, high-cost ECMO; resulting from characteristic ECPR survival curves where patients either do not survive or are quickly weaned off support. This study examines whether PH-ECPR is cost-effective in OHCA patients.

Methods: Using data from the current New South Wales Ambulance PH-ECPR PRECARE trial, NSW Ambulance Cardiac Arrest Registry (CAR), geospatial and time modelling, and in-hospital care pathways, a cost analysis of PH-ECPR was performed. All strategies are based on a PH-ECPR clinical team of 2 senior doctors, 1 paramedic and 1 OHCA dispatcher. The estimated cost per PH-ECPR patient combines all responses including turn backs where ECMO was not required due to return of spontaneous circulation (ROSC), or not indicated due to exclusion criteria. Immediate PH-ECPR team activation is crucial, prioritising sensitivity over specificity to ensure arrival early in the arrest phase; resulting in unavoidable turn backs potentially as high as 10:1. A Markov model combined the PH-ECPR cost analysis with reported patient outcomes across multiple mobile service strategies using innovative methods including; estimated survival probabilities weighted by ECPR eligible population to establish optimal pre hospital team location; bridging formulae from PH-ECPR survivor cerebral performance category (CPC) scores to estimate Quality Adjusted Life Years (QALYs), Incremental Cost Effectiveness Ratios (ICERs) and cost effectiveness acceptability curves (CEACs); and ECPR comparison based on low flow rates as the escalation point where conventional CPR survival probability approaches zero. Probabilistic sensitivity analysis (PSA) assessed the joint uncertainty in all model parameters.

Results: Assuming 100 PH-ECPR patients per year, the average cost per patient was $50,964, equating to an average pre-hospital cost of $12,741 assuming a conservative 25% team allocation to ECPR; and a total cost per patient of $88,656 AUD, a base case of around $44,000 per QALY. Assuming a lower 20% survival equates to $62,000 per QALY and an increased survival scenario of 40% indicates approximately $30,000 per QALY. Addition of a conservative 10% of patients' kidney organ donation from non survivors reduces the base case cost per QALY to $22,000. Survival rate and integration of the team in performing other non-ECPR clinical tasks are key aspects contributing to cost-effectiveness.

Conclusion: Building on prior research showing ECPR in carefully selected patients can efficiently utilise high cost ECMO support, the initial PH-ECPR cost analysis and modelling indicate that PH-ECPR service strategies in Sydney are likely to be cost-effective; and increase equity of access through earlier intervention to an increased OHCA population. Additional positive outcomes based on potential organ donation may further contribute to PH-ECPR cost effectiveness.

Ind-2224 A Cost-Utility Analysis of Surgical and Transcatheter Pulmonary Valve Replacement with Right Ventricular Outflow Tract Remodelling in Indonesia

PRESENTER: **Andi Nurul Annisa**
AUTHORS: Puree Anantachoti, Osot Nerapusee, Dafsah Arifa Juzar, Radityo Prakoso

Backgrounds Transcatheter Pulmonary Valve Replacement (TPVR) is better and safer than Surgical Pulmonary Valve Replacement (SPVR) for patients in right ventricular outflow tract (RVOT) who have had prior surgery. However, TPVR's price is extremely high and not covered by the current universal schemes in Indonesia. Therefore, an economic modelling approach was utilized to perform a cost-utility analysis between SPVR and TPVR. The study had two primary objectives. Firstly, to assess the cost-effectiveness of TPVR as compared to SPVR for patients with a history RVOT replacement. Secondly, this study aims to estimate an optimal price for TPVR under Indonesia's National Health Security Programme (known as Jaminan Kesehatan Nasional or JKN), by analysing threshold variations in the price of the TPVR system. **Methods** A Markov model was employed to calculate the costs over a lifetime, total quality-adjusted-life-years (QALYs) and total life-years (LYs) for a hypothetical cohort of patients with RVOT, along with total incremental cost-effective ratios (ICERs). This economic modelling considered SPVR or TPVR for patients with clinical anatomy disease. The model began with paediatric patients at 15 years of age with prior surgery (SPVR0) between the ages of 2-4 years. Patients then underwent 1st and 2nd repeated SPVR at 15-year intervals. Alternatively, patients started with an initial TPVR, followed by 1st and 2nd repeated TPVR within 10 years of intervals. The costs related to SPVR and TPVR procedures and complications were considered. After 45 years of age, all patients who underwent SPVR and TPVR had a higher mortality risk up to 10 times compared to natural death. The methodology was based on the Indonesian HTA Guideline, while clinical and cost input parameters were derived from two meta-analyses, the hospital's website, and published resources with slight modifications. The outcomes of interest were annually discounted to 3%. All prices were adjusted with the consumer price index (CPI) and expressed in 2023 USD. Deterministic and probabilistic sensitivity analyses (DSA and PSA) were conducted to validate the results. **Results** The analysis revealed that the incremental cost, QALYs, and LYs were 47,087.13 USD, 2.45, and 3.38, respectively. The threshold for cost-effectiveness was set at one-time GDP, which in Indonesia is 3900 USD. Based on this, TPVR did not prove to be a cost-effective intervention, with an ICER over a lifetime of 19,191.37 USD/QALY. Further analysis using DSA indicated that the initial TPVR utility value played a critical role in the ICER. ICER scatter plots in PSA analysis revealed that TPVR was more effective but also more expensive than SPVR. However, to be more accessible, the price of the TPVR system should be reduced by 70% of its current cost, to 10,000 USD. **Conclusions** TPVR is not cost-effective in Indonesia's real-world setting due to the high pricing of TPVR's system. This result may serve as crucial evidence for health policy makers to reach an optimal TPVR provision price while transitioning towards universal health coverage (UHC).

Ind-2560 Increasing Participation in Cardiac Rehabilitation in the United States: Cost Effectiveness of Case Management and Financial Incentives

PRESENTER: **Donald S. Shepard**
AUTHORS: Diann E. Gaalema, Philip A. Ades, Robin K. Collier, Patrick D. Savage, Jiaye Shen, Deborah E. Denkmann, Bryan R. Katz, Blair Yant

Purpose. Cardiac rehabilitation (CR) is a program of monitored exercise and instruction on diet and lifestyle for patients with heart disease. As CR is highly effective, cost-effective, and professionally recommended, policymakers seek to increase utilization. Here we applied results from a four-arm randomized trial of case management (CM) and financial incentives (FI, paid as retail gift cards), delivered separately and combined. We modeled their impact and cost-effectiveness compared to usual care (UC) in increasing quality-adjusted life years (QALYs).

Methods. The trial randomized 192 participants, all of lower socio-economic status.** Staff time logs, FI payouts and CR attendance records generated short-term data on each participant's costs and number of CR sessions. We derived the lifetime QALYs and cost-effectiveness from a 2024 cost-effectiveness study of CR calibrated from an observational cohort of 601,099 CR-eligible Medicare beneficiaries. That cohort study controlled for confounding using instrumental variables (IV) and propensity-based (PB) matching.

Results. Usual care averaged only (with 95% confidence intervals) 10.94 (6.07-15.81) CR sessions, far below the 36 sessions constituting complete CR. FI alone and CM+FI combined increased CR sessions significantly. Additional CR sessions per participant averaged 7.04 (0.93-13.15) with FI and 13.63 (7.86-19.41) with CM+FI. CM alone did not increase sessions significantly (mean 1.66, -4.23-7.56). CM+FI generated the most lifetime QALYs—0.733 (IV) and 1.100 (PB) and displayed a powerful synergy between CM and FI. Under CM+FI, financial payouts averaged $697 (range $0-$1,260) and total intervention costs averaged $2,388. The lifetime cost-effectiveness of CM+FI was 29.996 (29.636-30.296, IV) or 29.257 (28.935-29.579 PB) QALYs/$million. Both values substantially surpassed the average cost-effectiveness of the US healthcare system (10.421 QALYs/$million), published by Andres Pichon Riviere and colleagues in 2023.

Conclusions. CM+FI proved highly effective and more than twice as cost effective as the average of all health interventions in the US. The synergy appeared due to the ability of CM to show participants how to overcome barriers to CR participation and of FI to increase participants' motivation to try harder. CM+FI, combined with other effective interventions, such as automatic referral and home-based CR, merit widespread implementation and funding. The combination of coaching and incentives could likely also help control other non-communicable diseases.

Bali International Convention Centre – Nusa Dua

Preferences for Health and Healthcare

MODERATOR: **Anne Spencer**,

Ind-187 Patient Preferences for Definitive Management of Oesophageal Cancer: a Discrete Choice Experiment.

PRESENTER: **Josipa Petric**
AUTHORS: Norma Bulamu, Gang Chen, Tim Bright, David Watson

Background: Oesophageal cancer (OC) is the eighth most common cancer and sixth leading cause of cancer-related mortality worldwide. The main treatment modalities for locally advanced disease are surgery with perioperative chemoradiotherapy, and definitive chemoradiotherapy without surgery. The aim of this study was to assess patient preferences and the trade-offs patients they are willing to make when choosing between these treatments.

Methods: A discrete choice experiment (DCE) was conducted based on four attributes: cure rate (10%, 30%, 40%, 60%), risk of death after treatment (1%, 3%, 5%), quality of life following treatment (a little worse, moderately worse, a lot worse) and follow-up schedule (standard follow-up with endoscopy every 3 months for 2 years, endoscopy every 3 months for 2 years then annually for 3 more years (total 5 years) or 8 more years (total 10 years)). Four respondent groups were recruited: patients under surveillance for OC, OC survivors, clinicians, and the general population. Data was analyzed within the framework of random utility theory.

Results:

Ninety-two surveillance patients, 80 clinicians, 35 survivors and 100 from the general population completed the DCE. All respondent groups had significant preference for a higher cure rate (40% and 60% compared to 30%) and were averse to a worse quality of life. Only clinicians were significantly averse to a 5% risk of death compared to 1%. Higher coefficients were observed for worse quality of life than cure rate for all groups except clinicians and the general population.

All respondent groups had >50% probability of choosing preoperative chemotherapy with surgery (reference: cure rate= 40%, death=3%, QoL=moderately worse, follow-up=standard) over definitive chemotherapy without surgery (reference: cure rate= 30%, death=1%, QoL=a little worse, follow-up=3 more years). Varying attribute levels for definitive chemotherapy from the reference, cancer survivors preferred preoperative chemotherapy with surgery regardless of change in attribute levels. For the other groups, the preference changed (probability >50%) to definitive treatment when preoperative treatment had a 40% cure rate. When attribute levels for preoperative chemotherapy were varied, definitive treatment was preferred if cure rate was reduced to 10% (all groups) and to 30% (except for cancer survivors), and if QoL was a lot worse (all groups).

Conclusions:

Preoperative chemotherapy with surgery was preferred by all groups to definitive chemotherapy without surgery. This could be associated with the certainty of no cancer recurrence and reduced anxiety following surgical removal. Significantly important factors when deciding treatment regime were cure rate and quality of life, and quality of life was in fact more important than cure rate for patients under surveillance and cancer survivors. These findings should be used to help guide clinicians in recommending treatment modalities.

Ind-537 Revisiting Health, Income, and Life Satisfaction: A Comparative Replication Study

PRESENTER: **Tinna Laufey Asgeirsdottir**
AUTHOR: Viktor Andri Karason

In 2018, two studies were published, placing a monetary value on health-related quality of life. In both cases the compensating income variation method was used on the same data set (Household Income and Labour Dynamics in Australia - HILDA). The differences in results across studies are difficult to reconcile, even though one paper focused on the whole Quality Adjusted Life Years (QALYs) while the other examined changes in QALYs. Specifically, the reported valuations ranged from A$42,000 to A$67,000 for a whole QALY under one approach, while the other paper found a value of A$39,000 for a 4% health decline and A$162,000 for a 10% decline. We investigate these differences and try to reconcile these seemingly irreconcilable results by (*a*) replicating each paper, using the same data and methods described in each paper, (*b*) estimating both papers using the exact same sample and waves, and (*c*) re-estimating key analyses from each paper, but using some methodological approaches from the other paper. Results show that most of the differences across these papers can be explained by the differential treatment of income in the estimations. In one of the papers, financial worsening is used to instrument household income, and the other uses financial improvement directly in the life-satisfaction equation. This showcases the sensitivity of compensating income variation estimates to the treatment of income in life-satisfaction estimations, and in turn underscores the need for methodological consistency to be developed within the compensating income variation literature. **Keywords:** Replication, Compensating Income Variation, Health, Income, QALY

Ind-755 Econometric Model Derived From Meta-Analysis to Estimate VSL and VOLY Associated to air Pollution at a Global Level

PRESENTER: **Sara Ciarlantini**
AUTHORS: Vito Frontuto, Alessandro Pezzoli, Andreas Gavros, Claudio A. Belis

Air pollution is a key determinant of health, with numerous studies linking it to a range of adverse health effects in the general population, from minor subclinical impacts to premature mortality. Exposure to air pollution is now the second leading fatal health risk worldwide, accounting for 8.1 million deaths in 2021 (Health Effects Institute, 2024). In financial terms, premature deaths due to air pollution exposure to both ambient and household sources cost the global economy about $5.11 trillion in welfare losses (World Bank/Institute for Health Metrics and Evaluation, 2016).

Addressing policy questions on the health impacts of air pollution requires methods that balance the costs of risk reduction with the expected benefits, measured in terms of prevented premature deaths. Associating a monetary value with human life is, therefore, as much challenging as important.

The benefits of prevented mortalities can be expressed in terms of a Value of a Statistical Life (VSL), an economic parameter representing individuals' willingness to exchange wealth for mortality risk reduction. In addition, the monetary Value of a Life Year (VOLY) is also an important parameter to be measured, as it considers the change in life expectancy associated with air pollution. However, obtaining reliable VSL and VOLY values is challenging, as methodologies vary widely across—and even within—countries. Furthermore, most countries have insufficient and unreliable VSL and VOLY estimates. Lack of country-specific data and of common methodology affects the comparability between countries in global assessment and makes it difficult to assess climate policy at a global scale. To address this gap, a database of 494 air pollution-related VSL estimates was compiled from the available literature, including both peer-reviewed papers and technical reports. The final database covers 186 countries across all continents. These country-specific estimates serve as inputs for the meta-analysis conducted, with the aim of integrating them into a specific econometric model assessing only the share of health costs attributable to air pollution worldwide. The model incorporates economic, socio-economic, demographic, and health proxies to tailor VSL estimates to each country's characteristics. This approach, new in air pollution analysis, enables a more specific application of VSL in policy contexts specific to each country.

Since air pollution does not directly cause death but worsens pre-existing health conditions, it is crucial also to consider the VOLY measure. VOLY is often favoured over VSL in cases involving reductions in life expectancy, such as chronic exposure to air pollution. Therefore, a corresponding VOLY database was developed, derived from VSL-based estimates. Notably, this air pollution-related country-specific VOLY database represents the first of its kind in the literature. The outcome of the present work is expected to contribute to better quantitative estimates of the economic benefits associated with air pollution abatement policies and the consequent prevented number of premature deaths worldwide.

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Ind-952 How do Breast Cancer Patients Trade-Off Benefits and Risks in Treatment Decisions? A Discrete Choice Experiment (DCE).

PRESENTER: **Dr. Hui Yee Yeo, PhD**
AUTHORS: Carlo Marra, Mudassir Anwar, Gin Nie Chua, Catherine Han

Background:

Breast cancer (BC) imposes substantial burdens on healthcare system, patients, and society. While advances in treatments provide diverse options, they also complicate decision-making due to the varied benefits, risks, and costs involved. Conventionally, optimal treatment strategies have been primarily physician-driven, often with limited consideration of patients' values and preferences. Integrating patient preferences into treatment decisions can promote transitioning towards a patient-centred approach, potentially enhancing health outcomes and adherence. This study aimed to identify key attributes that influence treatment decisions and quantify patients' benefit-risk preferences for advanced BC treatment.

Methods:

Patients' preferences for BC treatments were evaluated using formative qualitative interviews followed by an online DCE. Treatment alternatives were characterized by six attributes identified during the qualitative phase: overall survival (OS), risks of hair loss (HL), risks of peripheral neuropathy (PN), waiting time to assess treatment (WT), out-of-pocket cost (OOP), and quality of life (QoL) in terms of difficulties in performing daily activities and selfcare. The survey consisted of 24 choice tasks, each featuring two unlabeled alternatives, divided into two blocks; participants were randomized to each block. The survey results from the pilot tests were used to optimize the final DCE design. Participants were recruited via NZ BC patient advocacy groups via email and social media channels. The DCE data were analyzed using mixed logit model; the estimated model results were used to compute the relative attribute importance as well as treatment trade-offs in terms of maximum acceptable risks of PN, marginal willingness to pay (mWTP) and willingness to wait (mWTW). The MXL model was also extended to include additional interaction effects between the attributes and participants characteristics to explore drivers of preference heterogeneity.

Results:

Analysis of 233 completed responses showed that OS was the most important attribute, followed by QoL. Risk of PN, WT, risk of HL, and OOP costs were relatively less important but showed significant differences across levels. Sub-group analyses revealed significant preference heterogeneity based on sociodemographic characteristics. For instance, patients solely treated within the public healthcare system placed less importance on OS compared to those in private or mixed systems. Māori respondents demonstrated a significant aversion to increased OOP costs compared to non-Māori participants. The benefit-risk trade-off analysis showed that patients were willing to tolerate a maximum 20.6% increase in PN risk for one additional year of OS and a maximum 51.6% increase for QoL improvements. Respondents were willing to pay $582 per month for a year of increased OS and $1,457 per month for QoL enhancements. Conversely, patients would pay $28 per month to avoid a 1% increase in PN risk. The mWTW analysis indicated that patients were willing to wait up to 6 months to avoid QoL reductions and up to 2 months for a year of increased OS.

Conclusion:

This study reveals strong patient preferences for OS and QoL in BC treatment, with notable heterogeneity across sociodemographic groups. Aligning these insights with clinical guidelines can enhance shared decision-making by ensuring treatment aligns with patient values, while also informing policy-making.

Ind-1748 A Fair Innings? Estimating Preferences for Prioritising the Less Healthy

PRESENTER: **Matthew Robson**
AUTHORS: Tom van Ourti, Owen O'donnell, Erik Schokkaert

The fair innings principle of health resource allocation gives priority to those who would otherwise have fewer quality-adjusted life years (QALYs). However, it leaves scope for different interpretations and intensities of this prioritisation. We conduct an experiment, with a UK general public sample (n = 230, *obs.* = 20*,*700), to test support for different interpretations and to measure the intensity of support for the principle. We specify social welfare functions (SWFs) representing alternative interpretations, estimate participant-specific parameters within each SWF and identify which SWF best fits each participant's choices. We find overwhelming support for the fair innings principle, broadly defined. *Prioritarian* SWFs - that display continuously diminishing marginal welfare from QALYs - fit the data better than *threshold* SWFs - that are linear in QALYs with weights that decrease discontinuously on reaching a 'fair innings'. We illustrate policy consequences of using the estimated SWFs in decision making, and identify welfare weights by quality-adjusted life expectancy.

Keywords: Fair Innings, Social Preferences, Inequality Aversion, Experiments.

JEL: C90, D30, D63, I14, I38. 2

Ind-1779 Active Transport Health Model: Valuing the Health Benefits of Active Transport

PRESENTER: **Mary Wanjau**
AUTHORS: Christopher Standen, Holger Möller, Mr. Lennert Veerman, Fiona Haigh

Background Physical inactivity is one of the contributors to the rise in non-communicable diseases worldwide. Active transport, which refers to modes of transport that involve physical activity such as walking, cycling and walking and cycling to and from public transport stops, offers a known means of raising physical activity at a population level. However, forecasting and valuing the health benefits of transport projects that increase physical activity (PA) is challenging. **Aim** To develop a best-practice method to estimate the health benefits of changes in active transport behaviour and translate these benefits to an economic value. **Methods** With oversight from the cross-agency advisory group, a previous version of the multistate lifetable model was amended to develop the A*ctive Transport Health Model*. The model is a proportional multi-state lifetable that quantifies the health impacts of changes in active transport behaviour over a population's lifetime. The Model was parameterised to New South Wales (NSW), a state in Australia, and NSW Treasury guidelines were followed. Health outcomes related to PA, air pollution and road trauma exposures are modelled. Model outputs include age- and sex-specific changes in disease incidence, prevalence, mortality, summarised as health adjusted life years (HALYs) and healthcare costs. The HALYs are then translated to monetary terms. These health benefits are valued in accordance with current *Office of Impact Analysis* recommendations. A central (reference case) scenario was modelled based on a mode-specific intervention scenario for walking, cycling and public transport. In the main analysis, a 5% discount rate was applied. Values per additional km of walking and cycling are reported. Various sensitivity analyses were conducted. **Results** Compared to car use, results from our reference case put the value the health benefits at A$5.24 (95% uncertainty interval [UI] $4.73 to $5.70) for a km walking, and A$ 2.95 (95% UI $2.71 to $3.17) an additional km cycled. The results vary systematically and substantially with age and physical activity level, with great benefits for the old and the inactive and much lower gains for the young and for the segment of the population that already achieves high levels of PA. The choice of the value for a healthy life year and the discount rates for health effects and costs impacts the results. **Conclusions and implications for policy and practice** The per-km values in our study were higher than those of previous similar studies, which is largely due to the inclusion of a direct link between PA and mortality, and the use of accelerometry-derived relative risks. The values can allow the monetised health benefits of PA to be factored into decision making on transport projects. The Model could also be used to determine the potential health benefits of other policies aimed at increasing populations' physical activity levels. Additional steps to account for non-health benefits and costs are required for full cost-benefit analyses. The Model is pending approval for adoption by relevant state and local agencies in NSW.

Ind-1996 In Search of a Preferred Time Preference Elicitation Method in the Health Domain: Testing the Consistency Between Direct and Indirect Approaches

PRESENTER: **Qiqi Liu**
AUTHORS: Cong Li, Jingxian Wu, Danlei Chen

Abstract Text:

Background:

Time preference, representing individuals' preferences over intertemporal tradeoffs, plays a crucial role in health-related decision-making. Despite extensive research on individual time preferences, no agreement has been reached on the optimal method for measuring time preferences in the health domain. Considering the importance of accurately capturing time preferences for designing effective health interventions and policies, guidelines are needed to identify the preferred elicitation methods. This study aimed to test the consistency of time preference indicators in the health domain elicited through direct (self-reported) and indirect (experimental) approaches.

Methods:

Data for this study were collected through a structured household survey conducted in six counties of Shaanxi Province, China, during July and August 2023. Using a multistage stratified random sampling method, the survey included 2,878 rural individuals aged 18 to 65 from 1,377 households. Direct (self-reported) time preferences were assessed through planning horizon (years) and self-rated long-term preference (measure on a 0-10 scale). Indirect (experimental) time preferences were elicited using iterative choices between immediate mild health losses and delayed severe health losses, with indicators calculated using exponential and hyperbolic discounting models. Consistency within self-reported approaches was tested using Spearman's rank coefficient and Kendall's tau-b correlation. For experimental methods, consistency across discounting models was assessed using the Wilcoxon signed-rank test. Ordinary least squares (OLS) and nonlinear least squares regressions were applied to evaluate the consistency between self-reported and experimental indicators.

Results:

Within direct approaches, planning horizons and self-reported long-term preferences demonstrated moderate correlation, with Spearman's rank coefficient at 0.469 ($p < 0.01$) and Kendall's tau-b correlation at 0.379 ($p < 0.01$). For indirect approaches, time preference indicators derived from exponential and hyperbolic discounting models showed significant differences ($p < 0.01$) based on the Wilcoxon signed-rank test. Comparing across direct and indirect methods, both OLS (-0.006, $p < 0.10$) and nonlinear least squares regressions (0.0008, $p < 0.10$) revealed a significant relationship between planning horizons and discount rates under the exponential discounting model. However, self-rated preferences showed no significant association in either model.

Conclusion:

Time preference indicators elicited through self-reported approaches achieved moderate consistency, whereas the consistency within experimental approaches and across the two methods was lacking. These inconsistencies highlight the limitations of relying on a single method for measuring time preferences in the health domain. Future research should employ diverse elicitation methods to capture time preferences comprehensively and explore the underlying causes for the inconsistences across approaches. Such efforts are crucial for advancing the design of effective health interventions and improving the measurement of time preferences in health-related contexts.

Ind-2084 Can Willingness-to-Pay Measure Welfare Loss Due to Cancer ? A Contingent Valuation Assessment on French Breast Cancer Patients in Remission

PRESENTER: **Hélène Huber**, Paris 1 Pantheon-Sorbonne University and Paris School of Economics
AUTHORS: Brigitte Dormont, Thomas Vermeulin, Clémence Thébaut

In this paper we present the protocol and results of a survey of more than 1,000 breast cancer patients in remission. The purpose of this survey was to elicit willingness to pay that allows us to assess in monetary units the welfare loss due to cancer. More broadly, the aim of this survey is to enable us to perform health technology assessments by using a cost-benefit analysis based on the notion of Health-Equivalent Income instead of the traditional Cost-Effectiveness approach. As stated in Fleurbaey et al, Health Economics (2013) and Samson et al., Health Economics (2017), the approach based on the Health-Equivalent Income makes it possible to build a social welfare function that allows for the preferences of individuals regarding their health and income and that considers the concern of the regulator for inequalities between individuals in these two dimensions. This approach also eliminates debates over cost-effectiveness thresholds often used to decide on the reimbursement of expensive treatments. With the rising cost of innovative treatments in cancer proposed by the pharmaceutical industry, this approach is particularly relevant.

To date, the Health-Equivalent income methodology has been applied only in evaluating hypertension treatments (Samson et al., 2017). That study demonstrated that incorporating fairness and individual preferences into cost-benefit analysis is feasible. Given the significant pain, mortality risks, and welfare loss associated with cancer, applying this methodology to cancer treatment evaluation seemed vital. This is especially true for breast cancer, the most common and deadliest cancer among French women (INCa, 2024).

The concept of Health-Equivalent Income reflects an individual's income minus their WTP to achieve perfect health. Eliciting this metric for breast cancer posed challenges due to patients' stress and the risk of relapse. Nonetheless, a partnership with a French nonprofit cancer hospital enabled us to contact cancer patients in remission, of whom 1,200 women accepted to participate, and 1,000 were eligible. Remarkably, 80% of respondents demonstrated comprehension of the survey, proving the feasibility of such research even on a sensitive topic.

The survey collected socio-demographic data and details about the timing and severity of cancer, as well as conditions related or unrelated to cancer. Respondents were presented with hypothetical scenarios comparing their current health state to an improved one (e.g., no cancer-related conditions). They were asked what portion of their income they would forgo to enjoy this improved scenario for the rest of their lives.

Preliminary analysis reveals that, on average, women were willing to give up approximately €700 per month (equivalent to €210,000 over 25 years) to avoid a relapse. This figure represents the average value women place on mitigating welfare loss due to the risk of relapse. This methodology is operational for quantifying the welfare impact of various aspects of living with cancer.

This novel approach to measuring welfare loss provides valuable insights for health policy decision-making. By monetizing welfare losses associated with cancer, the method offers a robust framework for evaluating the societal and individual value of health interventions, facilitating more informed and equitable health policy decisions.

abs-os86 Risk in Preferences for Population-Based Breast Cancer Genomic Risk Screening: A Methods Case-Study in Discrete Choice Experiment

PRESENTER: **Cun Liu**, University of Melbourne
AUTHORS: Ilias Goranitis, Mr. Dean A Regier

Background: Over the last decade, advances in genomic technologies and research have significantly enhanced our understanding of cancer susceptibility genes. In many health-care systems, clinical genetic testing for pathogenic variants associated with cancer is offered based on family history. However, most high-risk pathogenic variant carriers remain unidentified. Population-based genomic cancer risk screening provides a transformative opportunity for cancer prevention, early detection, and targeted management. Understanding patient preferences for genomic risk screening is critical for enabling high value health care. Discrete Choice Experiment (DCE) is an established approach to elicit individual preferences, values and priorities for informing the evaluation and implementation of health technologies and services. DCEs inherently assume that individuals are utility maximizers, choosing the healthcare option that provides them with the highest utility. The dominant framework underlying this utility-maximizing behavior is the linear Random Utility Maximization framework, where the respondent utility from a healthcare intervention can be modeled as a linear additive function of the intervention's key components. However, a major limitation of this linear specification is the risk-neutral and belief-neutral assumption. A growing evidence-base now highlights that cancer screening choices are conditioned on behavioral and psychological factors, primarily related to risk attitudes and perception of risk, for example based on their family cancer experiences. The objective of this study is to explore different methods to 1) demonstrate how to best incorporate risk attitudes and perceptions in preference elicitation and choice modelling using breast cancer as an exemplar; 2) investigate how individuals perceive and value information related to their breast cancer risks in a population-based genomic risk screening program, and how risks attitudes and perceptions influence cancer screening.

Methods: Seven focus groups were conducted to identify and develop the choice attributes and attribute-levels. Focus groups were recorded, transcribed, and analyzed using inductive content analysis and 6 attributes were identified. Three DCE experiments are now in progress to elicit preference and values of population genomic risk screening for individuals at different levels of breast cancer risk. Bayesian D-efficient designs with status quo alternative are used. Measures of risk attitudes and perceptions include: perceived cancer risk; cancer worry; health risk attitudes; consideration of future consequences scale; attitudes toward uncertainty. Alternative behavioral frameworks will be incorporated to accommodate risk attitudes and perceptions in choice modelling. The DCE surveys will be administrated to nationally representative samples of the Australian public. Data collection is expected to be completed by the end of 2024 and analysis will be completed by May 2025.

Results: The study will derive empirical estimates of willingness-to-pay and uptake for population-based breast cancer genomic risk screening and assess how the values vary based on individual's cancer risk and risk preferences.

Conclusions: This study will provide quantitative evidence on how risks attitudes and perceptions influence decisions to take up genomic screening programs, and how this information can be used to optimize design and outcomes of such programs.

abs-os215 Living Large or Long? Preference Estimates from Completed-Life Stories

PRESENTER: **Erzo Luttmer**
AUTHORS: Joshua Schwartzstein, Tomáš Jagelka, Amitabh Chandra
Background The value of a year of life plays a crucial role in informing policy decisions related to healthcare, the environment, innovation, and safety regulations. In healthcare, treatment costs are often measured in dollars per Quality-Adjusted Life Year, and decisions about pursuing certain treatments are sometimes guided by whether this cost falls below a specific benchmark for a life year, as is the case with the UK's National Institute for Health and Clinical Excellence (NICE). Given the significance of a life year's value for policymaking, estimates should accurately reflect people's preferences. Currently, estimates are derived from individuals' observed choices involving small risks of death and monetary compensation, such as their willingness to take riskier jobs for higher pay. However, these estimates have significant limitations: individuals may not correctly perceive small risks, may deviate from rationality for choices involving small probabilities, and those making such choices, like soldiers or firefighters, represent a non-representative sample. Furthermore, unobserved job characteristics related to risk can bias these estimates. **Methods** Our paper introduces an alternative method for estimating the value of a life year, attempting to overcome these limitations. We present a broadly representative sample of U.S. respondents with choices between pairs of "completed-life stories", asking which life they would prefer for themselves. By randomizing lifetime earnings and ages of death in each story, we estimate how the probability of choosing a particular story increases with higher lifetime earnings versus a later age of death. **Results** We find that a 7% increase in lifetime earnings increases the choice probability as much as a 1% increase in longevity, implying a Life Year Value (LYV) elasticity of 7. Consequently, a typical individual with median earnings of $80,000 annually values an additional life year at age 80 as equivalent to receiving an additional $5,700 per year for all working years, totaling approximately $225,000 over their lifetime. We validate our estimates by

demonstrating high test-retest reliability across survey waves and establishing their robustness through a series of specification checks and additional randomizations. Furthermore, we estimate markedly higher LYV elasticities for individuals whose subjective attitudes indicate that they place an above-average value on an additional life year. A key methodological advantage of our approach is that respondents engage in a natural task—assessing whether a life was desirable—which avoids triggering cultural or social norms about paying for life extension. Moreover, our method does not entail decisions under uncertainty, thereby avoiding many known behavioral biases. An important substantive advantage of our approach is that it allows us to estimate how the Life Year Value varies with respondent characteristics, age of death, and lifetime earnings in a broadly representative population. We find that the LYV increases with lifetime earnings and decreases with later life years. **Conclusions** Even when holding constant lifetime earnings and age of death, there is notable heterogeneity in the LYV across individuals. This suggests that tailoring policies to individual preferences can result in welfare improvements.

9:00 AM –10:30 AM WEDNESDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Nusantara 1

Inequality and Vulnerable Populations in Healthcare Demand and Use

MODERATOR: **Amirah Azzeri**,

Ind-1257 Healthcare Demand Response of the North Korean Refugees

PRESENTER: **Yunji Choi**
AUTHORS: Hye-Seung Wee, Sok Chul Hong

Background There are more than 30,000 North Korean (NK) refugees living in South Korea with approximately 1,000 to 3,000 newly entering each year. After spending their first 8-12 weeks in a settlement facility ("*Hanawon*"), they are automatically enrolled in a low cost-sharing public health insurance plan that charges less than US$2 out-of-pocket expenditure per visit, with the aim of helping them recover from their bad health conditions. Then, after 5 years, the income cutoff for their eligibility criteria increases rapidly, resulting in many of their health insurance plan switching to a higher cost-sharing plan with 20-30% coinsurance rate.

Objectives In this study, we investigate how NK refugees respond to an increase in cost-sharing. We first examine the responses on outpatient and inpatient care. Then, we examine the responses on low-value and overused care and high-value care discussed in the behavioral hazard literature. Lastly, we study whether any drug interruptions happened.

Methods We use the Korean National Health Insurance (NHI) administrative claims data to identify all NK refugees living in South Korea and examine their medical records. Exploiting the fact that income criteria for the NK refugees increases sharply after the first 5 years since entry, we define a staggered treatment timing: the year of switch from low cost-sharing plan to high cost-sharing plan. We estimate (1) a two-way fixed effect model among the NK refugees and (2) an event time difference-in-differences using matched South Koreans as a control group. We restrict the sample to those who switched from low to high cost-sharing plan only once and those who entered South Korea within a period between 2008 and 2018. The final sample consists of 5,934 NK refugees and 95,416 South Koreans.

Key results Our results provide three interesting findings. (1) We find that, when faced with an increase in cost-sharing, the NK refugees reduce their outpatient visits by 24 percent while the probability of hospitalization does not decrease. The magnitude of the responses is similar to those found in the existing literature, but a big level difference exists – NK refugees use 40% lower than their matched South Korean counterparts under high cost-sharing plan. (2) The use of physical therapy drops by 15.4 percent and imaging services by 7.0 percent but diabetes patients tend to adhere to their medication. (3) Most importantly, we find a sharp and persistent drop in the probability of getting a prescription on anti-psychotropic drugs.

Conclusions: We find that NK refugees have large behavioral hazard problems while showing smaller signs of moral hazard. Cutting back on anti-psychotics could be of concern given that NK refugees suffer from various mental illnesses and have 3 times higher suicide rates than the South Koreans. It is important to note that typical measures of high-value care, such as medication adherence of patients with diabetes, are not applicable to vulnerable population like NK refugees who tend to suffer from under-nutrition and where only 2% are diagnosed with diabetes. Examine whether information treatment helps mitigate behavioral hazard in the vulnerable population could be useful.

Ind-1351 Unmet Needs for Care in Europe: Are Immigrants and Native-Born Individuals Equal?

PRESENTER: **Sandy Tubeuf**, Université Catholique de Louvain
AUTHOR: Luigi Boggian

Inequalities in access to care between immigrants and native-born individuals contribute to immigrants' unhealthy assimilation, influencing their long-term health trajectories. Most existing literature focuses on measuring disparities in the actual utilization of health services, with fewer studies examining disparities in forgone care. These studies reveal substantial heterogeneity in access to healthcare and health insurance coverage across Europe, highlighting the roles of socioeconomic status, country-specific health insurance schemes, and health needs in predicting forgone care.

This study assesses disparities in forgone healthcare between native-born individuals and immigrants in 14 European countries using data from the Survey on Health Ageing and Retirement in Europe (SHARE). We contribute to the literature on healthcare access disparities across social groups by focusing on self-reported unmet care needs. Immigrant status is defined based on country of origin, identifying several groups: European and non-European first-generation immigrants, non-European second-generation immigrants, and non-citizens. Using a

comprehensive set of controls to proxy health needs and socioeconomic status, we employ linear and non-linear regression models to examine disparities in healthcare access between immigrant and native-born adults. Furthermore, we explore additional confounders identified in the literature to understand correlations with forgone care and their role in explaining group disparities. First, we account for culture-related factors, including religiosity and linguistic affinity between host and origin countries. Second, we examine social trust, financial risk aversion, and health insurance coverage.

Our results indicate that both first- and second-generation immigrants, as well as non-citizens, are more likely to forgo care, even after controlling for health needs and socioeconomic factors. These effects are predominantly driven by immigrants of non-European origin. Among the potential explanatory factors, language barriers, religiosity, and health insurance coverage partially account for the observed disparities.

Country-specific analyses confirm the pooled-sample results and provide detailed estimates of gaps in forgone care across countries. In particular, first-generation immigrants have a higher likelihood to report unmet needs for care comparatively to native-born individuals in Luxembourg (11 p.p., significant at 1% level), Estonia (5.2 p.p., significant at 10% level), Sweden (4 p.p., significant at 5% level), France (3.9 p.p., significant at 5% level), Slovenia (3 p.p., significant at 10% level), and Belgium (2.9 p.p., significant at 10% level). Second-generation immigrants are also more likely to forgo care than the native-born respondents in Estonia (6 p.p., significant at 1% level), Luxembourg (4.7 p.p., significant at 10% level), and Czech Republic (2.7 p.p., significant at 1% level).

Sensitivity checks show that our findings are robust to changes in model specifications and to the exclusion of the oldest cohorts.

Ind-368 Disparities in Emergency Department Utilisation, Wait Times, and Costs for Priority Population Children and Young People

PRESENTER: **Rezwanul Rana**
AUTHORS: Karen Zwi, Raghu Lingham, Jahid Khan, Henry Cutler

Background: The inflow of unplanned and non-urgent admissions to emergency departments (ED) presents a significant challenge to healthcare systems. These admissions often result in overcrowding, straining resources and compromising patient care. The increased patient volume for minor conditions can delay care for those needing immediate medical intervention, potentially compromising patient outcomes. **Objective**: We analysed disparities in non-urgent and unplanned ED admissions, average ED wait times, and costs between priority and non-priority populations using electronic medical record (eMR) data in Australia. Additionally, we investigated whether mean wait times and costs differed between these groups. **Method**: This study analysed prospectively collected eMR data of ED attendances for children and young people (CYP) aged 0-17 years at the Sydney Children's Hospital Network (SCHN) between January 2015 and December 2019. Four priority populations were identified from the data. Patients were categorised as Indigenous Australian, Culturally and linguistically diverse (CALD), refugee/ asylum seeker, and National Disability Insurance Scheme (NDIS) recipients. Generalised Linear Mixed Models were employed to account for the clustering of repeated observations within individuals since some patients had multiple return visits, resulting in both admission and discharge. **Results**: The study analysed 446,924 ED visits recorded in the SCHN eMR database, including 148,529 visits from people CYP in priority groups. CYP from Indigenous Australian backgrounds had a significantly higher likelihood of urgent ED admissions (55% higher) and experienced longer wait times (3% longer) and higher ED costs (3% more) compared to non-priority CYP. Additionally, CALD CYP had an 11% increase in wait times (0.11; SE: 0.15), while CYP receiving NDIS services experienced an 8% increase (0.08; SE: 0.01) relative to non-priority CYP. After adjusting for demographic, socioeconomic, and disease-specific factors, Indigenous Australian CYP had 1.55 times higher odds (OR: 1.55; SE: 0.05) of urgent admissions than non-priority CYP. Similarly, NDIS recipient CYP, had 1.63 times higher odds of non-urgent admissions (OR: 1.63; SE: 0.06) than non-priority CYP. However, CALD CYP had significantly lower odds of urgent admission (15% less likely; OR: 0.85; SE: 0.02). In terms of unplanned ED visits, refugee/asylum seeker CYP exhibited significantly higher odds (1.83 times) compared to non-priority CYP. Indigenous Australian (OR: 1.12) and CALD CYP (OR: 1.11) also had statistically significant, albeit smaller, increases in unplanned visit odds relative to non-priority CYP. Female CYP had lower (27%) odds of non-urgent ED admissions (OR: 0.73; SE: 0.01) across all priority groups. Chronic conditions significantly increased the odds of non-urgent admissions across all groups, highlighting a substantial impact (4 times higher) on ED utilisation. **Conclusion**: Our study revealed that priority population status significantly predicts disparities in ED use (urgent vs non-urgent; planned vs unplanned), wait times, and costs. The elevated odds of unplanned ED visits among refugees/asylum seekers and CALD CYP suggest gaps in access to preventive and ongoing care for these groups. Policies should consider resource reallocation within ED to accommodate the distinct needs of priority CYP groups.

Ind-2493 Inequality in Hospitalization Utilization Among Geriatric Population in India: Evidence from the 75th Round of NSSO Survey

PRESENTER: **Piyush Kumar**

Background: Health inequalities are a critical concern in developing nations, where socioeconomic disparities often limit equitable access to healthcare services. Using data from the 75th round of the National Sample Survey Office (NSSO) in India, this study examines inequality in hospitalization utilization, focusing on the concentration of service use among the geriatric population (aged 60 and above) and the key factors driving these disparities. This enquiry becomes critical in light of the Government of India's efforts to universalize health coverage for all citizens aged 70 and above. **Methods**: We conducted an inequality decomposition analysis of hospitalization data using survey-weighted logistic regression and concentration indices. The concentration index (CI) and its normalized counterparts—Erreygers' and Wagstaff's indices—were calculated to quantify inequality in hospitalization utilization. A decomposition approach was applied to identify the contributions of chronic illness, wealth quintile, education, insurance, gender, and other socioeconomic factors to the observed inequality. **Results**: The concentration index (CI) for hospitalization was found to be 0.044, indicating a mild pro-rich inequality in service utilization. The Erreygers' index (0.051) and Wagstaff's index (0.062) further confirmed this inequality. Logistic regression analysis revealed that individuals with chronic illness had 81% higher odds of hospitalization (OR = 1.81, 95% CI: 1.60–2.05, $p < 0.001$), while insurance coverage increased the odds of hospitalization by 22% (OR = 1.22, 95% CI: 1.17–1.28, $p < 0.001$). Women were significantly less likely to utilize hospitalization services (OR

= 0.73, 95% CI: 0.68–0.79, p < 0.001), highlighting potential gender disparities. Wealth quintile, insurance status, and household occupation emerged as the primary contributors to inequality, accounting for the largest shares in the decomposition analysis. **Conclusion**: Hospitalization utilization in India exhibits a mild pro-rich inequality, driven predominantly by socioeconomic factors such as wealth and insurance coverage. While chronic illness remains a critical determinant of hospitalization, the gender gap and urban-rural disparities suggest the need for targeted interventions. Expanding insurance coverage and addressing gender and wealth-based barriers could enhance equity in healthcare access.

Ind-2596 Affordability of HIV and Hypertension Treatment Among People Living with HIV in Public and Private (not-for-profit) Clinics in Uganda.

PRESENTER: **Faith Kagoya**

AUTHORS: Faith Kagoya, John Baptist Kiggundu, Rachel Nugent, Donna Spigelman, Chris Longenecker, Atousa Bonyani, Drew Cameron, Savio Mwaka, Fred Semitala, Robert Twine

Background:

Hypertension (HTN) poses a significant health challenge for people living with HIV (PLHIV), particularly in Uganda where adult HIV prevalence is 5.8% and HTN affects 21-29% of PLHIV. integrating HTN care into HIV services, as advocated by the WHO and Uganda Ministry of Health, is recommended. However, frequent medication stockouts in public health facilities often drive patients to private facilities and results in the potential for high out-of-pocket (OOP) expenditures, threatening adherence to HTN care and leading to catastrophic health expenditures (CHE).** This study aims to evaluate the affordability of HIV and HTN treatment under the standard of care to identify socio-economic predictors of CHE among PLHIV in Uganda.

Methods:

From March 2023 to September 2024, we collected baseline data from 367 randomly selected patients at 16 HIV clinics in Kampala and Wakiso districts as part of a larger trial studying the integration of HTN care in HIV clinics. Information on direct and indirect costs was gathered in a pretested questionnaire and costs were recorded in Ugandan Shillings (UGX). CHE was defined as healthcare costs exceeding 10% of household income or 40% of expenditure after deducting essential expenses such as food and rent. We performed logistic regression to examine predictors of CHE and Gaussian regression to analyze socio-economic predictors of total healthcare spending. Predictors included duration of hypertension, household size, income levels and employment status.

Results:

Patients had a mean age of 48.7 years (SD=10.7), 64% were female, and the average household size was 5.8 (SD=3.5). None of the patients had health insurance. Over 35% sold assets or obtained loans or credit to pay for medical care. Overall, 49.0% (95% CI: 43.9–54.2%) of patients experienced CHE by either definition, with 43.3% (95% CI: 38.3–48.5%) reporting direct and indirect financial costs exceeding 10% of household income, and 18.8% (95% CI: 15.1–23.1%) reporting costs exceeding 40% of household expenditure after essential expenses. Patients had significantly higher odds of CHE by time since diagnosis with ORs of 1.93 (95% CI: 1.06–3.54) for 1-2 years, 2.52 (95% CI: 1.19–5.32) for 3-5 years, and 2.32 (95% CI: 1.12–4.83) for 6+ years, compared to those diagnosed within the past year. Participants in the highest income quintile had significantly lower odds of experiencing CHE, compared to those in the lowest (OR 0.045, 95% CI: 0.02–0.11). Employment status was a significant predictor of CHE, with self-employed participants having lower odds of experiencing CHE compared to wage or salaried workers (OR 0.57, 95% CI: 0.36–0.90). Larger household sizes were not significantly associated with CHE. Gaussian results showed that each additional household member was associated with a 5.7% increase in total healthcare spending, and each additional year of living with HTN led to a 6% increase in total spending.

Conclusion:

The high prevalence of CHE highlights the need for policies that improve access to affordable HTN care for PLHIV. Strengthening public sector service delivery, implementing national health insurance schemes, and addressing the financial barriers could reduce the economic burden.

9:00 AM –10:30 AM WEDNESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Lotus

Improving Child Health

MODERATOR: **Karen Grépin**,

Ind-1417 Is a Trained Community Health Worker at Well-Child Care Visits Sustainable? Cost Analyses Using the United States Disease Expenditure Study Results

PRESENTER: **Marcia Weaver**, University of Washington

AUTHORS: Taylor Salaguinto, Tumaini Coker, Sarah Lowry, Esha Dwibedi

Background: Parent-focused Redesign for Encounters, Newborns to Toddlers (PARENT) is a team-based approach to care with a trained community health worker (PARENT coach) as part of the well-child care (WCC) team who provides preventive services to children ages 0-2

years. We conducted a cluster randomized controlled trial of PARENT coaches among 10 clinics from two federally qualified health centers in California and Washington. The intervention increased the anticipatory guidance as reported by the parent or caregiver, and improved WCC visit adherence, but did not decrease emergency department (ED) utilization.

Research questions: 1) Did the PARENT intervention increase non-WCC healthcare costs? and 2) Would the revenue from additional WCC visits due to improved adherence cover the direct intervention costs?

Methods: To answer question 1, we collected data on utilization and estimated cost of care using a unit cost approach. Parents were interviewed at baseline, six, and 12 months, and asked about the number of encounters and the child's diagnosis at each encounter for four services: subspecialty referral, ambulatory and urgent care visits, ED visits, and hospitalizations. Unit cost estimates for these services by health condition, and age were from the United States Disease Expenditure Study (DEX), which was the DEX estimate of 2016 spending (in 2016 United States dollars) divided by the number of 2016 encounters. We mapped each parent-reported encounter to a DEX health conditions, assigned a unit cost, and calculated total spending at baseline and during the 12-month trial. DEX provided 1,000 draws for each unit cost. We performed two-part model estimates for each of the 1,000 draws, with covariates for group, baseline spending, and child's age at enrollment.

To answer question 2, We created a revenue model based on American Academy of Pediatrics' Bright Futures Periodicity Schedule of visits by age and a cohort of children who entered at birth and progressed through visits. We calculated revenue from the improved WCC visit adherence using observed cohort sizes (minimum, mean, and maximum) and payment rates. Direct cost was the PARENT coach salary and benefits, adjusted for percentage of time devoted to the intervention.

Key results. Among 914 enrolled participants, 785 (86%) completed the 12-month interview and were included in analyses. Cost of subspecialty referrals was lower in intervention ($638, 95% uncertainty interval (UI)=365, 1403) than usual care group ($850, 95% UI=474, 1944), but the UI overlap. Total cost of ambulatory and urgent care visits, ED visits, and hospitalizations was also lower in the intervention group ($1867, 95% UI=1578, 2159) than usual care group ($1937, 95% UI=1628, 2271), but the UI overlap. Based on mean volume of newborns (5.8 per week), marginal revenue from increased WCC visits would cover the intervention costs at Washington payment rates. Based on maximum volume (13.5 per week), revenue would cover the cost at California payment rates.

Conclusions. The PARENT intervention increased WCC visits without increasing the cost of other care. Clinics may be able to recoup some or all of the costs of the PARENT coach through its effect on WCC visit adherence.

Ind-1694 Health Equity in Rare Diseases: The Diagnostic Odyssey and Cost-Effectiveness of Whole-Genome Sequencing for Indigenous Children

PRESENTER: **Mr. Dean A Regier**, BC Cancer
AUTHORS: Emanuel Krebs, Morgan Ehman, Ms. Deirdre Weymann

Introduction: Genetic and genomic sequencing diagnoses childhood rare diseases. Benefits of a diagnosis include a shorter diagnostic odyssey and the value of knowing disease cause. These benefits are not equitably distributed to Indigenous children. Indigenous ancestries are underrepresented in the background variant libraries necessary to establish etiologic diagnoses. We have found that whole genome sequencing (WGS) is not cost-effective in non-Indigenous Canadian populations, but access to research-based whole-genome sequencing (WGS) may establish additional diagnoses in Indigenous children in Canada. We estimate the diagnostic rate and cost-effectiveness of WGS for Indigenous children with developmental and/or seizure disorders. **Methods**: We obtained the diagnostic rate of WGS in Indigenous children from a single-arm Indigenous-partnered clinical trial in Canada. We abstracted real-world standard of care (SOC) outcomes data from British Columbia's Children's and Women's Hospital (C&W). Longitudinal and time-to-event analysis characterized key outcomes, including time to diagnosis and cost. We incorporated this evidence into a probabilistic state-transition Markov model examining two strategies. The first strategy is SOC, involving chromosomal microarray followed by second-tier genetic and biochemical testing, with last-tier exome sequencing. The second strategy is first-tier WGS. We calculated incremental cost per additional diagnosis over a 10-year time horizon, from the healthcare payer perspective, using a discount rate of 1.5%. **Results:** Our cohort included 63 Indigenous children who underwent WGS. For SOC, we estimated that 24.1% (95% CI: 17.1,31.2) of children would receive a diagnosis at a cost of $11,728 per patient (95% CI: 9,158,14,297). First-tier WGS diagnosed 39.0% (95% CI: 31.3,46.7) of children at a cost of $9,768 (95% CI: 6,296,13,241). Incremental costs and diagnoses were -$1.960 (95% CI: -6,308,2,389) and 14.9% (95% CI: 4.5,25.2), respectively. Mean time to diagnosis among diagnosed patients was 24 weeks for WGS, compared to 50 weeks for SOC. First-tier WGS was dominant (less costly, more effective) in 81% of simulations compared to SOC. **Conclusion:** Real-world evidence determined the impacts of research-based WGS for diagnosing genetic causes of rare diseases in Indigenous children in Canada. We find that first-tier access to WGS provides additional diagnoses to Indigenous families, sooner. Access to diagnostic WGS for Indigenous children furthers equity.

Ind-2050 Distributional Assessment of Health and Economic Impact of Population-Based Newborn Screening for Spinal Muscular Atrophy in Argentina

PRESENTER: **Natalia Espinola**
AUTHORS: Natali Soto, Constanza Silvestrini, Fernando Argento, Carla Colaci, Andrés Pichon-Riviere, Soledad Monges, Maria Jose Varco
Background Spinal muscular atrophy (SMA) is a rare, debilitating genetic disorder that greatly impacts quality of life and causes high costs for individuals and society in general. Evidence indicates that early diagnosis through newborn screening (NBS) and timely intervention with available treatments can significantly improve health outcomes and reduce costs. However, its impact on distributional equity remains unknown. **Objective** This study evaluates the distributional impact of the implementation of population-based NBS for SMA in Argentina by socioeconomic level. **Methods** We conducted a distributional cost-effectiveness analysis using a hybrid model framework combining decision tree and Markov structures. The decision tree captured the immediate outcomes of NBS, while Markov modeling projected long-term health and economic impacts across different socioeconomic levels. The model utilized the type of health coverage accessible to individuals

based on their income as a proxy for socioeconomic status. Variables such as differential access to medical care, differential delay in diagnosis and treatment, and cost differences between socioeconomic levels were included in the model. Model parameters were sourced from literature, local data (e.g., national surveys, patient registration database, unit cost database), and expert opinion. All costs were reported in US dollars 2024 (USD). **Results** The implementation of NBS for SMA in 529,794 newborns in Argentina resulted in a total gain of 402 QALYs, with 52% benefiting the lowest socioeconomic group, and generated a total saving of USD 650,000 in productivity loss and informal care costs. With the introduction of the NBS population intervention, an important impact on equity is estimated. The QALY inequality gap was reduced by 91%, from 0.82 to 0.07 per individual; and the inequality gap in social costs was reduced by around 60%, with the lowest socioeconomic group experiencing the greatest benefit. **Conclusions** Population-based NBS for SMA is not only cost-effective but also advances health equity, addressing disparities in access and outcomes. These findings offer valuable insights for policymakers seeking efficient and equitable health strategies.

Ind-2742 Cost-Effectiveness of Technologies for the Diagnosis of Attention Deficit Hyperactivity Disorder (ADHD)

PRESENTER: **Mary Ward**
AUTHORS: Nicky Welton, Josephine Walker

Background

Diagnosis of ADHD is complex and time consuming, and NHS waiting times for ADHD assessment are long. Sensor continuous performance tests (CPTs), including QbTest, are technologies for objective measurement of ADHD that use motion sensors to measure hyperactivity. This may improve the diagnostic process for ADHD. We aimed to develop a decision-analytic model to estimate the cost-effectiveness of QbTest in addition to clinical assessment ("QbTest") compared with clinical assessment alone ("Standard") for the diagnosis of ADHD in children referred with suspected ADHD. We restricted to QbTest as the only sensor CPT with sufficient data.

Methods

We did not identify any previous models evaluating cost-effectiveness of diagnostic tests for ADHD, and so we developed a *de novo* Markov model for sensor CPTs for the diagnosis of ADHD in people referred with suspected ADHD. Model parameters were sourced from our systematic review, targeted literature searches and expert opinion. Patients enter the model after referral for ADHD assessment, and join a waiting list. The time spent waiting for assessment is assumed to depend on whether a sensor CPT is used, because a potential benefit of the use of sensor CPTs is to reduce the time and resources required to reach a diagnosis, releasing clinician time and therefore reducing waiting times for assessment. Patients then undergo diagnostic assessment for ADHD which consists of a series of appointments until a diagnosis is reached or assessment is discontinued. An NHS and personal social services (PSS) perspective was taken. We conducted probabilistic sensitivity analysis (PSA) to reflect uncertainty in model inputs.

Results

Under the base case scenario, the QbTest strategy has higher costs and quality-adjusted life-years (QALYs) gained compared to Standard, with incremental costs of £238.35 and incremental QALYs of 0.0385 per person evaluated for ADHD. The resulting ICER is £6183.71 per QALY gained, and the mean incremental net benefit is £532.55 at a willingness-to-pay (WTP) threshold of £20,000/QALY. Exploring the impact of uncertainty in the input parameters, the QbTest strategy is cost-effective under 92% of model runs with a £20,000 WTP threshold. These findings were driven by reduced time waiting for assessment, reduced appointments until diagnosis, and a higher proportion receiving a diagnosis so that more patients with ADHD receive treatment benefits.

Discussion

We found that the use of QbTest in addition to clinical assessment is likely to be cost-effective in the diagnosis of children referred with suspected ADHD. Further evidence is needed to assess cost-effectiveness of alternative sensor CPTs, sensor CPTs in adults, and in medication management.

9:00 AM –10:30 AM WEDNESDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Jasmine

Socioeconomic Drivers of Health Disparities: Case Studies from Around the Globe

MODERATOR: **Chen Chen**,

Ind-535 Inequalities in Alcohol-Related Mortality in Goi s: Analysis of Deaths and Years of Life Lost in 2022

PRESENTER: **Larissa Barbosa Cardoso**, UNIVERSIDADE FEDERAL DE GOIAS
AUTHORS: Isadora Batista Rodrigues, Tálita Silva Vilela

Background: The state of Goiás has one of the highest prevalences of alcohol abuse in Brazil, with approximately 17% of the population engaging in harmful alcohol consumption in 2013. Excessive alcohol uses not only harms health but also increases the risk of traffic and workplace accidents, along with generating losses in the labor market. Alcohol abuse disproportionately affects groups with specific sociodemographic characteristics. Although there is extensive literature on alcohol consumption in Brazil, few studies address the inequalities

associated with this issue, and most are limited to national-level analyses, overlooking regional specificities. **Objectives:** This study aims to analyze inequalities in alcohol-related mortality in Goiás in 2022, focusing on deaths directly attributed to alcohol consumption. **Methods:** We used data on deaths recorded in the Mortality Information System (SIM) for the year 2022 in the state of Goiás, along with demographic data provided by the Brazilian Institute of Geography and Statistics (IBGE). Only deaths from diseases fully attributable to alcohol, based on ICD-10 codes, were considered. Crude mortality rates were calculated by dividing the total number of deaths by the total exposed population and were expressed per 1,000 inhabitants. Additionally, years of potential life lost (YPLL) were calculated as the sum of the differences between the age at death and life expectancy for each age group. Crude mortality rates and YPLL were analyzed across different population subgroups categorized by gender, race, and age. **Results:** In 2022, a total of 927 deaths directly related to alcohol consumption were recorded in Goiás. The leading causes of death were alcoholic liver cirrhosis and mental disorders such as alcohol dependence syndrome. The results showed a crude mortality rate of 0.13 deaths per 1,000 inhabitants for the total sample, with higher rates observed among men (0.23 per 1,000 inhabitants), individuals of Asian descent (0.29 per 1,000 inhabitants), and those aged 55–59 years (0.35 per 1,000 inhabitants). Regarding years of potential life lost, the average was 22.13 years per death. The highest losses were observed among men (22.26 years/death) and individuals of mixed race (23.44 years/death). **Conclusion:** This study highlights the significant burden of alcohol-related mortality in Goiás, with disproportionate impacts on specific subgroups. Premature mortality in these groups leads to social and economic consequences that may exacerbate existing social inequalities. The findings underscore the urgent need for public policies aimed at reducing alcohol consumption and addressing inequalities.

Funding: This work was developed with support from the Research Support Foundation of the State of Goiás (FAPEG).

Ind-386 Maternal Education and Long-term Health Outcomes for the Next Generation. Causal Effects Measured using the Introduction of a School Reform in Norway.

PRESENTER: **Jostein Grytten**, Universitetet i Oslo
AUTHORS: Irene Skau Sr., Rune Sorensen

Background: The positive association between education and health is well established. Numerous studies have examined whether this association is causal. The usual outcome measure is mortality. The results differ, but in most studies, there is evidence that education leads to lower mortality for men, but not for women.

The aim of the present study was to examine intergenerational effects of maternal education on long-term health outcomes. In a few studies, intergenerational effects of maternal education on short-term health outcomes (birthweight, infant mortality) have been examined. In most of these studies a causal effect has been found. Little is known about intergenerational effects of maternal education on long-term health outcomes for the next generation. Partly, this is due to lack of data covering a long enough time span from birth to adult life for the next generation. The question is whether the short-term effects persist over time and last into adult life, or whether they fade out.

Methods: During the period 1960-1972, all municipalities in Norway were required to increase the number of compulsory years of schooling from seven to nine years. We used this reform as the instrumental variable to create exogenous variation in the individual's number of years of schooling (first stage regression). Since municipalities implemented the reform at different times, we have both cross-sectional and time-series variation in the instrumental variable. Thus, we could estimate the causal effects of mothers' number of years of schooling on our outcome variables (second stage regression) by controlling for municipality fixed effects and trend variables.

The education data were combined with population register data from the Norwegian Labour and Welfare Administration and the Norwegian Cause of Death Registry. Our sample included all mothers born during the period 1944-1960. We measured long-term health outcomes for the children when they were between the age of 20-40, both those who had died, and those who were still alive (n=529 000). We had data for our long-term outcomes up to 2020. In order to measure long-term outcomes at the age of 20-40 years, the child had to be born in 1980 or earlier.

Results: The first stage regression estimate showed that the reform led to an increase of 0.40 years of schooling (F-value=1024). The reduced form and second stage estimates showed significant negative effects for both outcomes. One year of additional education for the mothers led to a reduction in the proportion their children who died by 26%, and in the proportion of their children who received health disability allowance of about 7%. For sons, a large part of the effect on mortality was due to fewer deaths caused by traffic accidents. For daughters, the effect on mortality was due to fewer deaths caused by suicide, and alcohol and drug abuse. We carried out several robustness tests such as balancing tests and event study analyses. The results supported our main findings.

Conclusion: Rising the** level of education of the mothers, is an important mechanism through which long-term health outcomes for the next generation can be improved.

Ind-536 The Growing Divide: Income Inequities in Access to Mental Healthcare in Australia

PRESENTER: **Danusha Jayawardana**, Monash University
AUTHORS: David Johnston, Nicole Black, Trong-Anh Trinh

Rising out-of-pocket costs for psychological therapy in Australia have heightened concerns about financial barriers to mental healthcare, particularly for lower-income households, who disproportionately experience psychological distress. This study examines how income-related inequity in access to psychological therapy has evolved over the past decade. Using linked administrative data from the Australian Taxation Office and Medicare, covering almost the entire Australian population, we estimate the magnitude of inequity in psychotherapy use among individuals diagnosed with a mental health condition. Regression-based inequity estimates are provided separately for each year from 2014 to 2023 to capture potential nonlinear changes over time. We also conduct separate analyses for children (<18 years old) and adults (25-54 years old), given that differences in the willingness to pay, prices, and access to services may lead to different healthcare utilisation patterns. Our

findings show that income-related inequity is consistently higher for children than for adults throughout the study period. Furthermore, while inequity has worsened for both groups over the past decade, the increase has been particularly pronounced for children since the onset of the Covid-19 pandemic. The trends persist across demographic and geographic subgroups, and robustness checks confirm that the rising inequity is not attributable to changes in the severity or complexity of mental health disorders. These results underscore the need for policy interventions to reduce financial barriers and promote equitable access to mental health care.

Ind-1432 Socioeconomic Inequalities in Ideal Cardiovascular Health in Kenya: A Decomposition Analysis

PRESENTER: **James Odhiambo Oguta**
AUTHORS: Penny Breeze, Catherine Akoth, Elvis Wambiya, Grace Mbuthia, Peter Otieno, Gladwell Gathecha, Elizabeth Onyango, Yvette Kisaka, Peter Dodd

Background During the last three decades, Kenya has experienced a substantial rise in the burden of cardiovascular diseases (CVDs), the leading causes of non-communicable diseases (NCD) deaths. To guide the equitable scale-up of prevention interventions, it is essential to understand patterns of inequality in cardiovascular health (CVH). A useful framework for this is ideal cardiovascular health (iCVH), which is defined by four health behaviours [diet, tobacco use, physical activity (PA), and body mass index(BMI)] and three biological health factors (blood pressure [BP], fasting blood glucose [FBG], and total cholesterol). This study assessed the extent of socioeconomic inequality in iCVH in Kenya, the gender differences in the socioeconomic inequality, and decomposed the inequality to examine its drivers. **Methods** We used data from the 2015 World Health Organization (WHO) STEPwise survey on NCD risk factors. We classified an individual to have an iCVH status if they had at least five out of seven CVH metrics (tobacco exposure, fruit and vegetable intake (FV), PA, BMI, FBG, BP, and cholesterol levels) at ideal levels as defined by American Heart Association 2010. The concentration index (C) was used to assess the socioeconomic inequalities in overall iCVH. We performed Wagstaff-type decomposition analysis of the inequality to examine its drivers, and conducted sensitivity analyses to explore the gender-differences in inequalities. **Results** The study sample included 3816 adults aged 18-69 years. The overall C was positive (C= 0.08; p=0.006), indicating that iCVH was more concentrated among the rich (pro-rich). Pro-rich inequalities were observed in ideal BMI (C= 0.31; p<0.001), ideal BP (C= 0.16; p<0.001) and ideal cholesterol (C= 0.15; p=0.005) metrics, while pro-poor inequalities were observed in ideal tobacco exposure (C= -0.1; p=0.012) and FV (C= -0.09; p=0.048) metrics. There were no significant inequalities in ideal FBG (C= -0.03; p=0.534), and PA (C= 0.05; p=0.291). The gender-stratified analyses revealed significant pro-rich inequalities in iCVH among females (C= 0.11; p=0.006) but not in males (C= 0.07; p=0.128). Wealth (30.7%), urban residence (31.4%), region (16.5%), and education (8.5%) were the highest contributors to the observed pro-rich inequality in iCVH. Among females, wealth (45.2%), urban residence (24.4%) and education (12.8%) were the highest contributors to the observed inequality, whereas urban residence (27.6%), wealth (27.2%) and region of residence (24.6%) were the highest contributors among males. Ethnic disparities contributed between 5.3% and 9.9% of the observed inequality in all groups, with the Kikuyu ethnic group being the highest contributor (2.1%-5.2%). **Conclusion** This study finds pro-rich and gender differences in the inequalities in iCVH in Kenya. The study highlights the need for the design and scale up of equity and gender-focused interventions targeting the poorer and less-educated individuals especially in urban areas.

9:00 AM –10:30 AM WEDNESDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Dahlia

Financial Burdens of Health Care and Poverty

MODERATOR: **Stephen Jan**, The George Institute for Global Health, UNSW Sydney

Ind-339 The Relationship Between Health Costs and Poverty in Rare Genetic Diseases in Australia

PRESENTER: **Josh Kraindler**
AUTHORS: Rupendra Shrestha, Deborah Schofield

Background Rare genetic diseases present a unique challenge for health systems, with complex diagnostic and treatment pathways. In Australia, an estimated 6-8% of the population is affected by rare diseases, approximately 80% of which are genetic. The conditions lead to significant health costs for affected families. These financial pressures are compounded as the individuals affected and their families are already vulnerable to reduced income and workforce participation due to the chronic and debilitating nature of their conditions. Given the rarity of each disease, rare diseases are often neglected from research and policy due to a lack of data on each condition, including on out of pocket (OOP) costs and poverty. Using a combination of primary and linked administrative data, this study aims to estimate the financial burden in three clinical cohorts with different rare genetic diseases, focussing on how health spending contributes to poverty in households with these diseases. **Methods** Data were collected from a cohort of Australian households impacted by three rare genetic diseases; familial intellectual disability (ID), mitochondrial disorders, and inherited retinal diseases (IRD). The study utilised primary data from the three studies, which were then linked with administrative healthcare records, enabling a comprehensive account of healthcare and other disease related costs for each disease. OOP expenditures were classified into direct medical costs (such as medications, surgeries, and consultations) and societal costs (such as transportation, caregiving, and home modifications). Using income data and an established measure of income poverty in Australia – the Henderson poverty line – we estimated the proportion of patients in poverty with each of the three diseases, and the potential contribution of health costs to contribute to or exacerbate poverty. **Results** Across the three diseases, average annual OOP costs related to the disease ranged from approximately $2,800 to $7,050 AUD, with substantial differences between the diseases and within each disease. These costs are significantly higher than average annual OOP costs across the population. On average, patients and their carers had below average incomes when matched to those in the population with similar characteristics. **Conclusion** Rare genetic diseases impose a substantial financial burden on Australian families, pushing many vulnerable households into or closer to poverty. Estimates of income poverty may underestimate poverty for those with rare diseases due to the increased costs these families face. These findings highlight the need for policy action to reduce OOP costs

for families with rare diseases. Future research should examine the long-term economic impacts on affected families to guide policies promoting equitable access to healthcare and reducing poverty rates.

Ind-2776 Effect of Medicare Advantage Versus Traditional Medicare On Financial Burdens of Healthcare Among Older Adults With and Without Dementia: 2017-2021

PRESENTER: **Elham Mahmoudi**

Research Objective. Medicare pays Medicare Advantage (MA) plans based on a prospective capitated model. About 50% of older adults are enrolled in MA, incentivized to offer more efficient care than traditional Medicare (TM). We aimed to examine the effect of MA vs. TM on the financial burdens of healthcare. We hypothesized that MA enrollees would have fewer financial burdens than TM.

Study Design. In this cross-sectional case-control study, we pooled data from the 2017-2021 Medicare Current Beneficiary Survey (nationally representative of older adults in the U.S.). We used multivariable generalized linear models to examine the financial burdens of care, utilizing three outcomes (delayed care due to cost, problem paying medical bills, and dissatisfaction with out-of-pocket (OOP) costs. We examined the outcomes among (1) everyone and (2) those with less than 200% of the federal poverty level (FPL) who were not in Medicaid, with and without dementia. All models were adjusted for age, gender, race/ethnicity, chronic conditions, functional status, family income as a share of the FPL, Medicaid, education, rurality, interview language, and survey year. We applied Inverse Propensity Weighting to address the potential selection bias into MA and the Average Treatment Effect (ATE) to examine the effect of MA vs. TM on financial burdens.

Populations Studied: Community-dwelling older adults (65+) with and without dementia diagnosis who enrolled in TM or MA. [N=54,216 (MA=23,082; with-dementia=1,232); (TM=31,134; with-dementia=1,475)].

Principal Findings: Among people without dementia, a higher percentage of MA vs. TM enrollees had problems paying medical bills [MA=7.04%; TM=5.25%; diff=1.79 percentage point (PP) (95% CI:1.28, 2,31)] but lower percentage had dissatisfaction with OOP cost [MA=12.18%; TM=13.78%; diff=-1.59 PP (95% CI:-2.32, -.87)]. A higher percentage of people with dementia had financial burdens compared with those without dementia, with no significant difference between MA and TM [difficulty paying the medical bills (MA=9.54%; TM=7.41%), delaying care due to cost (MA=6.27%; TM=7.40%); and dissatisfied with OOP costs (MA=13.57%; TM=14.46%)]. Financial burdens were more pronounced among older adults with <200% FPL who did not have Medicaid. In this group, for example, among people without dementia, 13.29% in MA vs. 10.85% in TM [diff=2.43PP (95% CI:1.01, 3.86)] had problems paying medical bills; 18.15% in MA vs. 20.42% in TM [diff=-2.27PP (-4.01, -.53)] were dissatisfied with OOP costs. Among people with dementia with <200% FPL who did not have Medicaid, the financial burdens were higher compared with dementia patients with higher income levels, but the outcomes were not statistically different between MA and TM [difficulty paying the medical bills (MA=14.35%; TM=11.35%), delaying care due to cost (MA=8.40%; TM=11.98%); and dissatisfaction with OOP costs (MA=19.27%; TM=19.68%)].

Conclusions: Older adults with and without dementia whose incomes were less than 200% FPL but did not have Medicaid had the highest financial burdens. A higher percentage of MA vs. TM enrollees had problems paying medical bills or delaying care due to cost, but a higher percentage of TM vs. MA enrollees were dissatisfied with OOP costs. Financial burdens of care were higher among people with dementia, with no difference between MA and TM.

Ind-678 Did State Medicaid Policies Increase Telemedicine Use? A National Survey Analysis of U.S. Working-Age Low-Income Adults and Their Children

PRESENTER: **Lucinda B. Leung**
AUTHORS: Susan Ettner, Haiyong Xu, Jasmeen Santos, Jose Escarce

Background: Telemedicine historically existed to close access gaps in specialty, especially mental health, care services. During the COVID-19 pandemic, U.S. Medicaid insurance programs for low-income Americans adopted different policies on telemedicine services, making it possible to naturalistically examine the effect of telemedicine policy changes on care access. This study aimed to examine whether the number of pro-telemedicine Medicaid policies adopted by states predicted greater telemedicine use among low-income Americans and their children.

Methods: Our cohorts included 18- to 64-year-old U.S. adults with Medicaid insurance in all 50 U.S. states (n=107,442) and the subset of those with children under 18 (n=54,988). Responses about telemedicine use were obtained from the Household Pulse Survey (4/14/2021-8/8/2022), a repeated online cross-sectional survey administered by the U.S. Census Bureau and National Center for Health Statistics. Our two outcomes were 1) adults and 2) their children having an "appointment with a doctor, nurse, or other health professional by video or by phone" in the last 4 weeks. Using legal mapping methods, we identified whether, and the date when, states adopted Medicaid policies (e.g., audio-only reimbursement) promoting telemedicine delivery. Linear probability models predicted association of telemedicine use with the number of Medicaid state policies adopted, controlling for state fixed effects, survey week, respondent characteristics (age, sex, race-ethnicity, education, income, marital status, number of children), and time-varying state characteristics (unemployment rates, COVID-19 cases/deaths/vaccination rates, COVID-19 emergency policies). Models used multiple imputation, included survey weights and adjusted for robust standard errors. We also stratified models by whether respondents/parents reported any current psychological symptoms (Patient Health Questionnaire-2[Depression] or Generalized Anxiety Disorder-2 ≥3).

Results: 32.8% of adults with Medicaid insurance and 23.1% of their children sought health care by video or phone during the last 4 weeks. By the study period's end, states had a median of 3 Medicaid telemedicine policies (range: 0-6). In fully adjusted models, there was no significant policy effect on telemedicine use among adults. However, we observed a significant policy effect, increasing with the number of policies, on

children's telemedicine use, ranging from 3 to 7 percentage points in states with 3 policies or more. Among children with parents reporting current psychological symptoms, telemedicine use increased by 6 to 13 percentage-points in states with 3 policies or more. There was no significant policy effect on telemedicine use among children of parents without current psychological symptoms.

Conclusions: Many U.S. states adopted Medicaid policies and as intended, enabled flexible healthcare delivery to low-income populations via telemedicine. Although there was no policy effect on adults, parents reported that their children were more likely to use telemedicine when more policies were in place. Importantly, Medicaid policies most increased telemedicine use among children of parents in psychological distress. Potential explanations include correlation between children's and parents' health (e.g., parents worry about sick children), parents prioritizing their children's health needs over their own, and parental concern over children's wellbeing during the pandemic. Findings suggest policies promoting telemedicine use may overcome access barriers related to travel, time, and/or mental health stigma for disadvantaged populations.

Ind-2151 Health Effects of Universal Non-contributory Pensions: Evidence from Mexico

PRESENTER: **María-José Mendoza-Jiménez**, Erasmus University Rotterdam

AUTHORS: Bram Wouterse, Carlos Javier Riumallo Herl

Background and aim: Poverty at old-age is a growing concern for policymakers, particularly in lower and middle-income countries where many older individuals lack access to contributory pensions. Several countries, including Mexico, have implemented non-contributory pension programs aimed at ensuring a dignified and healthy old age. Existing literature highlights the positive impacts of such programs on health and wellbeing when targeted specifically at low-income groups. Less is known on the effects of programs for the entire older population. In 2019, Mexico turned its non-contributory pension program into a universal scheme known as the "*Programa Pensión para el Bienestar de las Personas Adultas Mayores" (*PBAM). The expansion of the program to all who are age-eligible has sparked support but also concerns about its efficiency. Understanding the program's effect on health and wellbeing is crucial for a comprehensive evaluation of the policy's costs and benefits. This study aims to identify the health effects of the PBAM policy among age-eligible older adults. Methods: We analyse panel data for approximately 13,500 adults aged 50 years or older from four waves of the Mexican Health and Ageing Study (MHAS), covering the period from 2012 to 2021. The pre-policy periods correspond to 2012 (wave 3), 2015 (wave 4) and 2018 (wave 5), as the PBAM policy was introduced in 2019. We employ a differences-in-differences approach to estimate the effects by comparing outcomes for individuals aged 65 and older (age-eligible) with those under 65 (non-eligible), both before and after the introduction of PBAM. The analysis focuses on variables such as financial situation, self-reported health, and broader wellbeing. All regressions include individual-level fixed effects. Results: The results reveal a significant increase in individual income, namely 1,300 Mexican pesos on average ($p<0.01$), representing a 26% increase relative to the 2018 sample mean. Statistically significant improvements were also observed for household consumption, perceived financial situation and availability of money for food, confirming that age-eligible individuals experienced better financial stability after the introduction of the PBAM. These financial improvements contributed to health benefits: age-eligible respondents showed a 3 percentage point increase in the probability of positive health changes ($p<0.01$), a 4 percentage point increase in food affordability ($p<0.05$), and a 2 percentage point reduction in stopping medication due to costs ($p<0.05$). While the positive self-reported health changes are observable for all income groups, heterogeneity analyses suggest that health gains are concentrated in the middle-assets groups, and there are no statistically significantly different effects among those who are under and above the previous income condition of the targeted scheme. Conclusions: Our study shows that the PBAM introduction resulted in significant income increases and health benefits in the short-run for age-eligible individuals in Mexico. Universal NCPs can reduce exclusion errors and deliver health benefits beyond the poorest groups, highlighting their potential role in promoting wellbeing in ageing populations.

9:00 AM –10:30 AM WEDNESDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Surabaya

Care Provision and Quality

MODERATOR: **Neeru Gupta**,

Ind-2322 Does the Informal Carer Identification Method Matter? Evidence From Self-Declaration and Time Diary Approaches

PRESENTER: **Mr. Charles Smith, BSc**

AUTHORS: Sean Urwin, Matt Sutton

Introduction:

Informal caregiving is widespread, but there is concern that studies do not identify all the caregiving that is taking place. This may bias estimates of caregiving effects and lead to ineffective support for caregivers. There is little evidence on whether the method of carer identification uncovers different carers and whether these methods result in different conclusions on caregiving consequences.

We aim to investigate whether the use of a time diary compared to when self-declaration is used: (i) identifies more and different carers and (ii) estimates worse outcomes

Data:

We use the Innovation Panel component of the UK Household Longitudinal Study, which is an experimental set of questions asked to a panel of individuals. In wave seven, this included a time diary, which records all activities done in two 24-hour periods and has an activity code for co-

and extra-residential caregiving. Self-declaration as a co- or extra-residential caregiver is asked in all waves of the main and innovation panels.

Methods:

We compare the characteristics of carers identified by a time diary and from self-declaration using linear OLS regression. Using a doubly-robust approach of entropy balancing alongside regression adjustment, we assess whether the association of caregiving with health and wellbeing measures change depending upon the identification method.

Results:

Out of a sample of 1055 individuals, we identify 261 carers by at least one method. 16% of these are only identified through the time diary, and so would be missed if identification was based on self-declaration alone. Time diary-identified carers are more likely to have low household income and be from ethnic minorities. They experience mental health 1.35 points worse on the GHQ-12 scale than non-carers – the equivalent of the effect of being in the lowest income quintile relative to the highest. These results are larger than for self-declared carers in the innovation panel, which themselves are consistent for self-declared carers in the larger main UKHLS survey (N=28,815).

Implications:

Correlations of informal care with health and wellbeing are under-estimated when we only identify carers with self-declaration. Activity-based methods may identify carers earlier and therefore help provide more timely support to carers who may face a greater unmet need for support. Future survey design and the assessment of the scale of caregiving should consider the degree to which caregiving is under-reported. Policies that attempt to aid informal carers should consider that the consequences of caregiving on mental health are greater than currently understood.

Ind-41 Decomposition Analysis of Wage Differentials by Gender and Sexual Diversity in the Canadian Physician and Nursing Labour Markets

PRESENTER: **Neeru Gupta**
AUTHORS: Pablo Miah, Sean Waite

Background: Work is not a gender-equal opportunity for women and men within and across national healthcare labour markets, despite women representing 70% of the global health workforce. Many studies from different countries reveal that women physicians earn significantly less on average than their male counterparts due to factors that remain unexplained, widely attributed to effects of gender discrimination, including fewer opportunities for career advancement among women in the traditionally male-dominated medical profession. Gender wage gaps also persist in female-dominated professions such as nursing, associated with accelerated promotions and other workplace rewards favouring men. The research is less clear on wage disparities for gender and sexual minorities (GSMs). We systematically searched five bibliographic databases and found no empirical studies integrating experiences in the health workforce of devaluation of women's labour with GSM status.

Objective: This Canadian observational study represents, to our knowledge, the first-ever national investigation into earnings differentials among GSM practitioners in the physician and nursing labour markets.

Methods: The 2021 Canadian Population Census was the first large-scale data source (nationally or anywhere) to collect information on both sex at birth and gender identity, along with same-gender couples, thus allowing to distinguish GSM individuals. Medical and nursing professionals are categorized based on the National Occupational Classification. Our outcome of interest is annual earnings from employment or professional practice, as captured through integrated administrative income tax records. First we describe whether the active physician and nursing workforces ages 20-64 reflect the population they serve in relation to gender and sexual diversity. Second, we conduct multiple regression analyses for the roles of gender and GSM status as predictors of earnings differentials (logged), controlling for a range of confounders related to human capital (educational attainment, place of work, hours worked) and intersecting social characteristics (immigration status, racial/ethnic origin, childcare status). The analyses are implemented in Stata v18, applying bootstrapped person-level census weights to ensure population representation of the results and robust 95% confidence intervals.

Results: Among Canada's 387,900 nurses, 1.3% identified as GSM, including 0.3% as transgender or non-binary (similar to 0.33% of the general adult population). Relative to cisgender men nurses, transgender men's earnings averaged significantly less (-18.3%, 95% CI: -30.6 to -3.7) as did those of cisgender women (-11.2%, 95% CI: -12.1 to -10.3); wage differences were not found significant for trans women or non-binary nurses after adjusting for confounders. A similar proportion 1.3% of physicians (N=87,900) identified as GSM. Relative to cisgender men physicians, cisgender women earned significantly less (-12.5%, 95% CI: -14.0 to -10.9) whereas trans men earned more (56.9%, 95% CI: 24.4 to 97.9); adjusted wage differences were not significant for trans women or non-binary physicians.

Conclusions: This research builds knowledge on gender and sexual diversity-related wage gaps to help inform policy and practice for optimizing equity in healthcare labour market access, opportunities, and barriers commonly associated with social discrimination. Results highlighted heterogeneity in health labour market outcomes by gender diversity.

Ind-1768 Developing and Piloting a Life-Cycle Prioritization Framework for Oncology Product Innovation

PRESENTER: **Ms. Deirdre Weymann**, BC Cancer
AUTHORS: Morgan Ehman, Emanuel Krebs, Mr. Dean A Regier

Background: The translational pathway for emerging oncology products is time-consuming. Oncology trials last a median of 13.1 years from Phase I to Phase III, with only 3.4% of trialled products eventually receiving regulatory authorization. Considered alongside the rising costs of cancer care observed worldwide, value-based mechanisms are urgently needed to accelerate the equitable translation of safe, effective, and cost-

effective oncology products into global healthcare systems. We sought to develop and pilot a life-cycle prioritization framework to address translational inefficiencies. Our pilot study implements our framework for prioritizing innovations in targeted radiopharmaceutical development, with a focus on metastatic castration-resistant prostate cancer (mCRPC) in Canada. Targeted radiopharmaceuticals are an emerging class of cancer medicines that bind radionuclides with cell-targeting molecules to deliver radiation directly to cancer cells, without affecting normal tissue. Further research and development are necessary to expand translation of these innovative medicines.

Methods: Through a scoping literature review and multi-disciplinary expert consultations, we developed a life-cycle framework for prioritizing candidate oncology products. We engaged patient partners, clinicians, decision-makers, industry, and health researchers from across Canada to co-develop and refine framework components. We are piloting the framework for a radiopharmaceutical in early scientific development for treating patients with mCRPC. Multi-criteria decision analysis with our stakeholder committee is enabling systematized prioritization of competing products. Evidence synthesis across multiple orthogonal criteria informs total early-stage value, with committee members completing a direct ranking exercise to assess relative importance of competing value elements. Weights derived using rank-ordered probit regression analysis of survey response data allows for scoring of competing radiopharmaceutical products.

Results: Our literature review included 24 articles, which highlighted relevant decision points, value criteria, and evaluative methods for informing our prioritization framework. We then engaged n=15 pan-Canadian stakeholders to refine our framework and ensure suitability and feasibility for oncology product innovation. The final prioritization framework includes three gated stages throughout the entire product life-cycle, with sequentially planned evaluative methods that iteratively guide decision-making. Key components for each stage include: (i) needs assessment for prioritizing product innovation areas; (ii) early value assessment for go/no-go decision-making on continued development and further evidence generation; and (iii) life-cycle health technology assessment to support regulatory and reimbursement pathways. In mCRPC, we are identifying which value elements stakeholders, including patients, prioritize most highly for radiopharmaceutical product prioritization. For initial needs assessment, public health burden, equity and access, healthcare cost, level of innovation, and technology readiness, including radionuclide and ligand availability and biomanufacturing feasibility, have emerged as key criteria for deliberative decision-making. Estimated prioritization scores for mCRPC can be contrasted across products and indications, providing greater transparency in deliberations and systematizing prioritization processes.

Conclusions: Our prioritization framework enables value-based innovation for candidate oncology products, from very early stages of development to evaluation and implementation. Weighted prioritization scores measured in our proof-of-concept study can be contrasted across indications to inform future research and development investment for radiopharmaceuticals. Application of our framework throughout the oncology product life-cycle will ensure translational medicine achieves timely patient benefit and value-for-money in healthcare.

Ind-618 Priority Setting for Effective Maternity Care Models to Improve Outcomes for Women from Refugee Backgrounds in Australia: A Modified Delphi Study

PRESENTER: **Yordanos Yeshitila**

AUTHORS: Julie Abimanyi-Ochom, Ha N.D Le, Elisha Riggs, Linda Sweet, Ms. Lisa Gold

Background Women from refugee backgrounds often experience poor perinatal outcomes due to disparities in access to health and social services. Effective, culturally responsive maternity care models for these women is critical to improving perinatal outcomes. Different models of care were implemented in response to the diverse needs of women from migrant and refugee backgrounds This study seeks to establish expert consensus on prioritizing effective maternity care models and identifying key outcomes. **Methods** A two-round modified Delphi survey was conducted to establish priority models of maternity care for refugee background women, informed by a literature review and expert insights. In the first round, experts prioritised (a) 17 identified models of maternity care, also suggesting additional models through an open-response format, and (b) perinatal outcomes such as stillbirth, neonatal death, low APGAR score, small for gestational age, postpartum haemorrhage, abnormal labour, 3rd/4th-degree perineal tear, puerperal sepsis and maternal admission to intensive care. In the second round, highest-rated models from the first round were scored based on their priority levels, specifically their potential to meet the healthcare needs of refugee background women. A consensus threshold was defined as a model receiving a priority rating from at least 50% of participants. **Results** The initial survey round saw participation from 50 experts across Australia with 31 experts completing the second round. Consensus was achieved on outcomes in the first round, with a majority agreeing that adverse outcomes should be given equal priority in implementing maternity care models rather than prioritising specific outcomes. Experts recommended several additional adverse perinatal outcomes be considered related to implementing care models. Most emphasised the need for a perinatal mental health and support system. Others suggested outcomes including caesarean section, breastfeeding, access to care, satisfaction with/view on care, women's well-being post-birth, gestational diabetes, parenting skills, diet and exercise, pre-eclampsia/hypertensive conditions, fetal growth restriction, terminations and congenital anomalies, family violence, low birth weight, and preterm birth. Six models deemed most relevant in the first round were ranked in the second round, with Refugee Midwifery Group Practice, cross-cultural workers model, community-based antenatal clinic specialising in maternity care for CALD identified as the top three models among the evaluated options. **Conclusion** Health systems should consider adopting adaptable, culturally responsive models such as midwifery-led and multidisciplinary team-based care to better address the needs of refugee women. Incorporating support from cross-cultural workers and doulas may help mitigate social barriers and facilitate care navigation. Establishing standardised outcome measures for maternal quality of life and well-being would allow for better evaluation and comparison of care models. Future research is needed to evaluate the long-term impact and effectiveness of these models on maternal and infant health outcomes. Keywords Perinatal outcomes, consensus, priority setting, Delphi method, maternity care models, refugee-background women

Ind-1043 Who Is Providing Care for the Elderly in Asia? Comparing Five Countries at Different Stages of the Demographic Transition

PRESENTER: **Marie Ishida**

AUTHORS: Victoria Fan, Ajay Singh Mahal, Sumit Kane, Teralynn Ludwick

Asia comprises approximately 60 percent of world population and is experiencing rapid population ageing, with the share of elderly population

expected to rise continuously over the next several decades. The demand for caregiving is also expected to accompany rising numbers of elderly. Traditionally, family members have been the first line of support with female members typically taking the role of primary caregivers for the elderly. However, declining fertility, increases in women's labour force participation and rural-to-urban migration over time have led to fewer household members remaining at home to take up caregiving responsibilities. Despite these shifts in family structure, there is limited understanding of the current profiles of primary caregivers across countries at different stages of demographic transition in the region. We investigate the profile of primary caregivers of older adults (aged 60 years and above) that report difficulty with activities of daily living (ADLs) and factors associated with the use of non-family caregivers in five Asian countries with significant numbers of elderly (China, India, Indonesia, Japan, and South Korea).

Cross-sectional analysis based on data from nationally representative household surveys – the Chinese Longitudinal Healthy Longevity Study (2018), Comprehensive Survey of Living Conditions (2016) from Japan, Korean Longitudinal Study of Ageing (2018), Indonesian Family Life Survey (2014), and Longitudinal Aging Study of India (2017). Primary caregivers were identified from self-reports of respondents. The distribution of primary caregivers by relationship to care recipients (spouse, child, child's spouse, grandchild, other relatives, and non-family members) is described, along with hours of care provided by caregivers classified by their relationship to care recipients. Lastly, socioeconomic and demographic factors associated with the use of non-family caregivers were explored using multivariate linear probability models.

Among respondents experiencing difficulties with ADLs, the share of respondents reporting support by caregivers ranged from 47.5% in India to 90.4% in Japan. Most primary caregivers consisted of family members, with the share of non-family caregivers being 10.3% in Japan and 18.7% in South Korea (excluding institutional care), but fewer than 4.0% in China, India, and Indonesia. Among family caregivers, spouses were the major source of caregiving, but care responsibility transferred to younger generations, mostly women, as care recipient grew older. This generational transition occurred more rapidly in India and Indonesia, where younger cohorts were increasingly assigned to caregiving roles, including in some cases, grandchildren. Median weekly hours of care provided by primary caregivers ranged from 7 hours in Indonesia to 15 hours in South Korea, with caregivers who were spouses contributing the most across all the countries in the sample. Higher socioeconomic status was associated with the use of paid non-family caregivers; and rural residents were more likely to rely on unpaid non-family caregivers than urban residents in China, India, and Indonesia.

Family is the main source of elderly care in Asia, with younger members disproportionately shouldering care burdens in middle-income countries. Demographic transitions further strain family care, increasing unmet care needs where non-family care resources are limited. Strategies to support and substitute family caregivers are essential to meet growing caregiving demands.

Ind-648 From Constitutional Provisions to the Implementation of Basic Health Care Service (BHCS) Delivery in Nepal: Toward Achieving UHC

PRESENTER: **Ravi Kanta Mishra**
AUTHORS: Kjell Arne Johansson, Krishna Kumar Aryal, Shiva Raj Adhikari

Background: Delivering Basic Health Care Service (BHCS) is a commitment of the Government of Nepal to achieve progressive realization of universal health coverage (UHC). This study aims to identify availability, accessibility, quality of care, and utilization and the expenses of the BHCS entitlements in Nepal.

Methods: We analyzed data from the Nepal Demographic and Health Survey (NDHS) 2022 and Nepal Health Facility Survey (NHFS) 2021, focusing on the services included in the Nepal's BHCS package. Descriptive analysis of the key indicators of the BHCS availability, accessibility, quality of service, and utilization was conducted drawing data on 1448 public health facilities, 457 observations and 320 client interviews from the NHFS 2021 and 14,845 women aged 15-49 from the NDHS 2022. The quality-of-care index was calculated with equal weight to three domains: experience of care, standard of care, and service readiness. Secondary data were analyzed from the existing health related financial data (2018/19 to 2020/21) of Local Governments in Nepal from the sub-national treasury regulatory application. Then, the actual expenses of BHCS package were calculated. R 4.3.2 software was used for the analysis.

** **Results:**

Overall, 16 out of 41 services assessed under BHCS package were available at more than 90% of the health facilities, but all 41 services were available at less than one percentage of the health facilities. Two of three women could reach the nearest health facility within a 30-minute travel time. Child health services had low utilization, with growth monitoring (6.0%) being the least used. Care seeking fever (19.6%), diarrhea (25.4%), and acute respiratory infection care (25.5%) were also low, while antenatal care visits (80.5%) and deworming (84.1%) were highly utilized. The overall quality of care index was 69.3 out of 100. Most of the BHCS budget expenses were allocated to health programs followed by health workforce, health infrastructures and health care logistics and medicines over three years periods. Among the different categories of health programs, Maternal, newborn, child health and nutrition programs had the highest share of expenses (> 50%) followed by emergency Health. Other categories, like immunization, non-communicable diseases, and communicable diseases, hovered between 1-10% in three years period.

** **Conclusions:**

Despite constitutional mandate to provide BHCS, this study found low availability of BHCS in public health facilities of Nepal. Although accessibility was not a problem, we found low utilization of services (especially child health) and moderate quality of care. Almost 50% of the total budget of BHCS expenses focused on maternal neonatal child health and nutrition. Categories like non-communicable diseases, mental health and communicable diseases remain underfunded in terms of expenses. Early BHCS implementation showed the need for realism and service review.

Key Words: Accessibility, Availability, Basic Health Care Services, Constitution, Expenses, Nepal, Quality of care, Utilization

Ind-2057 Overprescription of Generic Drugs and Diagnostic Tests: Insights From a Randomized Experiment With Unannounced Standardized Patients in Urban India

PRESENTER: **Mr. Nikkil Sudharsanan**, Professorship of Behavioral Science for Disease Prevention and Health Care, Technical University of Munich
AUTHORS: Vasanthi Subramonia Pillai, Caterina Favaretti, Dimple Janardhan

Background: Overprescription of medications and diagnostic tests poses a significant challenge in many low- and middle-income countries (LMICs). Inappropriate prescribing practices deplete valuable healthcare resources and have serious implications for patient health. For example, numerous studies in LMICs, such as India and Sub-Saharan Africa, highlight the tendency of primary care clinicians to overprescribe antibiotics, even for conditions that do not warrant their use. This has led to an emerging pattern of antibiotic resistance among the LMIC population. However, existing literature on overprescription largely focuses on addictive drugs and antibiotics, with limited attention given to other drug classes commonly prescribed in primary care, such as analgesics, antacids, and anti-inflammatories. Moreover, there is a lack of objective evidence on the systemic factors of clinician overprescription and overdiagnosis. While some studies suggest that overprescription is partly driven by patient demand and the perception that medications signify high-quality care, these factors remain unexamined in the context of non-infectious diseases. Hence, using data from a randomized experiment with standardized patients (SPs, actors depicted as real patients) in India - an important LMIC setting - we aim to address two key objectives. First, we examine the current levels of generic medication over-prescription and inappropriate ordering of screening tests (X-rays, blood draws) among primary care clinicians. Second, we investigate whether prescription and diagnosis patterns systematically differ by category of care requested (curative care vs. preventive care), provider type (public vs. private facilities), incentives (consultation fee), and patient demographics.

Methods: We conducted a randomized experiment using unannounced SPs in two large Indian cities, Chennai and Kolkata. We randomly sampled 600 primary healthcare facilities, evenly split between the two cities and provider type (public and private). For public facilities, we recruited the universe of facilities listed by the Ministry of Health in both cities. Due to the absence of a similar list for private facilities, we compiled one using two widely prevalent business listing services (JustDial and Practo) and then randomly sampled clinics for our study. In each sampled facility, we randomized SPs to seek care for one of two common conditions - lower back pain or preventive hypertension check. After each visit, SPs participated in an in-person exit interview, where all interaction details, including prescription information, were recorded on a tablet.

Results and Conclusion: Our preliminary findings show that among the 600 clinician visits, 355 clinicians prescribed at least one medication. On average, clinicians prescribed 2.6 medications per patient (SD = 1.1), with a mean of 2.8 (SD = 1.1) medications for the back pain group and 1.9 (SD = 1) for the hypertension group. Across all 355 patients, a total of approximately 925 medications were prescribed. We are currently analyzing the data to estimate the degree of inappropriate prescriptions and whether medication prescriptions and diagnostic testing differed by clinic and patient characteristics. A first draft of the results is expected by February 2025. These results will provide critical insights into overprescription for non-infectious diseases, highlighting opportunities to improve prescribing practices and optimize primary care delivery in LMICs.

Ind-814 Impact of Continuity of Primary Care on Hospitalizations and New Complications among Hypertensive Patients: A Longitudinal Study in China

PRESENTER: **Chunlu Yu**
AUTHORS: Wen Chen, Luying Zhang

Background: Chronic diseases pose a major challenge to healthcare systems worldwide. Better continuity of care (COC) has been shown to improve patient health outcomes in many countries. This study aimed to measure the continuity of primary care among hypertensive patients in China and analyze its impact on patients' hospitalizations and new complications. **Methods:** This is a longitudinal retrospective study of 184,299 patients with hypertension based on the medical insurance claims database from a provincial capital city in eastern China. Three indicators, Usual Provider Continuity (UPC), Bice-Boxerman Continuity of Care Index (COCI) and Sequential Continuity Index (SECON) were calculated to comprehensively measure the COC in 2016-2018. Logistic regression models and a zero-inflated poisson regression model were used to examine the impact of COC on the number of hypertension-related hospitalizations and new hypertension complications in the subsequent year (2017-2019). **Results:** In 2016, the average age of the sample population was 67.31 years old and 61.66% of patients had hypertension comorbidities. The average annual number of outpatient visits for hypertension-related conditions was 12.33. From 2016 to 2018, the continuity of primary care increased, with the mean values of UPC, COCI, SECON reaching 0.75, 0.61, 0.74, respectively in 2018. 24.38% of patients consistently visited the same community health center, achieving high COC scores. The proportion of patients with low level of UPC (<0.75), COCI (<0.60), and SECON (<0.75) were 47.87%, 48.56% and 44.34%, respectively. Age, type of medical insurance and comorbidities were associated with higher COC. Compared to the high COC group, the low COC group had a significant higher risk of hypertension-related hospitalizations (OR: UPC: 1.76, COCI: 1.73, SECON: 1.75), as similarly observed in the modest COC group (OR: UPC: 1.41, COCI: 1.38, SECON: 1.40). Additionally, both the low COC group (OR: UPC: 1.53, COCI: 1.50, SECON: 1.52) and the modest COC group (OR: UPC: 1.32, COCI: 1.30, SECON: 1.31) showed an increased risk of developing new hypertension complications. Higher COC was also significantly associated with fewer number of new hypertension complications (IRR: UPC: 0.58, COCI: 0.70, SECON: 0.61). **Conclusion:** This study indicated that** better continuity of primary care could improve health outcomes among Chinese hypertensive patients. However, the COC needs to be further improved. Strengthening the family doctor system and reinforcing the capacity of primary care providers to manage patients with multimorbidity can guide more patients to community health centers, improve the continuity of primary care and further enhance the effectiveness of chronic disease management in China.

Ind-379 Barriers Associated with Unavailable Medicines in Primary Health Care Institutions: A Mixed-Methods Study from China

PRESENTER: **ZhiXin Fan**

AUTHORS: Qing HE, Jia Yin, Qiang Sun

Background With an aging population and the increasing prevalence of chronic non-communicable diseases, medicine needs in primary health centers (PHCs) have become diversified. There is a need to comprehensively evaluate the availability of PHC medicines, as well as the characteristics and reasons for unavailability. **Methods** We used a three-stage sequential explanatory design strategy to conduct a mixed-methods study in Shandong Province, China. We conducted a medication questionnaire for PHC patients and semi-structured qualitative interviews with the pharmacy managers, physicians and patients in township hospitals. In order to validate the qualitative findings, fuzzy-set qualitative comparative analysis (fsQCA) was used to explore the interrelationship between the influencing factors of high medicine unavailability in township hospitals. **Results** We collected information from a total of 6,323 patients. The total number of the population with unavailable medicines was 945 (15.31%). The data showed high unavailability of chronic disease medicines such as Aspirin, Nifedipine, Metoprolol, and Metformin, but for different reasons. Qualitative data revealed that people's medicine needs have become more diverse and refined, and PHCs had insufficient incentive to equip more medicine varieties. Fuzzy-set QCA analysis suggested that there were three configuration paths driving the high medicine unavailability in township hospitals. **Conclusion** While the overall availability of medicines in PHCs is relatively stable, it is noteworthy that the reasons for unavailable medicines vary, and significant variations exist among different PHCs. Additionally, the "Central Pharmacy" may be a novel strategy to establish a unified medicines list, procurement processes, and pharmaceutical services in PHCs. **Keywords** Medicine need, Unavailability, Primary health centers, Mixed-methods study, Central Pharmacy, China

Ind-2296 The Efficiency of Secondary-Level Hospitals in Hard-to-Reach and Non-Hard-to-Reach Areas in Bangladesh: A Data Envelopment Analysis Approach

PRESENTER: **Sayem Ahmed**

AUTHORS: Jahangir AM Khan, Md. Zahid Hasan, Abu Noman, Mohammad Wahid Ahmed

Background: Efficiency in healthcare delivery is crucial for maximizing resource utilization and achieving broader health system objectives, particularly in resource-constrained settings like hard-to-reach (HTR) areas in Bangladesh. Despite people in these areas facing barriers in accessing health services, health facilities have not undergone comparative efficiency evaluations with facilities in non-hard-to-reach (non-HTR) areas. **Objectives:** The study's aim was to assess the association between HTR area characteristics and the technical efficiency of secondary-level hospitals. **Methods:** Data envelopment analysis was performed with output orientation to calculate the efficiency scores of 62 secondary-level hospitals using both constant and variable returns to scale assumptions. We used the number of physicians, nurses and beds available in the hospitals as the inputs for service production. The number of different types of services provided by the hospitals, namely, antenatal care, normal deliveries, postnatal care, outdoor department visits, and hospital admission, were included as the output variables. These input and output data for each hospital were extracted from the Local Health Bulletin-2022 of the Directorate General of Health Services in Bangladesh. Using the Water and Sanitation Program report published by the World Bank in 2012, geographic locations with specific characteristics, such as beel/wetland, coastal, offshore island, saline, and hilly areas, were categorized as HTR areas. We conducted descriptive analysis and performed a Mann-Whitney two-sample statistic test to test the mean difference of efficiency scores between the HTR and non-HTR areas. Finally, multiple Tobit regression models were employed to determine the association between HTR area characteristics and hospital efficiency while adjusting for bed occupancy ratio, average length of stay and administrative division. Results: The findings revealed that, on average, hospitals were 73% and 80% efficient using constant and variable returns to scale assumptions, respectively. Hospitals located in HTR areas were relatively less technically efficient (efficiency score = 0.76) than those in non-HTR areas (efficiency score = 0.84), and the differences were statistically significant (p-value = 0.08) when the variable returns to scale assumption were used. Similar significant differences in efficiency scores (p-value = 0.06) were observed between these two groups of hospitals when constant returns to scale assumptions were used. The regression analysis results showed that hospitals in HTR areas experience lower efficiency scores (coefficient = 0.258; p-value < 0.05) than hospitals in non-HTR regions. Additionally, the bed occupancy ratio and average length of stay were significantly associated with the efficiency scores of secondary-level hospitals. **Conclusion:** Hospitals in HTR regions are found to be less technically efficient than non-HTR regions in Bangladesh. Policymakers should address the underlying causes of inefficiencies and implement targeted interventions such as improving healthcare access for vulnerable HTR area populations, optimizing bed occupancy rates and length of stay with proper referral systems and discharge planning in these particular areas. This indicates that further research on health systems in climate-vulnerable areas in Bangladesh should be prioritized to address these challenges effectively. 2 | Page

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9:00 AM –10:30 AM WEDNESDAY [Evaluation Of Policy, Programs And Health System Performance]

os166 Bali International Convention Centre – Orchid

Health System Reform in Latin America: The Health and Health System Impacts of Reforms Aiming to Reduce Fragmentation

MODERATOR: **Thomas Hone**, Public Health Policy Evaluation Unit, Imperial College London

CONVENER: **Diego Cerecero Garcia**, Imperial College London

abs-os412 A Mixed Methods Evaluation of Regulatory Efforts to Promote Regional Coordination of Secondary Care Services in Brazil (1998-2019)

PRESENTER: **Vinicius Pecanha**
AUTHORS: Frederica Padilha, Renílson Rehen, Thomas Hone, Christopher Millett, Letícia Nunes, Rudi Rocha, Beatriz Rache, Renato Tasca

Background: Globally, many countries have implemented decentralization reforms to strengthen their health systems, yielding varied outcomes. In Brazil's health system was highly decentralised to municipal governments in the 1990s. However, the country now faces issues of fragmentation and low access to secondary care. Re-centralizing governance and service provision into health regions is one option for improving care delivery. Since the 2000s, federal regulations have attempted to initiate health system regionalization. Based on a comprehensive empirical analysis of the patterns of expansion and reorganization of healthcare services and hospitalization flows between municipalities, this study assesses whether the health system reorganized towards a regional model and if this shift correlated with federal regulations. Additionally, it explores the challenges and possibilities to promote regional coordination in decentralized health systems.

Methods: We conducted mixed methods evaluation. In the quantitative approach we used the National Register of Health Facilities and Hospital Information System data for a descriptive analysis of the expansion of health services and applied an adapted gravity model to examine hospital admission flows, analyzing patient movements between their municipalities of residence and hospitalization locations from 1998 to 2019 and potential discontinuities in hospitalization trends around the years of the regulations. In the qualitative approach, a two-round Delphi study with 31 experts in the Brazilian health system was conducted to reach consensus on the main challenges of the regionalization model and potential improvements.

Results: The analysis revealed a broad expansion of healthcare infrastructure and services over the period. The average distance travelled for outpatient procedures, such as emergency services, fell from 10.0 km to 5.6 km, and ICU beds, from 83.5 km to 59.2 km. However, an opposite trend was observed for hospitalizations: in 1999 an average of 18.4 km was travelled for hospital admission, but this rose to 29.6 km in 2019. These changes in patient flow for hospitalizations occurred gradually without significant breaks over the regulatory years, suggesting that the federal efforts to promote regionalization did not have immediate or clear impacts. For the experts consulted in the Delphi study, it was the consensus that the federal regulations played a small role, with the states and autonomous regional bodies with dedicated resources as important enablers of regionally-coordinated care.

Conclusion: The decentralization of the Brazilian health system has created challenges for coordinated health services. This study suggests continued misalignment between the reorganization of resources and flows of patient, and the established health regions. Moreover, this reorganization does not appear related to federal regulation. Remaining challenges include further centralisation of governance, strengthening the role of states, and redefining health regions into broader, more integrated territories.

abs-os315 Does Expanding Health Benefits Improve Health? An Analysis of Colombia's Subsidised Regime Reform

PRESENTER: **Paul Rodriguez-Lesmes**
AUTHORS: Thomas Hone, Giancarlo Buitrago, Sandra Camacho, Diana Pinto

Countries aiming to achieve Universal Health Coverage often expand health benefit plans (HBPs) to include previously uncovered populations or technologies. However, such expansions can generate unintended effects when health system capacity is fixed. This paper studies the impact of Colombia's 2013 reform, which equalized the benefits of the Subsidized Regime (SR) to those of the Contributory Regime (CR), effectively extending access to a wide set of medical procedures and diagnostic services for poor adults.

Using administrative data covering 95\% of the population and a difference-in-differences design, we estimate the effects of the reform on healthcare utilization, availability, and geographic coverage of newly included procedures. We find a substantial increase in use among SR enrollees, concentrated in diagnostic services, alongside a decline in use within the CR—suggesting therapeutic substitution across regimes. The reform also expanded access across municipalities, particularly in underserved areas.

Heterogeneity analyses reveal no clear differential impacts by procedure cost or prior diffusion, highlighting the constraints of supply-side rigidity. These findings underscore that benefit expansions without parallel investments in capacity may lead to redistribution rather than net gains in access. Colombia's experience offers valuable lessons for countries pursuing entitlement reforms under resource constraints.

abs-os420 The Impact of Dismantling Seguro Popular on Diabetes Management in Mexico

PRESENTER: **Diego Cerecero Garcia**
AUTHORS: Thomas Hone, Edson Servan--Mori, Judite Gonçalves, Christopher Millett, Octavio Gómez-Dantés

Background: Mexico has made significant progress towards universal health coverage (UHC) in recent decades. One major UHC-advancing reform was the creation of Seguro Popular (SP) in 2003. By 2018, SP had covered 75% of the country's uninsured population, significantly reduced out-of-pocket expenditures, and increased service utilization. However, in 2019, a major reform replaced SP with another insurance scheme named INSABI. The reform focused on re-centralising financing and service delivery. The INSAB was replaced in 2023 by IMSS-Bienestar (IMSS-B). We assessed the impact of Mexico's SP replacement on diabetes management from 2018-2023.

Methods: We used data from Mexico's National Hospital Discharge Registry and the Registry of healthcare services for diabetes patients. We used ICD-10 codes from the OECD Healthcare Quality and Outcomes Indicators list to identify diabetes hospitalisations. We exploit the natural experiment setting of the SP elimination with 23 out of 32 states adopting the new reforms and the remaining continuing with a decentralised health system. We used event study design to validate parallel trends assumption before treatment and explore impacts over time. We also estimated difference-in-differences models to assess the effects of the reform. Several key events were tested: INSABI discussion and approval

of reform in congress (reference point), implementation of centralised procurement mechanisms, IMSS-B congress discussion and approval, and IMSS-B roll-out.

Results: We analysed data from 274,394 diabetes hospital discharges. Diabetes hospitalisation rates per 100,000 before the elimination of SP increased significantly among adopting states. We also observed a reduction in the proportion of diabetes patients with glucose control after the reforms, mainly among adopting states. Difference-in-differences analyses and event study models confirmed a sustained increase in diabetes hospitalisations after the reform implementation and a significant reduction on adequate diabetes management among adopting states.

Conclusion: This study suggests that SP elimination affected diabetes outcomes and management in Mexico. Potential explanations include disruptions in the continuity of care for chronic conditions as well as inefficiencies and inequalities in healthcare access stemming from the reform. Given the well-documented weakness of the INSABI and IMSS-B reforms, policies to recentralise services and reduce fragmentation should be considered carefully.

abs-os313 The Impact of Reorganising Bogota's Health System on Health Outcomes and Costs in Hypertensive Patients

PRESENTER: **Daniela Sánchez-Santiesteban**, Universidad Nacional de Colombia
AUTHORS: Giancarlo Buitrago, Diana Pinto, Thomas Hone, Christopher Millett

Background: In 2015, Bogotá's health system faced challenges from delays in paying providers, high administrative costs, financial instability, low quality infrastructure, service delivery inefficiencies, and poor care coordination. To address these challenges, the government in Bogotá implemented a public health sector reorganisation to improve comprehensive care, enhance health outcomes, and decrease fragmentation between actors. This study evaluates the impact of the Bogotá health reorganisation on health outcomes and costs in patients with hypertension.

Methods: Administrative data and health records were linked using a unique identifier by the Ministry of Health in Colombia and cross-referenced to generate a cohort of individuals with data points for over 10 years. We employed a difference-in-differences analysis to evaluate the impact of the reorganisation in Bogotá between 2014 and 2018, using 2017 as the intervention year. Patients with hypertension in Bogotá in the subsidised scheme (exposed group) were compared to those in the contributory scheme (control group). We constructed a closed cohort to evaluate clinical outcomes and healthcare costs using fixed effects and a dynamic cohort to assess mortality in the population. Each outcome was measured yearly and at an individual level. Clinical outcomes evaluated included organ damage from hypertension, dialysis requirement, and myocardial revascularisation (myocardial infarction). We also included the number of outpatient and hospitalisation services and mortality. Economic outcomes evaluated total healthcare costs in million COP.

Results: The reorganisation was associated with increased outpatient care services. Conversely, there were associated reductions in adverse outcomes, such as hospitalisations, myocardial revascularisation, dialysis, and mortality. Additionally, total healthcare costs in millions of COP, also reduced. There was a finding that the effects grew larger over time.

Conclusions: The Bogotá health reorganisation positively impacted clinical and economic outcomes in patients with hypertension. These findings suggest that reforms focused on decreasing healthcare fragmentation can yield benefits for chronic conditions such as hypertension in resource-constrained settings.

9:00 AM –10:30 AM WEDNESDAY [Health Beyond The Health System]

os241 Bali International Convention Centre – Magnolia

Can we Define a Reference Case of Methods to Cover Both Environmental and Health Economic Evaluations?

MODERATOR: **Andrew Briggs**, London School of Hygiene and Tropical Medicine

abs-os767 Guideline Development: More Than Just Another Checklist

PRESENTER: **Mireia Jofre-Bonet**, Office of Health Economics

The impacts of climate change are increasingly being felt directly around the world, with negative effects on both human health and healthcare systems already becoming evident. Demand for economic evidence on the health impacts of climate change mitigation actions (or failures to act) is growing; this growing demand is accompanied by a desire to establish robust guidelines for such evaluations.

Our recent scoping review on measuring and valuing the health co-benefits of climate change mitigation actions made a number of findings relevant to guideline development. Unsurprisingly, we found a lack of standardisation in both methods for estimating health impacts of mitigation interventions and for valuing those health impacts. We also found that most of these studies are published in environment rather than health journals. More surprisingly, we found that a large majority of studies in this literature focused on near-term health co-benefits (e.g. from reduced air pollution), and only a small minority actually estimated longer-term health benefits from mitigating climate change itself.

Yet before addressing technical issues, any discussion of guideline development in this area must start further upstream, with questions of purpose and scope. Who would use guidelines in this space: researchers, policy makers, research funders, journals etc.? Why would they use

them: to guide real-world decision-making; to improve standardisation and generalisability of research; or to tick boxes to pre-register study protocols? What kinds of climate mitigation actions are in scope, and which are not, and why? Are these guidelines for global or national use? To what extent should we seek to align economic evaluations of the health benefits of climate mitigation actions outside the health sector with those of climate change mitigation actions within healthcare systems? Given the extreme urgency of accelerating action, and the (tragically) still contentious political economy of climate action, focusing on "technical" excellence without first answering these more fundamental questions is a sure route to irrelevance.

Having done so, several critical parameters will then need to be addressed. These include time horizons and intergenerational equity; geographical scope (given that costs and benefits occur over different geographies); evidence sources and methods for (more) standardised estimates of the health impacts of climate actions; and more standardised approaches to valuing these benefits. If done well, guidelines can help to simplify and prioritise effort, coordinate more effective interdisciplinary cooperation, and even move towards better sharing of scarce skills and capabilities in this field. Effective guideline design must navigate between two extremes – ineffectual guidelines under which "anything goes", and which fail to achieve any real standardisation; or excessive standardisation which undermines innovation and promotes simplistic "monkey see, monkey do" analysis which lacks insight or flexibility. Guideline design must also be careful not to confuse the laudable desire for analytical rigour with the longstanding tendency to downplay and minimise "extreme" outcomes and risks which has dogged – some would say fatally undermined – the credibility of economic analysis of the wider societal impacts of climate change.

abs-os761 Green HTA: Redefining Value in Health Care

PRESENTER: **Sarin KC**

The health sector accounts for approximately 5–8% of global greenhouse gas emissions. This alarming finding challenges one of the core ethical principles of healthcare: nonmaleficence, as these emissions drive climate change, which negatively affects health and health systems. The production, supply-chain, use, and waste management of health technologies appear to be a significant contributor to this problem. Therefore, health technologies that are reimbursed under UHC should be both cost-effective and environmentally sustainable to ensure the likely benefits always outweigh the harm. Traditionally, HTA through economic evaluations have helped us define the value of health technologies. However, it only considers economic costs and health benefits, omitting environmental impacts as a value metric. Hence, there is a growing call from the HTA community to develop methods that can adequately incorporate the environmental impacts of health technologies into existing HTA frameworks.

Therefore, we are developing a method, "Green HTA", which involves three steps: (i) estimating the environmental impact of health technologies through product life cycle assessment (LCA) using carbon emission as a proxy; (ii) estimating the economic cost associated with those emissions; and (iii) performing traditional economic evaluation by adding the emissions cost as an additional cost parameter into economic models. We are testing this concept through a case study by comparing the environmental and economic sustainability of peritoneal dialysis and hemodialysis as treatment options for end-stage renal disease in Thailand. For step (i), we are analysing the cradle-to-grave impact of dialysis using the bottom-up approach*.* Data on emissions from the manufacturing process and supply chain are being gathered from Baxter and Fresenius. Emissions related to use of service and patient travel are being collected from dialysis centers across six Thai provinces including Bangkok, Chanthaburi, Chiang Mai, Kanchanaburi, Nakhon Ratchasima, and Nakhon Sawan. Emissions from waste management are being tracked through Bangkok Thanacom, the central agency responsible for managing medical waste. Environmental impact will be analysed using Simapro, with results including total emissions per session of dialysis, annual DALYs, annual loss of species, annual loss of natural resources, and emission hotspots for each dialysis option. For step (ii), we are using the social cost of carbon from the literature, which is the monetised value of the damage to society caused by carbon dioxide. For step (iii), we are using our previous economic evaluation study on dialysis interventions in Thailand. Final results of the study will be presented as emissions per QALY, emissions per cost, emission-adjusted ICER, and a comparison of QALYs gained from dialysis with the DALYs generated by its use.

While our proposed methodology integrates well with existing HTA framework, limited technical capacity and insufficient data for LCA can hinder adoption. Developing and maintaining a medical LCA database will prove critical. For this method to be effectively integrated into policymaking, several gaps must be addressed, including the selection of the most appropriate proxy for environmental impact, defining tolerable emissions threshold, understanding the trade-offs and preference between health gains and environmental sustainability, and potential adjustments to the willingness-to-pay (WTP) threshold.

Methodological Pathways for Valuing Health in Climate Action: Integrating Health Developmental Impacts into Applied Economic Evaluation

PRESENTER: **Dr. Bernard Moscoso, PhD**, ESPOL - Escuela Superior Politécnica del Litoral

Introduction. Climate change presents a growing threat to global health, affecting everything from disease exposure to food security and developmental outcomes. Despite this, health is often inadequately incorporated into economic evaluations of climate policy. Most cost-benefit analyses emphasize mitigation costs and emissions targets while neglecting the dynamic, long-term health effects of climate-related exposures. Recent literature suggests that integrating health, particularly health assessment within a development economics approach into applied economic evaluation, can provide a more accurate and socially solid foundation for policy-making.

Motivation. Emerging studies underscore the importance of early-life health in shaping long-term economic outcomes, yet these effects are rarely internalized in climate economics. For instance, Currie and Almond (2011) show that prenatal environmental shocks can affect lifetime earnings and education. Similarly, Deschênes (2014) and Adhvaryu et al. (2019) link childhood exposure to heat, pollution, rainfall and drought to adverse cognitive and physical development, and education outcomes. Ignoring such pathways leads to underestimating the true costs of inaction. A systematic review by Swinburn et al. (2019) also highlights how climate mitigation policies in energy, transport, and food systems can deliver immediate public health benefits, yet these are seldom valued in economic terms in the literature.

Methods. This review synthesizes recent methodological approaches from health economics, climate policy, and development economics to outline feasible pathways for integrating health into climate-related economic evaluations. Sources include peer-reviewed articles, WHO economic tools, and interdisciplinary models published between 2010 and 2024. Key methods identified include: (1) co-benefit quantification of health outcomes from mitigation policies; (2) integration of developmental health shocks into intertemporal human capital models; and (3) equity-weighted cost-benefit analysis to account for distributional effects.

Results. Across the preliminary reviewed literature, two methodological pathways emerge:

Health Co-Benefits Frameworks: Studies such as Markandya et al. (2018) and Vandyck et al. (2018) show that monetizing health gains—e.g., avoided premature deaths from reduced air pollution—can offset a significant share of mitigation costs. Tools like the WHO's HEAT and the OECD's CIRCLE tool help quantify these benefits.

Developmental Health Impact Modeling: Incorporating early-life exposure effects into economic evaluation, as demonstrated by Fishman et al. (2019), and Maccini and Yang (2009), reveals long-term productivity and educational attainment losses linked to exposure to weather variations, even at early life stages. These models allow policymakers to evaluate the economic returns of preventive health measures in climate-vulnerable regions.

Conclusion. Valuing health in climate action is not only technically feasible but ethically necessary. Integrating developmental health impacts and co-benefits into applied economic evaluations provides a fuller picture of the costs and benefits of climate policies. It also aligns economic decision-making with public health, intergenerational equity, and sustainable development. Furthermore, interdisciplinary methods that bridge climate science, health and development economics, must be scaled and institutionalized to inform robust, health-sensitive climate policies in the short and long-term.

9:00 AM –10:30 AM WEDNESDAY [Health Care Financing & Expenditures]

os243 Bali International Convention Centre – Medan

Evidence to Address the Next Generation Issues Following the Lancet Global Health Commission

MODERATOR: **Kara Hanson**, London School of Hygiene & Tropical Medicine (LSHTM)

CONVENER: **Agnes Gatome-Munyua**, Results for Development

DISCUSSANT: **Cheryl Cashin**, Results for Development

abs-os730 Primary Healthcare Resource Tracking: Strengthening Methods and Supporting Data Use

PRESENTER: **Ms. Anne Mills**

AUTHORS: Manjiri Bhawalkar, Katie Shepard, Rajesh Jha, Cicely Thomas, Parfait Uwaliraye, Ellyana Selamat, Karsten Vrangbæk, Kara Hanson, Anne Mills

Background: Many countries have committed to increasing priority to primary health care, as the foundation for universal health coverage. To design, implement and monitor reforms to strengthen PHC delivery, countries need timely and credible data on PHC resource flows that can be linked to other health system data about services delivered and health outcomes. A range of frameworks, methods, tools and databases have been used globally to collect and analyse information about the flow of health funds. Yet little is known about how individual countries are tracking resources for PHC.

The aim of this paper is to analyse the approaches specific countries are adopting to collect information to track PHC resources, how they are using this information to strengthen the equity and efficiency of PHC delivery, and how best to support and strengthen these tracking systems.

Methods: The study used rapid appraisal case studies in nine countries (Denmark, Ethiopia, India (Bihar State), Indonesia, Malawi, Malaysia, Rwanda, South Africa, Zimbabwe) to understand these issues. Official documents were reviewed and interviews with key stakeholders conducted. Data were consolidated into country analysis tools, capturing details of each country's PHC delivery platforms, health financing arrangements, public financial management (PFM) and resource tracking systems. Cross country thematic analysis was undertaken.

Results: Routine data systems were generally unable to capture flows of resources to PHC; (mis) alignment between the degree of decentralisation of government structures and the financial management information systems was an important influence on data capture. LMICs used a variety of different methodological approaches and tools to track resources, many of which were harmonized in part with Health Accounts framework and exercises. In some countries, resource tracking exercises technically allowed for estimation of PHC spending, but this was not sufficiently prioritised for actual expenditure to be captured and used. Challenges included many that are common to routine health resource tracking, such as difficulties tracking donor-provided in-kind resources, fragmented purchasing and payment systems and flows of domestic funding, resource constraints (e.g., time, institutional capacity) and lack of alignment between the architecture of the public financial management system and health sector financing objectives. Challenges specific to PHC included the variety of operational definitions of PHC and the invisibility of the PHC service delivery level in the budget. Weak accountability structures also impeded PHC tracking and prioritisation.

Conclusion: There are many strong use cases for improved PHC resource tracking. The barriers to improving tracking vary enormously across

country contexts, so no single approach or tool will be sufficient. Where PHC is not trackable within public financial management systems, gathering comprehensive information on resources committed is challenging and impedes further prioritisation of PHC.

abs-os731 Programme-Based Budgeting for Primary Care Financing: Insights for Practitioners

PRESENTER: **Helene Barroy**, World Health Organization

Background: The traditional use of line-item budgeting has negatively impacted the financing of primary care services in low- and middle-income countries (LMICs) by fragmenting expenditures and complicating budget allocation identification, leading to underfunding and accountability issues. In response, many LMICs have adopted programme-based budgeting (PBB) to align budgets with policy priorities. PBB groups inputs around policy goals or outputs, offering greater flexibility and accountability. Health is a priority sector for this reform, with two-thirds of LMICs implementing some form of PBB. However, significant changes to public financial management (PFM) processes and systems have often delayed implementation. Despite its potential, the impact of PBB on primary care financing remains undocumented.

Methods: To address this, WHO conducted a 2023 study analyzing how 20 LMICs integrated primary care financing into their PBB structures. The study reviewed budgetary structures, disbursement rules, and performance-monitoring frameworks.

Results: The analysis revealed that countries had not fully leveraged PBB to enhance primary care financing. National-level PBBs often failed to make primary care more visible or prioritized, while inconsistent budget formulations at subnational levels hindered resource allocation and tracking. Major inputs for primary care (e.g., personnel, vaccines, therapeutics, infrastructure) were often fragmented across different budget lines, leading to inefficiencies. Additionally, rigid disbursement processes and flawed performance-monitoring frameworks limited primary care providers' access to resources and impeded the tracking of primary care outputs.

Conclusion: This paper builds on lessons from the 2023 study, additional evidence from WHO's PFM programme, and consultations with experts within the Montreux Collaborative, to offer insights on more effective approaches for formulating and implementing PBB for primary care. The guidance aims to assist countries in reorienting their health systems towards primary care and aligning their financing arrangements to support primary care more effectively. It covers five key dimensions: national budget structure, subnational budget structure, coverage of costs, disbursement policies, and performance-monitoring frameworks. Through this process, PBB can facilitate system re-orientation, making PFM and health financing reforms more interconnected and mutually reinforcing.

abs-os732 Addressing Fragmentation of Primary Health Care (PHC) Financing for More Equitable, People-Centered PHC

PRESENTER: **Ms. Agnes Gatome-Munyua**, Results for Development
AUTHORS: Prastuti Soewondo, Kara Hanson, Ms. Cheryl Cashin, Ms. Susan Sparkes

Background: Primary health care (PHC) is recognized in global declarations – Alma Ata in 1978 and Astana in 2018 – and is increasingly being prioritized in national health strategies. However, resources directed to primary care remain low, and under-resourcing has been compounded by fragmented and rigid funding flows, which are inefficient and may erode quality of PHC care.

In Indonesia, primary care facilities *Puskesmas* receive funding from three main sources of funding – Ministry of Health, District Health Office and the insurance agency *Badan Penyelenggara Jaminan Sosial Kesehatan* (BPJS-K) each managed separately by the Puskesmas. In this paper we examine the consequences of health financing fragmentation at the system level on fragmentation in the financial flows to PHC providers.

Methods: Indonesia is used as a country example to map funding flows to *Puskesmas* and undertake a bottleneck analysis to identify the obstacles to resources reaching health facilities and the entry points to reduce the fragmentation at facility level. Financial data from the Ministry of Health (including vertical disease programs), sub-national level via the District Health Office, and insurance agency is used to map and track flows to primary care level and describe financial management at the Puskesmas level.

Results: In 2014, multiple public insurance schemes (civil servants, formal sector workers' health benefits and health assistance schemes for the poor) were consolidated under a single pool through the national insurance program *Jaminan Kesehatan Nasional* (JKN) managed by a single insurer BPJS-K. Before 2014, the insurance schemes were managed independently with different benefits and provider payment systems. The move to JKN reduced fragmentation in the funding pools and harmonized the main purchasing functions, meaning that JKN funds flow to providers for services in one unified benefits package, through a single provider payment system. Despite the consolidation in public insurance pools brought about by JKN, funding still flows to PHC providers through multiple (up to five) streams to fund different sets of PHC services or inputs and with different financial management rules, which continues to undermine the coherence of the health financing system and undermine PHC delivery.

Conclusion: The merger of public health insurance schemes to create JKN, was helpful in reducing fragmentation in the insurance system but did not resolve the fragmentation from the other sources of PHC financing. This can impact financial management and service delivery if providers are not able to use funds flexibly across the different sources . This means there is more to be done to address fragmentation in the government budget flows as an unfinished agenda.

abs-os734 A Framework for Understanding and Improving the Financing of Primary Health Care (PHC) Commodities with an Application to Ethiopia

PRESENTER: **Yewedalem Tesfaye**
AUTHOR: Ms. Cheryl Cashin

Background: Access to essential medicines is an integral part of universal health coverage (UHC), and primary health care (PHC) plays a crucial role in delivering both health services and medicines. While medicines make up a large share of total spending on PHC--sometimes as high as 40–50% of all expenditure and often paid for out-of-pocket through private pharmacies—the Lancet Global Health Commission on Financing Primary Health Care found that there is very little evidence about how medicines are financed end-to-end through government systems. There is tremendous scope to leverage financing policy tools to address the many challenges related to access to medicines at the PHC level such as frequent stock-outs in public health facilities and the high level of out-of-pocket payments for medicines purchased in private pharmacies, representing a substantial barrier to the use of medically appropriate and high-quality medicines. One factor limiting the evidence on improving financing of medicines at the PHC level is a lack of understanding of the different ways PHC financing is organized at the country level from procurement and supply chain systems to PHC providers and patients, and how the financing of PHC medicines is incorporated into health financing policy levers such as revenue generation, pooling, and strategic purchasing.

Methods: Results for Development developed an analytical framework to describe systems for financing PHC commodities and how these financing systems interact with procurement and supply chain systems and broader health financing policy in the country. This framework was applied to the case of Ethiopia to describe the flow of funds and commodities directly from the government budget to the procurement agency Ethiopia Pharmaceutical Supply Service, and indirect channels to PHC facilities and patients through Community-Based Health Insurance (CBHI) and social health insurance managed by the Ethiopia Health Insurance Service (EHIS).

Results: Ethiopia is facing declining donor funding for family planning and MNCH commodities. A list of "fee-exempted services" (MCH, TB / HIV / malaria, and family planning) has historically been fully funded by the government and donors, and provided free of charge at all levels of the health system. Donors have been decreasing their support for the commodities needed to deliver these services, requiring a larger domestic role in financing and procurement. The threat of decreased funding for essential commodities prompted a discussion about sustainable financing, and an effort to prioritize the services, and associated commodities, that should continue to be provided to the population free of charge. At the same time the Community-Based Health Insurance Scheme is losing subscribers as covered individuals are unable to use their cards to obtain prescribed medicines due to stock-outs at public facilities.

Conclusion and implications for policy: The results of the mapping analysis suggests opportunities to harmonize the financing of PHC medicines through the direct and indirect channels through, for example, harmonized benefits entitlements, incorporating medicines financing into provider payments in the CBHI and EHIS systems.

9:00 AM –10:30 AM WEDNESDAY [Economic Evaluation Of Health And Related Care Interventions]

os55 Bali International Convention Centre – Hibiscus

Improving the Evidence Base on the Cost-Effectiveness of Interventions to Address Neglected Tropical Diseases

MODERATOR: **Jacob Kazungu**, KEMRI Wellcome Trust Research Program

CONVENER: **Olimpia Lamberti**, London School of Hygiene and Tropical Medicine

abs-os47 A Systematic Review of Economic Evaluations for Neglected Tropical Diseases of the Skin

PRESENTER: **Iris Penny Mosweu**, London school of Hygiene & Tropical Medicine
AUTHORS: Catherine Pitt, Purity Nyaikamba, Lucas Sempe, Yohannes Hailemichael, Sandra Ndongwe, Yaw Amoako, Jacob Novignon, Michael Marks, Lucy Owusu

One-fifth of the world's population required individual or mass treatment for neglected tropical diseases (NTDs) in 2022. Affecting people across all continents, NTDs impose a substantial morbidity, mortality, and cost burdens on affected households, communities, and health systems. Many NTDs, notably those affecting the skin, are also associated with stigma and social exclusion. NTDs disproportionately affect the poorest and most marginalised people, and exacerbate health and social inequities; they are therefore considered important tracers of equity in health systems. Sustainable Development Goal 3.3 targets an "end" to the NTD "epidemic," but progress is off track. NTDs receive less funding for research and programme implementation than diseases with much smaller burdens, and NTD programme priorities have long been influenced by drug donation programmes. The World Health Organization now recommends integrated strategies to target multiple NTDs simultaneously, but evidence is needed to support intervention choices, particularly regarding the costs and efficiency of alternative approaches. Previous reviews of skin NTD economic evaluations are increasingly out of date; did not include robust critical appraisal; and did not assess skin NTDs as a group, making it difficult to draw conclusions regarding the economics of integration. We systematically reviewed economic evaluations for 11 skin NTD to inform current policy debates and guide future skin NTD economic evaluations.

We searched 13 electronic databases in July 2024 using a pre-defined strategy to identify peer-reviewed, full economic evaluations and cost analyses published since January 2000. Six reviewers working in pairs independently screened records based on pre-defined eligibility criteria and categorised all included studies. Four reviewers double-extracted detailed data from full economic evaluations to assess methodological quality and to describe methods and results. Methodological quality was assessed using both the Consolidated Health Economic Evaluation Reporting Standards (CHEERS) and also the International Decision Support Initiative (IDSI) reference case. We report findings in accordance with PRISMA guidelines and analyse data using descriptive statistics and narrative synthesis. The protocol was registered on PROSPERO (2022 CRD42022350844).

From 3,723 records screened, we identified 151 skin NTD economic evaluations: 42 full economic evaluations, 73 (47%) intervention cost (only) studies, and 36 cost-of-illness or economic burden (only) studies. Most evaluations studied countries in Africa (n=60, 40%) Asia (n=52, 34%), or the Americas (n=29, 19%). The full economic evaluations adhered, on average to <50% of CHEERS and <15% of IDSI items, indicating overall very low quality (with some exceptions); most concluded that new, usually more expensive interventions would be cost-effective, often based on inappropriately high (or no) thresholds.

We found skin NTD economic evaluations to be of inconsistent quality and usually focused on individual diseases, which limits their usefulness for priority-setting. Nonetheless, important commonalities and differences emerged across skin NTDs. Future economic evaluations should draw on existing evidence where possible, while ensuring adherence to methodological standards, to ensure validity and usefulness of results. Full economic evaluation of integrated strategies remains an important gap.

abs-os379 Cost and Cost-Effectiveness of Home-Based Self-Sampling and Clinic-Based Sampling for Screening of Female Genital Schistosomiasis in Zambia

PRESENTER: **Olimpia Lamberti**, London School of Hygiene and Tropical Medicine
AUTHORS: Helen Ayles, Amaya Bustinduy, Helen Kelly, Nkatya Kasese, Fern Terris-Prestholt, Kwame Shanaube, Jennifer Fitzpatrick, Rhoda Ndubani, Fiammetta Bozzani

Introduction: Female genital schistosomiasis (FGS) is a neglected gynaecological disease affecting 45 million women in sub-Saharan Africa, particularly in rural areas with poor water and sanitation. FGS is associated with increased prevalence of HIV and cervical precancer. There are no organised screening programmes for FGS, and its burden is not included in the global burden of disease study. Clinic-based point-of-care colposcopy by a midwife is the standard screening for FGS, but it requires expensive equipment and specialised training, seldom available in endemic settings. Self-collected genital samples ('self-sampling') can be collected during community health workers outreach, potentially overcoming some of the health system constraints associated with colposcopy. We evaluate the cost-effectiveness of home-based self-sampling and clinic-based sampling, compared to a no-screening approach, using data from the Zipime-Weka-Schista study in Zambia.

Methods: We combined a decision tree for FGS screening strategies, with a Markov model for the natural history of cervical cancer. The decision tree simulates the accuracy of home-based self-sampling and clinic-based sampling for FGS screening. Individuals then transition to the health state corresponding to their status in the Markov model. For each strategy, we estimated the FGS screening costs per woman screened, the disability-adjusted life years (DALYs), and incremental cost-effectiveness ratios (ICERs) from a societal perspective. Model parameters were obtained from the Zipime-Weka-Schista study and the published literature. Disability weights for FGS were derived by combining weights from similar conditions in the 2019 GBD study and cervical cancer DALYs from the Markov model. We analysed different intervention scenarios, varying screening frequency and coverage across rural and peri-urban populations. Expansion paths were used to identify optimal combinations of home-based self-sampling and clinic-based screening. A lifetime time-horizon was considered, with costs and outcomes discounted at 3% annually, presented in 2021 United States dollars.

Results:FGS screening using a home-based self-sampling approach costs $7.7 per woman screened, while clinic-based sampling approach costs $11.9. Under the base-case assumption of 70% screening coverage every five years, home-based self-sampling was more effective and cost-effective than clinic-based sampling (ICERs $1,380 and $17,560 per DALY averted, compared to do-nothing approach). Home-based self-sampling had >80% probability of being cost-effective at a threshold of >$3,000 per DALY averted. Implementing home-based self-sampling every five-years for women aged 15-30 years in rural areas, with a 90% screening coverage, was found to be highly cost-effective at $480 per DALY averted. A combined screening pathway incorporating home-based self-sampling in rural (80% coverage) and clinic-based screening in peri-urban areas (20% coverage) was valued at US$661 per DALY averted. This pathway would be considered very cost-effective under conservative thresholds (0.5 GDP< $728/DALYs).

Conclusion: Home-based self-sampling for girls and women aged 15-30 years living in high FGS prevalence areas is a cost-effective strategy for FGS screening in Zambia. With the growing interest in decentralising strategies for FGS screening, home-based self-sampling offers an effective approach.

abs-os392 Cost-Effectiveness of High-Dose Versus Standard-Dose Rifampicin for the Treatment of Buruli Ulcer: a Full Economic Evaluation Within a Trial in Ghana

PRESENTER: **Jacob Novignon**, Kwame Nkrumah University of Science and Technology
AUTHORS: Steven Walker, Yohannes Hailemichael, Abigail Agbanyo, Catherine Pitt, Richard Phillips, Yaw Amoako, Dorothy Yeboah-Manu, Michael Marks, Richard Adjei Akuffo

Background

Buruli Ulcer (BU) is a neglected tropical disease prevalent across many countries, particularly in West Africa. Without effective treatment, it can lead to life-long disability and deformities, creating substantial health and economic burden. Standard treatment with rifampicin (SR) and clarithromycin for 8 weeks can clear viable mycobacterium from wounds, but higher dose rifampicin (HR) may improve outcomes and permit shortening of treatment regimes. Treatment choices should reflect their effectiveness and efficiency, but little is known about the costs of experiencing or treating BU or the cost-effectiveness of alternative treatment regimes. We aimed to evaluate the costs and cost-effectiveness of HR vs. SR treatment for BU within a multicentre, individually randomized controlled trial at two hospitals in two regions (Eastern and Western) in Ghana.

Methods

Patients were enrolled in the trial from November 2021 until 31 July 2024. The primary trial outcome was assessed at four months from treatment initation, with follow-up of health outcomes and costs for 1 year where possible. Demographic, economic, and clinical data were collected from patients at enrolment and follow up points, health facilities (reflecting cost of treatment resources used) and project administrative data. Effectiveness was measured using quality-adjusted life-years (QALYs) with data collected using the EQ-5D-5L tool, disability-adjusted life-years (DALYs) and clinical scores. We present the cost per patient to the household and to the health service, and explore variation across socio-demographic characteristics, clinical disease stages, wealth, and trial arm. We examine the incremental cost per QALY gained and per DALY averted of HR vs. SR groups based on intention-to-treat analyses. Univariate and probabilistic sensitivity analysis was conducted to assess the impact of uncertainty and heterogeneity on cost-effectiveness results. All costs were inflated to 2024 values and converted to United States dollars.

Results

Forty two patients have been enrolled with no lost to follow up. Premilinary findings suggest an overall average cost of US$587. Disaggregating this indicate slightly lower average cost for the HR arm (US$551) compared to the SR arm (US$630). The key cost drivers include wound dressing materials and drugs costs. We also found improvements in quality of life across both arms between baseline and endline with higher average utility scores in the HR arm compared to the SR arm. The average utility score was 0.663 and 0.570 at baseline for HR and SR arms, respectively and this increased to 0.938 and 0.878 at endline for the two arms respectively. Additional effectiveness indicators including DALYs and clinical scores are currently being analysed, and an incremental cost effectiveness ratios (ICER) per effectiveness measure will be computed to determine which intervention arm is cost-effective.

Conclusion

Given the substantial health and economic burden of BU disease on households and the health services, our study provides important evidence to inform efforts to scale up cost-effective treatment interventions to improve BU treatment outcomes.

abs-os401 Cost-Effectiveness of RDTs for the Detection of *Trypanosoma Cruzi* Infections in Endemic Areas

PRESENTER: **Iris Lopes-Rafegas**, ISGlobal, Hospital-Clínic-Universitat de Barcelona
AUTHORS: Francesco Ramponi, Joaquim Gascon, Julio Alonso-Padilla, Albert Picado, Lourdes Ortiz, Elisa Sicuri, Faustino Torrico, Maria Jesus Pinazo

Background: Chagas disease (CD) is a vector-borne parasitic disease included in the World Health Organisation's list of neglected tropical diseases. It is caused by the *Tripanosoma cruzi* parasite. Despite being endemic to various regions of Latin America, its prevalence and associated morbidity and mortality remain largely unknown mainly due to scarce investment in efficacious health products, including diagnostic tools. Serology, the main diagnostic strategy in practice, has good performance but it requires lab equipment and capacities that are rarely available where the prevalence is likely to be highest, in rural and poor areas. As a result, the infection is under-detected, and when it is detected, the long time lapse between screening and obtaining the results is likely to reduce linkage to parasitic treatment.

Objectives: We model the cost-effectiveness of diagnostic strategies based on (new) rapid diagnostic tests (RDTs) only, RDTs combined with serology, and serology only as the comparator, for the detection of *Tripanosoma cruzi* in endemic areas.

Methods: We built a decision tree with a Markov model that represents the natural history of the disease. We represent health outcomes using Quality-Adjusted Life Year (QALYs) derived from a primary health-related quality of life data collection undertaken in Bolivia. Conservatively, we assumed most of the parameters to be equal between serology and RTDs and we carried out threshold analyses allowing us to estimate at which values of key parameters such as the linkage to care proportion of positive cases, RDTs would be more cost-effective than serology.

Results: Serology and the mixed strategy dominated the strategy based on RDTs only in our conservative scenario and, *ceteris paribus*, the incremental probability of linkage to treatment would need to reach 50% for the ICER to be as low as 4,000 USD, roughly the Gross Domestic Product (GDP) per capita of Bolivia, per QALY gained, for RDTs to be more cost-effective than serology.

Conclusions: RDTs are certainly key tools to improve the detection and the subsequent management of CD in endemic countries. However, more research is needed to understand the benefits of RDTs over serology and the possible scenarios for their implementation.

9:00 AM –10:30 AM WEDNESDAY [Health Care Financing & Expenditures]

os66 Bali International Convention Centre – Singaraja

Actuarial and Financial Modeling for Universal Health Coverage: A Case Study of the World's Largest Single-Payer System

MODERATOR: **Manuela De Allegri**, University of Heidelberg

CONVENER: **Budi Hidayat**, Center for Health Economics and Policy Studies, Universitas Indonesia

abs-os65 Actuarial and Cost Models for Universal Health Coverage within the SHI Framework

PRESENTER: **Arif Budiman**, BPJS Kesehatan
AUTHORS: Budi Hidayat, Mahlil Ruby, Royasia Viki Ramadani, Taufik Hidayat, Thomas Hone, Judite Gonçalves, Christopher Millett

Background: Social Health Insurance (SHI) systems face significant challenges in ensuring financial sustainability under Universal Health Coverage (UHC). While SHI claims data are primarily used for invoicing, they also offer valuable insights for financial forecasting, pricing, and policy decisions. However, a gap exists in the literature regarding comprehensive actuarial cost models (ACM) that assess the long-term financial impacts of policy changes on SHI revenues and expenditures. This study develops an ACM to project the financial implications of both status-quo and policy-change scenarios for SHI systems.

Research Aim: This study aims to develop an ACM to forecast the financial impact of policy changes within the SHI framework. Specifically, it seeks to: 1) assess the financial state of SHI under the status quo; 2) evaluate the effects of policy changes, including cost-sharing and strategic purchasing, on long-term sustainability; and 3) provide actionable insights for improving SHI financing.

Methods: Two versions of the ACM are developed: the Basic ACM (BAM) and the Extended ACM (EAM). The BAM projects future costs based on historical claims data, including member-months, utilization rates, provider-billed costs, and medical loss ratios. The EAM builds on the BAM by incorporating policy parameters, such as cost-sharing and strategic purchasing, to evaluate their impact on future costs while adjusting for changes in patient and provider behavior. Both models are applied to Indonesia's JKN claims data from BPJS, covering January 2021 to June 2024. The dataset includes membership details, claim frequency, and provider-billed costs, categorized by member group and benefit type (e.g., primary and secondary healthcare services).

Key Findings: Preliminary results from the BAM indicate that JKN has faced a cash deficit since 2023, projected to continue through 2027. Despite deficits, JKN has been able to pay benefits using the Social Security Fund (DJS), established in 2021. Surpluses of IDR 45 trillion (USD 2.86 billion) and IDR 22 trillion (USD 1.4 billion) in 2021 and 2022, respectively, raised the DJS to IDR 68 trillion (USD 4.31 billion). However, a 2023 deficit of IDR 15.6 trillion (USD 991.4 million) reduced the DJS to IDR 52 trillion (USD 3.3 billion). Projections suggest that by 2027, the DJS could turn negative, with the claims ratio possibly reaching 109%. This would lead to annual deficits ranging from IDR 11 trillion (USD 698 million) to IDR 23 trillion (USD 1.46 billion), with a shortfall of IDR 18 trillion (USD 1.14 billion) by 2027.

Conclusions and Implications: This study underscores the importance of actuarial modeling in assessing the financial sustainability of SHI systems. The findings highlight the need for reforms, such as strategic purchasing and cost-sharing, to ensure long-term financial viability. Policymakers can use the BAM and EAM to evaluate the impact of policy interventions, guiding the development of health financing strategies that balance SHI sustainability with equitable access to healthcare.

abs-os67 Designing and Evaluating Cost-Sharing Policies for the Sustainability of JKN in Indonesia: An Actuarial and Financial Modeling Approach

PRESENTER: **Mahlil Ruby**
AUTHORS: Examinar Examinar, Donni Hendrawan, Pujiyanto Pujiyanto, Zahrina Laborahima, Atik Nurwahyuni, Budi Hidayat, Atmi Roseva, Mahlil Ruby

Background: In Indonesia, the Jaminan Kesehatan Nasional (JKN) system is grappling with rising healthcare costs, highlighting the urgent need for cost containment and quality assurance strategies, including a series of strategic health purchasing policies. While cost-sharing mechanisms are allowed under JKN, they have yet to be implemented, and hence their potential impact on the Social Security Fund (DJS) remains largely unexplored. This study aims to fill this gap by developing and evaluating several cost-sharing models to assess their effects on JKN's financial sustainability and long-term viability.

Research Aim: The study aims to develop different cost-sharing policies and evaluate ther potential impact on JKN financial status. Specifically, it seeks to (1) assess JKN's financial status without cost-sharing, (2) evaluate the impact of various cost-sharing models on JKN's sustainability, and (3) provide recommendations for policymakers on the optimal implementation of cost-sharing strategies.

Methods: This study employs two advanced actuarial models—the Basic Actuarial Model (BAM) and the Extended Actuarial Model (EAM). The BAM evaluates the financial health of JKN using historical claims data from BPJS Health (January 2021 to July 2024) under the current policy framework. In contrast, the EAM integrates a range of cost-sharing strategies, including copayments and coinsurance, across multiple scenarios: Base, Exclusion, Combination, and Selected models. These models differ in terms of which benefits and member groups are subject to cost-sharing, as well as the specific cost-sharing amounts. The EAM then analyzes the financial impact of these strategies on JKN's claims ratio, cash deficit, and DJS status, providing key insights into the sustainability of JKN's financing structure.

Key Results: Preliminary findings show that without cost-sharing, JKN is projected to face significant deficits, with the DJS potentially turning negative by 2027. Among the cost-sharing models, the SELECTED model—featuring a copayment of IDR 154,000 (USD 9.8) per outpatient visit and 20% coinsurance for inpatient services—substantially reduces the annual deficit, saving IDR 2.74 trillion (USD 175 million) in 2025. However, JKN is still expected to face a deficit of IDR 6.51 trillion (USD 417 million) by 2027, with the claims ratio consistently exceeding 100%.

Conclusions and Policy Implications: The results demonstrate that cost-sharing mechanisms, particularly the SELECTED model, can improve JKN's financial sustainability by reducing deficits. However, even with cost-sharing, JKN is unlikely to fully eliminate its financial shortfall. Policymakers should consider combining cost-sharing with other strategies to maintain the DJS's solvency. Clear regulatory frameworks and a robust management information system (SIM) are essential for monitoring and adjusting cost-sharing policies. Ongoing stakeholder engagement and regular evaluations will be key to ensuring that these mechanisms effectively balance cost control with financial protection for

JKN participants.

abs-os69 Determining SHI Contribution Levels: Integrating Strategic Health Purchasing, PMPM Costs, and Wage-Based Contributions

PRESENTER: **Royasia Viki Ramadani**
AUTHORS: Judite Gonçalves, Budi Hidayat, Thomas Hone, Christopher Millett

Background: Indonesia's National Health Insurance (JKN) faces persistent financial challenges, with rising cash deficits since 2023. The Social Security Fund (DJS) is projected to become insolvent by 2027 without policy intervention. While medical claim costs have surged, contribution revenues have not kept pace, threatening the program's sustainability. This study explores optimal JKN contribution rates and evaluates the impact of increasing benefit prices and implementing cost-sharing mechanisms to improve financial solvency.

Research Aim: The study aims to determine necessary adjustments to JKN contribution rates and assess the combined impact of increasing SHI benefit prices and the SELECTED cost-sharing model on JKN's sustainability for 2026–2027.

Methods: Actuarial and financial modeling are used to project health claim costs under the status quo and various policy scenarios, including increased SHI benefit prices, cost-sharing (copayments for outpatient visits and coinsurance for inpatient services), and strategic health purchasing policies. The study forecasts financial outcomes through 2027, offering recommendations for adjusting contribution rates for formal sector workers and subsidy levels for health insurance group members.

Key Results: The analysis shows a widening gap between medical claim costs and contribution revenues for JKN from 2022 to 2027. In 2022 and 2023, claim costs rose by 29% and 36%, while contribution revenues grew by less than 5%. Without policy changes, JKN is projected to face rising deficits, with the DJS potentially turning negative by 2027. The SELECTED cost-sharing model could reduce the annual deficit by IDR 2.74 trillion (USD 175 million) in 2025, but a deficit of IDR 6.51 trillion (USD 417 million) is still expected by 2027. To maintain solvency, JKN contributions should increase to IDR 88,100 per person per month (PMPM) for 2026–2027, with PBI participant contributions rising by 55% to 67%.

Conclusion and Policy Implications: To ensure JKN's long-term sustainability, it is critical to raise contribution rates, implement cost-sharing mechanisms, and adjust SHI benefit prices. While the SELECTED model helps alleviate financial pressure, ongoing reforms—including regular contribution increases and cost-sharing adjustments—are necessary. Policymakers should prioritize revising the Presidential Regulation on JKN contributions and consider the financial implications of benefit pricing to secure the DJS's solvency and JKN's viability in providing universal health coverage.

abs-os68 Evaluating the Impact of New SHI Benefit Pricing on Sustainability: An Actuarial and Financial Modeling Approach

PRESENTER: **Atik Nurwahyuni**
AUTHOR: Budi Hidayat

Background: Indonesia's National Health Insurance (JKN) program, a key component of the country's UHC policy, faces significant financial challenges as healthcare costs continue to rise. A major cost driver within the JKN scheme is the INA-CBGs (Indonesian Case Based Groups) spending, which absorb more than 85% of total JKN claims. Given these growing financial pressures, it is crucial to reassess the formulation of INA-CBGs tariffs to ensure they accurately reflect patient care costs. Recent innovations in costing methods aim to improve data quality and introduce more granular cost components, which are essential for generating accurate cost indicators and supporting the program's long-term sustainability.

Research Aim: This study aims to evaluate the potential impact of revised INA-CBGs tariffs, incorporating these innovative costing methods, on the JKN financial sustainability. It also explores how cost-sharing models, such as the SELECTED model, could help mitigate deficits and maintain the solvency of the Social Security Fund (DJS).

Methods: This study uses Actuarial Cost Model (ACM), including both the Basic Actuarial Model (BAM) and the Extended Actuarial Model (EAM), to simulate the financial effects of revised INA-CBGs tariffs with new costing methodologies. These methodologies focus on improving billing quality and cost data accuracy, including detailed breakdowns of direct and indirect hospital costs and the application of cost weights for more accurate procedure cost allocations. The EAM integrates these revised cost data with projections of future healthcare claims, claims ratios, and cost-sharing mechanisms (Study #2). While final simulation results are still pending, the model provides valuable insights into how tariff revisions and cost-sharing affect JKN's financial sustainability, aiding decisions on adjusting contribution levels.

Key Results: Preliminary findings from the BAM indicate that JKN has faced a cash deficit since 2023, with deficits projected to continue through 2027. Although the Social Security Fund (DJS) has been able to cover benefits using surpluses from 2021 and 2022, the DJS is expected to decline significantly by 2027, with estimated deficits ranging from IDR 11 trillion (USD 698 million) to IDR 23 trillion (USD 1.46 billion). The SELECTED cost-sharing model helps reduce the deficit, but the DJS will still face a shortfall, though smaller compared to the no-cost-sharing scenario. Additionally, implementing new SHI benefit pricing, such as a percentage increase in INA-CBGs prices, will inevitably raise JKN spending, further straining the fund.

Conclusion and Policy Implications: While the introduction of cost-sharing mechanisms can mitigate JKN's financial deficits, increasing INA-CBGs tariffs poses a significant risk to its sustainability. These measures alone will not guarantee long-term financial stability. Without an increase in contribution rates, JKN will continue to face mounting financial pressure from rising medical claims. The findings highlight the

urgent need for a comprehensive strategy to safeguard JKN's financial future. Policymakers must carefully assess the combined impact of INA-CBGs tariff adjustments and cost-sharing mechanisms when determining future contribution levels. The results from the EAM offer critical insights to inform decisions on adjusting contribution rates, ensuring the solvency of the Social Security Fund (DJS), and securing JKN's long-term viability.

9:00 AM –10:30 AM WEDNESDAY [Supply And Regulation Of Health Services And Products]

os67 Bali International Convention Centre – Bougainville

How Effective is Managed Competition in Health Insurance? - Evidence from Medicare Advantage

MODERATOR: **Michael E. Chernew**, Harvard University

CONVENER: **Joseph G.P. Hnath**, Harvard University

DISCUSSANT: **Randall P Ellis**, Boston University, Department of Economics; **Bianca Frogner**, University of Washington Center for Health Workforce Studies

abs-os66 Competition and Entry in Medicare Advantage

PRESENTER: **Joseph G.P. Hnath**
AUTHORS: J. Michael McWilliams, Mr. Michael E. Chernew

Introduction ** The Medicare Advantage (MA) program enrolls 30 million beneficiaries with annual government expenditures surpassing $400B – a figure that is projected to continue increasing. A key component of the program is competition among firms to reduce prices and improve benefits. Initially, Medicare policy incentivized participation in MA by offering generous payments to plans, which helped establish markets where none existed or where offerings were limited. Early research on this phase found that more competitive markets passed through a greater share of these payments to beneficiaries.

However, the MA landscape has evolved significantly since the last studies on pass-through effects only as recently as 2011. Since then, MA enrollment has more than doubled, and plan bid rebates have increased by about 50%. Given these changes, it is crucial to reassess how competition affects plan bids in today's MA markets. Our research question is to determine the causal effect of additional competitors in MA markets on plan bids.

Methods * *We use publicly available data on MA plan offerings, bids, and enrollment. Since bids are made at the plan level, we aggregate the average number of competitors across markets where each plan is offered rather than conducting a market-level analysis. To identify causal effects, we employ the *Difference-in-Differences for Continuous Treatments* method developed by de Chaisemartin *et al.*, controlling for the average market benchmark rate. The primary outcome is the plan bid rebate, and the treatment variable is the average number of competitors in relevant markets.

Results ** From 2016 to 2021, the average number of competitors that MA plans faced increased from 5.8 to 7.5, although some plans experienced changes as large as losing 7.7 competitors or gaining 6.0 competitors. The preliminary results from our difference-in-differences analysis show a precisely estimated null effect for each additional competitor on plan bid rebates ($0.29; 95% CI: -$1.40, $1.99), with a sample mean rebate of $103. When focusing on the five largest national MA insurers (UnitedHealthcare, Humana, Aetna, Elevance, and Blue Cross Blue Shield affiliates), results are noisier but consistent with the overall findings. Economic theory suggests that entry effects would be more pronounced in less competitive markets; however, even in markets with below-median baseline competition, we find economically small effects (-$2.77; 95% CI: -$5.57, $0.02). Similar results hold when focusing on the aforementioned national insurers. Ongoing analyses explore mergers, competitor exits, and market-level analyses.

Conclusion ** Our findings suggest that firm entry does not lead to reductions in MA rebates, as we might expect if there were increases in competition. This may indicate diminishing returns from payment generosity in stimulating competition. More broadly, our study contributes to understanding how managed competition functions in health insurance markets and informs policy on market participation incentives.

abs-os673 Fewer, Shorter, Cheaper: Perioperative Costs of Elective Surgeries in Medicare's Private Managed Care Plans vs. Traditional Fee-For-Service Medicare

PRESENTER: **Eran Politzer**, Harvard University
AUTHORS: Timothy S. Anderson, John Ayanian, Bruce Landon, Vilsa E. Curto, Jeffrey Souza, Thomas Tsai, Alan Zaslavsky

Background

U.S. Medicare beneficiaries can enroll in private managed care health plans under the Medicare Advantage (MA) program or remain in the traditional fee-for-service Medicare (TM). Although elective surgery utilization rates are known to be lower in MA than in TM, it remains unclear whether the costs of surgical episodes also differ between the two programs for comparable MA and TM patients. This study investigates cost, efficiency, and outcome differences in surgical episodes between MA and TM, highlighting mechanisms by which managed care plans may achieve cost savings.

Methods

Using 2019 TM claims and MA encounter data, this retrospective cohort study compares costs, markers of efficiency, and outcomes of surgical episodes for MA and TM patients. The main outcomes included estimates of 30-day costs of surgical episodes and factors affecting those costs: the share of inpatient procedures, length of stay, share of patients discharged home, and readmission rates. Age- and gender-standardized surgery rates were calculated and 30-day mortality rates were examined as a balancing quality measure. Multivariable linear regression models were used to estimate differences in outcomes between MA and TM, controlling for surgery type, patient characteristics, Elixhauser comorbidity index, and hospital referral region. To differentiate cost differences arising from selection of hospitals and facilities into MA networks versus differential outcomes within the same facility, an additional specification included a fixed effect for the facility where the procedure was performed.

Results

The study analyzed 1.17 million procedures across 11 categories of common elective surgeries that could be performed in either inpatient or outpatient settings. The overall rate of surgery utilization was 4.4% (95% CI: 4.1 – 4.8) lower in MA than in TM, with variation by surgery category. Across procedures, 30-day costs of surgical episodes were on average lower in MA by 1.4% ($345, CI:$322 - $369). MA also had 8.6% (5.4 percentage points (pp), CI: 5.2 - 5.6) lower share of procedures billed at the higher inpatient rate, 6.4% (0.27 days, CI:0.26 -0.29) shorter length of stay in inpatient stays, and a 6.2% (3.8 pp, CI:3.7 – 4.0) higher share of patients discharged home. There was no significant difference in 30-day mortality rates between MA and TM. Seventeen percent of the lower cost in MA was attributed to between-facilities variation.

Conclusions

In addition to lower utilization of common elective surgeries, our results indicate that MA plans achieved lower surgical episode costs compared to TM by shifting procedures from inpatient to outpatient settings, shortening lengths of stay, and avoiding expensive post-acute care. These cost-saving strategies were not correlated with a significant increase in mortality, indicating efficiency gains without compromising patient outcomes. Our estimates indicate that steering patients to specific facilities also played a role in the observed results.

abs-os672 Nursing Homes as Insurers? Provider-Insurer Integration in US Nursing Homes

PRESENTER: **Amanda Chen**
AUTHORS: Michael McWilliams, Mary Beth Landrum, David C. Grabowski

Introduction

Institutional Special Needs Plans (I-SNPs) are a type of Medicare Advantage (MA) plan that allow insurers in MA to differentiate their benefits exclusively for long-term residents of nursing homes in the United States. When I-SNPs were first offered in 2006, the early I-SNP models were insurer-led as the plan was primarily at-risk for long-stay residents' Medicare spending. Today however, nursing homes have increasingly been entering the I-SNP market with I-SNP models differentiated based on the level of risk borne by the insurer and nursing home. When nursing homes offer a provider-led I-SNP, one might expect changes in both enrollment and the quality of care provided. As a result, our research aims to compare differences in enrollment and outcomes between long-stay residents who receive care in nursing homes with a provider-led I-SNP (treated) to long-stay residents who receive care in nursing homes with other types of I-SNPs or nursing homes without I-SNPs (untreated).

Methods

This study leveraged Medicare claims and the Minimum Data Set which provided data on the Medicare long-stay nursing home population from 2004 to 2021. Following the approach of Callaway and Sant'Anna (2021) to address heterogenous treatment effects with staggered treatment times, we used a difference-in-differences design to understand how greater nursing home involvement in the administration and operation of an insurance plan may lead to shifts in I-SNP enrollment. Additionally, because the incentives may differ between nursing homes that have greater risk sharing and stronger financial incentives, we assessed the effect of provider-led I-SNPs on facility-level outcomes, including hospitalizations, medication use, pressure ulcers, physical restraints, falls and mortality.

Results

Using Medicare claims and resident assessments from 2004-2021, we found that the offering of a provider-led I-SNP at a facility led to a 17.0 percentage point increase in I-SNP enrollment among facility residents within four years relative to control nursing homes. We also estimated that offering provider-led I-SNPs significantly decreased hospitalizations and increased the use of hypnotic drugs and reporting of pressure ulcers by nursing facilities. Relative to the baseline mean among treated nursing homes, we found relative declines of 18.2% for hospitalizations and increases of 30.3% for hypnotic drug use and 15.6% for pressure ulcers.

Conclusion

I-SNPs are responsible for a small, but growing, share of insurance among Medicare long-stay nursing home residents. These arrangements between a nursing home and insurer to administer an I-SNP designed to care for the needs of its long-stay population can allow provider-led I-SNP nursing homes to integrate both a tailored clinical and financial model which align their aims to improve cost, quality, and service. Our results suggest that risk bearing by nursing homes in the form of provider-led I-SNPs may successfully reduce utilization, but with unclear implications for quality and competition.

os84 Bali International Convention Centre – Bandung

Pharmaceutical Markets, Policies, and Innovation

MODERATOR: **Jianan Yang**, Peking University

DISCUSSANT: **Lucy Xiaolu Wang**, University of Massachusetts Amherst

abs-os101 Competition in Pharmaceutical Markets: Evidence From the National Centralized Procurement in China

PRESENTER: **Julie Shi**
AUTHOR: Hanyang Li

Many studies have focused on competition in the pharmaceutical market. While the literature primarily focus on the upstream pharmaceutical market, that is, the competition between brand and generic drugs, the competition in the downstream pharmaceutical market receives little attention. Specifically, the research focusing on the drug competition between health care providers and retail pharmacies is extremely rare. Unlike developed countries in which pharmacies serve as the main channel for drug sales, health care providers play an essential role in drug retailing in many developing countries, such as China, India and Nigeria. Therefore, studies concerning the competition between providers and pharmacies in the pharmaceutical retail market is of great importance.

In this paper, we investigate the impact of competition on drug prices between medical providers and pharmaceutical retailers in China. Since 2019, the Chinese government has implemented a policy of centralized procurement on drugs and involved competitive bidding on their prices, which led to a huge price reduction. While this policy mainly applied on drugs in public hospitals, it is unclear how it affects the drugs prices sold at retail pharmacies. From the one hand, hospitals and pharmacies are competitors with each other in providing drugs to patients, so price reduction on one channel would make pressure to the other, and drugs prices in pharmacies tend to go down. From the other hand, however, if the two markets are highly segmented, the prices of drugs in the pharmacies may not be affected. More importantly, if the centralized procurement caused supply shortage or quality deterioration on drugs in public hospitals, the price of drugs sold at pharmacies may even increase. Therefore, the impact of the centralized procurement on drug prices at pharmacies remains an empirical question.

Using data from an online drug retailing platform, we explore the impact of the reduced drug prices in public hospitals on those at retail pharmacies. We find that the price of drugs with the same generic names as those that participated in the centralized procurement reduced by 16.6% on average, as compared to dietary supplements. This result suggests that the price reduction in public hospitals has been transmitted to similar drugs sold at retail pharmacies, but with a limited magnitude.

We then explore the mechanisms that limit the. First, the effect is concentrated on oral drugs treating chronic diseases such as hypertension and diabetes, but not on other OTC drugs or drus requiring injections. Second, price of drugs reduced to a smaller scale in the medical insurance designated pharmacies, where consumers could pay the bill through their medical account. Third, prices of drugs with manufactures that also provide drugs to the hospitals have reduced more than those with other manufactures.

Our work contributes to the literature on drug competition. The evidence suggests incomplete competition between hospitals and retail pharmacies. The work also enhances the understanding on the spillover effect of public policies. It shows that the centraliced procurement in public hospitals has affected the retail pharmacies in the priate sector.

abs-os102 HONORABLE MENTION FOR ADAM WAGSTAFF AWARD: Decentralized Policymaking and Market Distortions: Evidence From China's Drug Formulary Design

PRESENTER: **Chenyuan Liu**
AUTHORS: Haiting Tian, Wanyu Yang

In many countries, central governments establish essential medicine lists and drug formularies as part of public health insurance programs to enhance drug access and improve health outcomes. One open policy question is about whether drug formularies should be managed nationally or sub-nationally. Local governments often possess better information about regional health needs. However, decentralized drug formularies may harm equity, and may cause inefficiency and bias due to potential capture by local interest groups. This paper investigates the trade-offs between national and local policy-making in the context of drug formulary design in China.

China's public health insurance program introduced its first drug formulary in 2000, permitting provinces to adjust 15% of the listed drugs to reflect local conditions. While this decentralized approach aimed to address regional disease prevalence and demand heterogeneity, anecdotal evidence suggests that provincial governments often used it to prioritize local producers, resulting in market distortions. In light of this, the central government unified the drug formulary nationally in 2019.

This study examines whether provincial governments favored local firms in formulary design before 2019 and evaluates the social costs of this decentralization. Using hand-collected data on China's drug formularies from 2005, 2009, and 2017, we examine the relation between local firm presence and insurance coverage for the corresponding drug. To control for common demand factors, we restrict the comparison to drug-provinces with similar indications and mechanisms. We further employ an instrumental variable design, using the uncorrelated portion of historical disease prevalence with current disease prevalence as an instrument for the presence of local firms. Finally, we use the drug sales data

and employ an event study to examine whether drugs added to the provincial formulary experience an increasing pre-trend in demand.

We find robust evidence that the presence of local producers significantly increased the likelihood of their drugs being added to provincial formularies, independent of demand factors. The bias was particularly pronounced for local state-owned enterprises and joint ventures, with stronger effects for firms contributing higher tax revenues. However, firms investing more in research and development or providing significant local employment did not benefit disproportionately.

To assess welfare implications, we construct a conceptual framework comparing centralized and decentralized formulary designs. Decentralization leverages local information to tailor formularies to regional needs but introduces distortions due to local governments' private incentives, such as tax revenues and lobbying payments. Centralization mitigates these distortions but sacrifices responsiveness to local demand heterogeneity. Simulations based on our model reveal that decentralized policy-making achieved less than 20% of the potential social surplus under a first-best policy, whereas a national formulary achieved over 70%. These results support the 2019 reform's shift to centralized policy-making.

Our findings contribute to the literature on preferential policies favoring local firms, highlighting decentralized public insurance programs as an underexplored channel for local protectionism. Additionally, we extend discussions on optimal formulary design, connecting the context of China's healthcare system with broader themes in health economics. The results underscore the trade-offs inherent in balancing equity, efficiency, and responsiveness in public health policy-making.

abs-os134 Improving Regulation for Innovation: Evidence From China's Pharmaceutical Industry

PRESENTER: **Ms. Jianan Yang**
AUTHORS: Xiao Ma, Yiran Zhang, Ruixue Jia

Medical innovation is essential for improving health outcomes and extending life expectancy. However, most research in this field focuses on developed economies, leaving the challenges and opportunities in emerging markets underexplored. These markets face unique hurdles, such as government and market inefficiencies, which hinder pharmaceutical innovation. Traditional strategies like foreign direct investment (FDI) and state-led industrial policies have achieved limited success in this domain. This paper explores regulatory reform as a strategy to enhance medical innovation in emerging economies, focusing on China's experience.

A major barrier in emerging markets is the lengthy approval process for new drug development, which significantly delays innovation. Developed regions enjoy efficient regulatory systems, while developing nations often face substantial delays. For instance, before 2015, China's approval process for investigational new drugs (INDs) could take up to four times longer than in developed nations. Similar challenges led countries like Malaysia and Brazil to introduce reforms in the early 2010s, successfully reducing approval times. In China, regulatory inefficiencies, including a lack of personnel and expertise, caused severe delays and backlogs in drug applications. In response, the China Food and Drug Administration (CFDA) implemented 2015 reforms modeled after the U.S. Prescription Drug User Fee Act (PDUFA), introducing user fees to enhance staffing and infrastructure, which significantly reduced IND approval times.

This paper evaluates the impact of these reforms on the quantity and novelty of pharmaceutical innovation in China. By analyzing variation in reduction time at the drug level, measured over three years before and after the regulatory reform (2015–2017 vs. 2012–2014), and using a difference-in-differences strategy, the study finds that reducing approval time by one standard deviation (227 days) led to a 68% increase in INDs between 2018 and 2021. This growth was evenly split between existing and new firms, with clinical trials increasing across all phases. The reforms also influenced innovation novelty. While within-category innovation remained largely unchanged, shifts in firm composition significantly enhanced aggregate novelty. Specifically, the reforms accounted for 38% of the increase in new drug targets observed post-reform, with new firms contributing 74% of this growth. These firms demonstrated a strong focus on exploring novel targets, elevating overall industry innovativeness.

The study also examines market reactions, revealing that post-reform approvals of new drug applications (NDAs) elicited significantly more positive stock market responses than generic drugs. This suggests heightened market confidence in the reforms' effectiveness.

Overall, the research highlights how regulatory practices shape innovation. In emerging markets like China, inefficient regulation has long hindered innovation by raising costs and discouraging the entry of innovative firms. By addressing these barriers, targeted reforms can enhance both the quantity and quality of pharmaceutical innovation. This study contributes to the broader literature on regulation and innovation, emphasizing the importance of tailoring regulatory practices to the specific needs and challenges of emerging economies. It underscores the potential of strategic regulatory reforms to transform emerging markets into hubs of medical innovation, bridging the gap with their developed counterparts.

10:30 AM –11:00 AM WEDNESDAY [Social Events]

Bali International Convention Centre – BICC Foyers

Refreshment Break

Bali International Convention Centre – Orchid

Substance Use and Mental Health

MODERATOR: **Shehzad Ali**,

Ind-2321 Costs and Healthcare Utilization Associated with Alcohol Use Disorder: A Cohort Study

PRESENTER: **Madeline Brendle**
AUTHORS: Mr. Anton Avanceña, Jovan Julien

Alcohol use disorder (AUD) is the most common substance use disorder globally and is associated with increased healthcare costs and utilization. This cohort study evaluated the healthcare costs and utilization associated with AUD using Merative ™ MarketScan® Commercial Claims data from 2016-2020. The data contains patient demographics, diagnosis codes, and claims for inpatient/outpatient services and prescriptions. We identified individuals with an AUD diagnosis in each year of the study period (2017, 2018, 2019) based on at least 1 primary/secondary diagnosis of AUD in inpatient and outpatient claims using ICD-9/ICD-10 codes. Individuals were included if they were 18+ years old; had no missing values for key variables; and had at least 6 months of continuous health insurance coverage before and after the earliest date of their AUD diagnosis. We identified and measured patient-level sociodemographic and clinical characteristics. The outcomes estimated included healthcare utilization (i.e., inpatient visits and length of stay [LOS], emergency department [ED] visits, and total and AUD-indicated prescriptions) and costs (i.e., inpatient, outpatient, total and AUD-indicated prescriptions). AUD-indicated prescriptions included acamprosate, disulfiram, and naltrexone. Healthcare costs were estimated as the average per-patient per-month costs over the 6-month pre-index and 6-month follow-up periods. A random control group with no prior or current AUD diagnosis was identified and were matched to the AUD cohort using propensity score matching with a greedy nearest neighbor 1:1 matching approach with no replacement. After matching, generalized linear models were used to estimate the differences in healthcare costs and utilization between the AUD and control groups for the 6-month follow-up period. For healthcare costs, we used a log-link function with a gamma distribution and estimated average marginal effects (AME). For utilization outcomes, we employed a negative binomial regression to estimate incidence rate ratios. We identified 72,410, 76,075, and 73,485 individuals with AUD in 2017, 2018, and 2019, respectively. The study cohort for each year had a mean age of 41 (SD 14) and were predominantly male (63%). During the 6-month pre-index period, the AUD cohorts had the following service utilization: inpatient admissions (2017: 14,022 (19%), 2018: 13,479 (18%), 2019: 12,527 (17%)), outpatient services (2017: 67,088 (93%), 2018: 70,762 (93%), 2019: 68,999 (94%)), ED visits (2017: 25,992 (36%), 2018: 25,818 (34%), 2019: 22,883 (31%)), prescriptions (2017: 54,656 (75%), 2018: 58,123 (76%), 2019: 56,838 (77%)), AUD prescriptions (2017: 348 (0.5%), 2018: 263 (0.3%), 2019: 542 (0.7%)). In the 6-month follow-up period, individuals with AUD had significantly higher total healthcare costs compared to controls (p-value<0.0001), with an AME of $2,291, $2,131, and $1,978, for 2017, 2018, and 2019, respectively. This was primarily driven by inpatient costs, with an AME of $1,791, $1,832, and $1,852 in 2017, 2018, and 2019, respectively. Individuals with AUD in each year had significantly higher healthcare utilization compared to controls for LOS, ED visits, and prescriptions. This study demonstrates the continuing significant disease and economic burden of individuals with AUD. Healthcare cost and resource utilization associated with AUD may be reduced through appropriate treatment that targets reductions in alcohol consumption.

Ind-1002 Opioid Use Disorder Probabilities and Market Share by Use Disorder Status in Two Longitudinal US Medicaid Datasets

PRESENTER: **Ted Miller**
AUTHORS: Sandra Agik, Geetha Waehrer, Samisthra Pal, Allen Dobson

Background /Objectives. Litigation over the US opioid crisis provided temporary access to longitudinal Medicaid claims datasets from New Mexico (NM) and Nevada. Analyzing those datasets as plaintiff experts, we addressed two open questions:

1) From date of first opioid prescription and from date of first high-dosage opioid prescription of 90 morphine milligram equivalents (MMEs) per day, what is the probability of progressing to opioid use disorder (OUD) or overdose over time. 1) What portions of opioid beneficiaries, prescription claims, MMEs, and claims payments are for opioids dispensed to people who have diagnosed OUD/overdose or latent OUD.

Methods: The studied Medicaid programs cover low-income and disabled adults primarily under age 65. Some beneficiaries also are covered by Medicare; the files included all of their claims. Data covered 1/2006-7/2018 in NM and 1/2009-12/2018 in Nevada. Medicaid eligibility expanded in 2015. OUD and overdose were identified by diagnosis code. We defined latent addiction as prescription patterns consistent with opioid misuse or posing a high-risk for dependence and overdose: opioid prescriptions that overlap for at least 15 days, concomitant benzodiazepine and opioid prescriptions, concomitant naltrexone and opioid prescriptions, or an average of at least 90 MMEs per day over a 90-day period. We also studied three other groups: people (a) using less than 90 MMEs of opioids continuously for more than 60 days, (b) with catastrophic diagnoses only controllable with opioids – sickle cell disease, severe burns, or malignant cancer, and (c) intermittently using opioids briefly as in clinical trials. Beneficiaries in probability analyses had >=6 months of claims data before first opioid prescription or prescription pattern commencement. Probabilities we were able to compute varied by state.

Results: Among 342,119 NM beneficiaries prescribed opioids, 2% had catastrophic diagnoses, 12% had OUD/overdose, 8% had latent addiction, 1% used low doses long-term, and 77% used as in clinical trials. In sharp contrast, the percentages were 4%, 37%, 27%, 5%, and 27% for prescription claims and 7%, 53%, 31%, 3%, and 6% for MMEs and claims payments. Among 283,948 NV beneficiaries, comparable beneficiary percentages were 5%, 12%, 14%, 1%, and 68%, with claims and payments again concentrated.

In NM, among 334,926 beneficiaries without catastrophic diagnoses, from first opioid prescription, the OUD/OD probability was 8% within 5 years, 15.5% within 10 years, and 17.5% within 12 years. From latent addiction pattern emergence, it was 29.5% within 5 years, 45.5% within 10 years and 51% within 12 years. It was 29% within 5 years and 50.5% within 10 years in Nevada, with 10-year probabilities of 47%-52% for each component condition except concomitant opioid and naltrexone prescriptions, and a 47% probability with more than 60 days of continuous low-dose use.

Limitations: Some people with latent addiction are never diagnosed with OUD because constant prescription prevents withdrawal symptoms.

Conclusions: Addiction drives opioid demand/prescribing; 20% of users accounted for 84% of sales. Restricting access merely drives these users to street drugs. Had 17.5% and 50% probabilities of serious adverse events been disclosed, opioids probably would not have been approved for general use.

abs-os10 Do Peers Subvert or Support Recovery from Substance Use Disorders

PRESENTER: **Christiern Rose**, University of Queensland
AUTHORS: Jenny Williams, Anne Line Bretteville-Jensen

This research studies peer effects in recovery from substance use disorders. Peers are defined as individuals who share an inpatient treatment episode and reside in the same county, and we examine the impact of peer exposure on post-treatment mortality. The analysis draws on linked administrative data on the universe of individuals who are admitted to inpatient treatment for a substance use disorder in Norway. The impact of peer exposure is identified using variation in the timing of admissions into treatment, which institutional factors ensure is conditionally exogenous. Patients exposed to a greater share of peers from their home-county are found to have a lower mortality risk. A standard deviation increase in the share of home-county peers reduces mortality by 36% relative to the mean, with one additional peer leading to a 5% reduction. The peer-induced reduction in mortality is concentrated amongst individuals admitted for treatment for a drug use disorder (as opposed to an alcohol use disorder) and is driven by peers who themselves receive treatment for a drug use disorder. Informed by our theoretical model, the empirical findings for mortality are consistent with peer effects working through two potential channels; reduced substance use and safer substance use. Examining hospital admission episodes provides further insights into mechanisms through which peers reduce mortality. We find evidence for a dominant mechanism of safer substance use in the first year post-treatment, and for a dominant mechanism of reduced substance use three years after leaving treatment. We conclude that peers from inpatient treatment episodes can be instrumental in supporting recovery outside of clinical settings.

Ind-930 Depression in Ghana: Estimating Prevalence, Health-Seeking Behaviour, and Socioeconomic Drivers

PRESENTER: **Michel Adurayi Amenah**
AUTHORS: Ama Pokuaa Fenny, James Akazili, Irene Agyepong, Tolib Mirzoev, Thomas Mason

Background Depression is a growing global public health issue, affecting approximately 5% of adults. In Ghana, the burden is compounded by limited mental health services, stigma, and socio-economic disparities. Despite increasing recognition of mental health issues, research on depression in Ghana, particularly regarding its socio-economic and demographic determinants, remains limited. There is a significant gap in studies on depression prevalence, health-seeking behaviors, and the underlying drivers in Ghana. This study aims to estimate the prevalence of depression and health-seeking behavior among individuals with depression, and to examine the socio-economic drivers of both depression prevalence and health-seeking behavior. Addressing these gaps is vital for developing targeted interventions and policies for vulnerable populations. **Methods** This study used data from three waves of the Ghana Socioeconomic Panel Survey (GSEPS): 2009/2010 (5,009 households), 2013/2014 (5,010 households), and 2018/2019 (5,669 households), ensuring national representation through a two-stage stratified sampling method. Depression prevalence was assessed using the Kessler Psychological Distress Scale (K10), with participants categorized as "depressed" if they reported mild, moderate, or severe symptoms, and "not depressed" if they reported no significant depression. Health-seeking behavior was defined as consultation with a mental health professional within the past year. Logistic regression models were applied for each survey wave to examine the impact of socio-economic factors (age, gender, region, household size, marital status, education, employment, and religion) on depression and health-seeking behaviors. A random-effects model was used for the panel data to account for unobserved individual characteristics over time. Stata version 18 was used for the analysis. **Results** Approximately 30% of respondents experienced depression in the most recent wave, with severe depression affecting 3.5% of the population. Health-seeking behavior for depression was low, with only 14.9% consulting a mental health professional in 2018/2019, up from 6.38% in 2009/2010. Factors influencing depression prevalence included age, with the elderly (65+) showing higher odds (OR = 1.69, $p < 0.01$), and residents of the Northern Regions (OR = 1.81, $p < 0.01$). Education, particularly secondary education (OR = 0.72, $p < 0.01$), and marital status (OR = 0.601, $p < 0.05$) were protective factors. Health-seeking behavior was influenced by education (OR = 0.398, $p < 0.01$), region (OR = 0.364, $p < 0.01$), communal engagement (OR = 0.752, $p < 0.01$), and income (OR = 1.000, $p < 0.01$). **Discussion/Conclusion** This study highlights the need for targeted mental health interventions for vulnerable populations such as the elderly, widowed, and residents of the Northern Regions, who have higher odds of depression. Expanding mental health services in underserved areas and addressing regional disparities are crucial. The findings suggest that higher education and community engagement protect against depression, indicating that policies promoting mental health literacy in schools and strengthening community support networks could serve as effective preventive measures. The low health-seeking behavior among those with depression points to cultural and structural barriers to care, underscoring the importance of public health campaigns to destigmatize mental health and improve accessibility across socio-economic groups.

abs-os28 Behavioural Traits and Treatment for Substance Use Disorders: Evidence from Indonesia

PRESENTER: **Lisa Cameron**
AUTHORS: Firman Witoelar, Jenny Williams

Recovery from substance use disorders (SUDs) is a slow and difficult process, with relapse common and outcomes uncertain. While much of the accumulated evidence on the efficacy of treatment for SUDs is based on the experience of developed nations, illicit drug use and its associated problems are not confined to prosperous countries. In Indonesia, as with other countries in the Asian region, illicit drug use is a growing challenge. The National Narcotics Agency (Badan Narkotika Nasional, BNN) estimated that there were 6 million illicit drug users in Indonesia in 2017. Indonesia's public health response, underpinned by Law No. 35/2009 on Drugs and Government Regulation No. 25/2011, stipulates compulsory rehabilitation of drug addicts. The scale of the public health response is significant, with a presidential mandate requiring the rehabilitation of 100,000 drug users in 2015, 200,000 in 2016 and 400,000 in 2017. The largest single provider of drug rehabilitation services in Indonesia is the Indonesian government's National Narcotics Agency (BNN). In this research we seek to provide new evidence on the efficacy of BNN's treatment programs, and the role of behavioural traits in recovery from substance use disorders (SUDs). Using individual-level data on patients who undertake high-quality treatment programs at BNN facilities, we find treatment leads to improvements in locus of control (LOC). In contrast, we find no effect of treatment on time preferences or risk attitudes. We show that patients' changes in LOC are associated with a reduction in the frequency of their drug use, and with an increase in both employment and life satisfaction. These findings illuminate a key mechanism through which SUD treatment programs are effective at improving outcomes for people with SUDs in a low income setting.

11:00 AM –12:30 PM WEDNESDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Jakarta A

Advancing Health Preference Elicitation: Methods and Applications

MODERATOR: **Stirling Bryan**,

Ind-1440 Understanding Patient Preferences of Patients with Type 2 Diabetes in Second-Line Drug Intervention: A Discrete Choice Experiment

PRESENTER: **Axel Mühlbacher**, "Gesellschaft f r empirische Beratung GmbH (Berlin), Germany"
AUTHORS: Ann-Kathrin Fischer, Magdalene Bravo Guijarro, Elke Mathey, Andrew Sadler

Background: Type 2 diabetes (T2D) and its treatment plays an increasing role in health care systems. Clinical guidelines provide serval options for second-line therapies without incorporating patient preferences. This study aims to analyze patient's perspective.

Methods: Data was collected between August and November 2023 among German people with diabetes who received metformin monotherapy (inexperienced with study subject) or second-line therapy (prior experiences with study subject). The study developed a discrete choice experiment with literature review, qualitative interviews, pre-tests and quantative online surveys. With a partial profile design, patients were given 12 choice tasks with 3 alternatives. The alternatives differed systematically in terms of benefits, side effects, and administration including risk of myocardial infarction, risk of stroke, risk of nerve damage, risk of nausea, risk of severe hypoglycemia, weight change, type and frequency of intake, and schedule of intake. A random parameter logit model was used for statistical analyses.

Results: A final study population of 583 adult patients (50% in each group) was reached. Risk of nausea, risk of nerve damage, and weight change were the most important attributes influencing choice decision followed by type and frequency of intake, risk of myocardial infarction, risk of stroke, and risk of severe hypoglycemia. In contrast, intake schedule has the least impact. Both study populations seem to have the same preferences on average. However, large standard deviations indicate considerable heterogeneity between respondents, particularly regarding weight changes and type and frequency of intake.

Conclusion: Low to no risk of nausea and nerve damage as well as weight changes are desirable features of treatment regimens for patients with T2D. Risk of myocardial infarction and weekly application also appear to play a crucial role in the evaluation of treatment from patient's perspective. For both groups, some respondents react more strongly to specific attributes than others.

Ind-1906 Societal Preferences for Attributes Associated with Health Gains: a Discrete Choice Experiment in Spain

PRESENTER: **Laura Vallejo-Torres**
AUTHOR: Cristina Valcárcel-Nazco

Background: Most health technology assessment (HTA) agencies exclude distributional concerns in cost-effectiveness analyses (CEA), assuming equal value for everyone's health gains. However, there is growing call for incorporating equity considerations into CEA frameworks. Agencies such as NICE in the UK and ZIN in the Netherlands use severity weights in their evaluations. In Spain, despite the increasing reliance on CEA evidence for decision-making, neither data nor evidence support the use of distributional weights in CEAs. Methods: We conducted a discrete choice experiment on a large and representative sample of the Spanish adult population. Participants were asked to indicate which of two hypothetical treatments they would prefer to be funded by the National Health System (NHS), irrespectively of whether they might ever need it or not. Each respondent was asked to compare eight pairs of treatments. Treatments options varied across five attributes: i) size of health gain achieved by patients, ii) type of the health gain (life expectancy, quality of life or both), iii) income level of target patients, iv) severity level of target patients, and v) cost (expressed as an increase in taxes paid by all citizens, including the respondent). A conditional logit regression model was used to analyse preferences, and marginal rates of substitution were calculated for each attribute relative to cost and health gain size. Results: We obtained responses from 2,500 individuals. Participants significantly preferred treatments with larger health gains,

that improved both life expectancy and quality of life, targeted low-income and high-severity groups, and entailed lower tax increases. Preliminary results show that participants are willing to pay 3.5€ per month in taxes to incorporate a treatment that provides an additional year in good health. They were also willing to pay 6.3€ and 1.8€ per month to incorporate treatments targeting the poorest 25% of the population and individuals with the highest severity level, compared to those targeting the wealthiest and least severe groups, respectively. Additionally, participants were willing to forgo health gains equivalent to six months in good health to prioritize treatments benefiting the most severe patients. These preferences remained consistent after adjusting for demographic and socioeconomic variables. Conclusions: This study provides the first evidence from Spain on societal preferences for attributes associated with health gains. The findings suggest that Spanish citizens assign greater value to health gains for individuals in lower-income or higher-severity groups, highlighting the importance of incorporating equity concerns in health economic evaluations.

Ind-2124 Valuing Preference with DCE By Explicit or Implicit Comparison with ""Immediate Dead"": Feasibility, Utility Distribution and Preference Equivalence

PRESENTER: **Haode Wang**
AUTHORS: Clara Mukuria, Richard Norman, Donna Rowen, Deborah Street

Introduction: Discrete choice experiments (DCEs) are increasingly used in health state valuation studies, though debate persists about the most appropriate method to anchor the utility values on the quality adjusted life year (QALY) scale. This study empirically compares two DCE preference elicitation design approaches for valuing health states, the DCE with a time attribute (DCETTO) and DCE with 2 health profiles and an “immediate death” state as the third option (DCEdeath). The study examines the feasibility, utility distribution and preference equivalence of the two methods using the health and wellbeing measure EQ-HWB.

Methods: Two separate DCE task designs were developed: the DCETTO task was a paired comparison with a varying duration attribute, while the DCEdeath task asked the respondent to select the most and least preferred state from three options, of which one was the dead state. The online survey was administrated to representative samples of the UK and Australian general public. Respondents were randomly allocated to one DCE design and asked to complete 13 tasks. Conditional logit regression was used to generate latent preference values. The coefficients of DCETTO were divided by the duration coefficient and coefficients of DCEdeath were divided by the dead state coefficient to generate the anchored values. Feasibility was evaluated by comparing data quality, decision strategy and feedback. The value set distribution and preference equivalence were evaluated by comparing anchored utility decrements and health state utility values in each country. Regression analyses assessing the impact of anchoring whilst controlling for sub-group characteristics, were used to test the robustness.

Results: Over 2900 respondents completed the DCE survey and passed data quality checks (1453 from UK and 1465 from Australia). Both DCE task designs generated high-quality data and over 90% of all respondents reported no problem in understanding/completing the tasks. Regression analysis produced mainly monotonic coefficients (larger utility decrements for worse health), with a higher proportion of insignificance observed with the wellbeing attributes. Average completion time with DCEdeath task was longer, while the proportion of respondents reporting use of heuristic decision strategies decreased from 47% (DCETTO) to 11% (DCEdeath). The DCEdeath value set has wider utility range with more health states classified as worse-than-death (WTD), increasing from 17% to 24% in the two countries. However, no significant utility value differences identified with health states classified as better-than-death. Significant attribute level disutility differences observed for level 4 and 5. Ranking for EQ-HWB health states remained the same, with a Pearson’s statistic of 0.93. The conclusion remained similar in subgroup analysis.

Conclusion: This is the first study to directly compare the health and wellbeing preferences for a long instrument using both DCETTO and DCEDeath designs. Both designs are feasible but yield substantially different results about whether a state is WTD or not. The study sheds light on the importance of DCE task framing, which should be taken into account in future valuation study design.

Ind-2833 The Effect Between Food Photos and Traffic Light Labelling System in Online Food Choice

PRESENTER: **Dr. Yuan Yuan Wang, PhD**

Abstract **Background:** Consumers are increasingly using online-to-offline (O2O) takeaway apps rather than phone calls to order food from local restaurants. However, the lack of health information may increase the risk of over-intaking unhealthy food. The Traffic Light Labelling System (TLS) uses colour codes to indicate the nutritional quality of food items, providing a quick reference for calorie, fat, sugar, and salt content to nudge consumer’s food choices. It has become increasingly crucial in online takeaway food selection. While previous studies have primarily focused on how TLS assist consumers making healthier food choice on offline food choices, the impact of TLS and food photo on online takeaway choice behaviour and their potential interaction effect have been less explored. **Aim:** This study aims to identify the main effect and interaction effect between food photos and TLS in online food choice. **Methods:** This study combined a Discrete Choice Experiment (DCE) and the 2 × 2 Randomized Controlled Factorial Trial Design. A final list of attributes and their levels for the DCE was generated using a detailed iterative process. This included a literature review, six focus group with those O2O takeaway users. From this process a list of attributes was obtained. Following a three pilot studies, the final list of attributes was selected (meal types, price, online reviews, delivery time and TLS). We used D-efficient design to construct an experimental design for the survey. The survey consisted 24 choice cards, each choice card with three alternatives and one non-purchase option. To ensure reliability, 1,864 aged 18-39 years adult subjects were randomly allocated into one of four DCE surveys: with food photo and TLS, without food photo but with TLS, with food photo but without TLS, without food photo and TLS (Control group). The outcome is the calories, fat, sugar and salt of the chosen food. **Results:** The main effect of TLS is significant on the influence of fat and sugar intake. The main effect of food photos are significant on the influence of salt and calories. The interaction effect between TLS and food photos is only significant on sugar intake. **Conclusions and Implication:** The findings from this study have important implications for online food ordering platforms and public health interventions. The significant interaction between food photos and TLS on sugar intake suggests that the combination of these two elements can be strategically leveraged to

influence consumer behavior.

Ind-1493 Should Willingness-to-Pay Thresholds Change With Disease Severity

PRESENTER: **Erik Grönqvist**, Uppsala University
AUTHORS: Amin Hussain, August Wadell Leimdörfer, Per Johansson

How should limited resources for health care be prioritized? Health economic evaluation can inform policy makers if new medical treatments are good value for money. The standard cost-effectiveness framework maximize QALY gains regardless of how the gains are distributed. However, the way health is produced matters for most people. With general preferences for equity in society, also disease severity would matter for welfare when prioritizing. With public preferences over both disease severity and cost-effectiveness, policy makers need to balance equity with efficiency.

The previous literature on this trade-off is inconclusive (both higher and lower value to disease severity is suggested) likely due to methodological short comings: Using high dimensional DCEs will bias results due to complexity faced by respondents.

To generate consistent estimates, we instead suggest a very stripped down DCE that only compares health related quality of life (HRQoL) and disease severity (DS=1- HRQoL), where both are measured on the same one-dimensional scale 0-1 (0=dead, 1=full health). We also developing a novel and yet very simple way to calculate distributional weights for different level of disease severity in monetary units, which enables an easy scaling up the WTP/ICER thresholds.

Our results show that the Swedish population not only values the amount of health created, but also how it is distributed, prioritizing patients of worse health. The latter supports using higher willingness-to-pay thresholds to treat patients of greater degrees of severity. We find that an HTA-agency should have a twice as high WTP (ICER) threshold for diseases towards patient groups with moderate disease severity (DS=0.5) compared to groups with low disease severity (DS=0.3), and three times as high WTP (ICER) threshold for patient groups with high/very high disease severity (DS=0.7).

11:00 AM –12:30 PM WEDNESDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Jasmine

Chronic Disease, Caregiving, and Loneliness: valuing outcomes

MODERATOR: **Norma Bulamu**,

Ind-852 Mapping KDQoL-36 Onto EQ-5D-5L And SF-6D v2 in Patients Undergoing Dialysis in China

PRESENTER: **ye zhang**, Renmin University

Background: KDQoL-36 were used widely in clinical settings for dialysis patients but it does not allow for the calculation of a quality of life utility score like the EQ-5D-5L or SF-6D v2 and thus cannot be used to calculate the quality-adjusted life year which is used for conducting economic evaluations that is important for healthcare decision-making. One possible solution is to build a mapping algorithm convert KDQoL-36 into EQ-5D-5L or SF-6D v2. This study for the first time generates mapping algorithms for transforming KDQoL-36 scores to EQ-5D-5L utilities and SF-6D v2 utilities used for health economic assessment in China. **Aim:** To develop the mapping algorithms from KDQoL-36 scores onto the EQ-5D-5L and SF-6Dv2 utility values among the dialysis patients in China. **Methods**: We used data from a cross-sectional multicenter survey study in China to map KDQoL-36 onto EQ-5D-5L and SF-6Dv2. The conceptual overlap between the KDQoL-36 and the EQ-5D-5L or SF-6Dv2 was evaluated by Spearman's correlation coefficients. Direct mapping (including OLS, GLM, BRM, TRM, CLAD and ALDVMM) and response mapping (SUROPM) were used to derive mapping functions using the dataset. The model performance was assessed by mean error (ME), mean absolute error (MAE) and root mean square error (RMSE) using 10-fold cross-validation. The KDQOL-36 is made up of a set of subscales scores: PCS, MCS, Symptoms, Effects, Burden and KDCS. The KDCS has been used as an alternative for the other three subscales scores. We therefore mapped from the KDQOL-36 to EQ-5D-5L or SF-6Dv2 using two sets of explanatory variables. **Results**: A total of 378 patients (50.53% female; mean [SD] age: 49.05 [13.34]) were included in this study. The mean utility values of EQ-5D-5L and SF-6D v2 were 0.72 and 0.57, respectively. The correlation between the KDQoL-36 subscales and the observed SF-6D v2 utilities or EQ-5D-5L utilities was strong ($0.60 < r \leq 0.80$) and moderate ($0.40 < r \leq 0.60$) statistically significant, respectively. When mapping to EQ-5D-5L, the application of each predictor set was combined with each regression method, which resulted in 49 candidate models for the EQ-5D-5L mapping function. The ALDVMM with 1 component was the best-performing model (MAE = 0.1579, RMSE = 0.2289). When mapping to SF-6D v2, the application of each predictor set was combined with each regression method, which resulted in 45 candidate models for the SF-6Dv2 mapping function. The TRM was the best-performing model (MAE = 0.1108, RMSE = 0.1508). Generally, KDQOL-36 subscale scores with their square was the optimal predictor set among each model. Overall, models using KDQOL-36 subscale scores showed better fit than using the KDCS. **Conclusion**: ALDVMM and TRM models with the KDQoL-36 scores can be used to predict the EQ-5D-5L and SF-6Dv2 utility values, respectively, among dialysis patients in China. Our mapping algorithms provide an empirical basis for estimating health utilities in dialysis patients when EQ-5D-5L or SF-6Dv2 data are not available. **Keywords:** EQ-5D-5L; SF-6Dv2; KDQoL-36; Mapping; Dialysis

Ind-453 Productivity-Adjusted Life Years (PALYs) And Condition-Specific PALY Loss Among The Late Middle-Aged Adults in China: a Microsimulation Analysis

PRESENTER: **Yawen Jiang**
AUTHORS: Lei Si, Shan Jiang, Wenjie Hu, Huiqiao Gu, Bingxin Hu, Yuanyuan Gu

Background: While conventional measures like disability-adjusted life years (DALYs) focus on health burden, productivity-adjusted life years (PALYs) specifically capture workforce productivity impact of health, which provide unique insights on disease burden by directly measuring economic productivity losses. Despite established PALY estimates in several countries including Australia, Finland, and South Africa, such estimates remain unavailable for China, limiting evidence-based policy-making for its aging workforce.

Objectives: We sought to estimate both individual-level PALY expectancy and population-level total PALYs for the Chinese population aged 50 to 64years. Specifically, the objectives were threefold: to quantify individual PALY expectancy across different age groups and sociodemographic characteristics, to project total population-level PALYs through 2032, and to estimate condition-specific PALY losses at both individual and population levels.

Methods: Using the previously published and validated China Aging and Retirement Simulation Model (CHARISMA), we calculated individual PALY expectancy and condition-specific PALY losses for three age cohorts (ages 50-54, 55-59, 60-64). The model incorporated data from the 2011-2018 China Health and Retirement Longitudinal Study (CHARLS) and simulated individual life trajectories until age 65 or death. Individual-level PALYs were calculated by integrating three components: workforce participation status, productivity loss due to health-related absenteeism, and mortality risk. The simulation tracked 14 specific health conditions and their impact on productivity using annual cycles. Population-level total PALYs were then projected by combining individual PALY estimates with 2018 Chinese population data, forecasting accumulated PALYs through 2032. A probabilistic sensitivity analysis with 1,000 iterations addressed parameter uncertainties by resampling regression coefficients. Condition-specific PALY losses were estimated at both individual and population levels using a counterfactual approach, nullifying each health condition's risk separately while maintaining other parameters. Results were stratified by sex, residence (urban/rural), educational attainment, and marital status.

Results: Average PALY expectancy was 6.80, 4.35, and 1.50 years for ages 50-54, 55-59, and 60-64 respectively, with consistent sociodemographic patterns across all groups. Gender disparities persisted throughout, with males showing higher PALY expectancy (7.45 vs 6.13 years for ages 50-54; 4.80 vs 3.90 for ages 55-59; 1.75 vs 1.25 for ages 60-64). Rural residents consistently demonstrated higher PALY expectancy than urban residents (rural-urban difference: 2.31, 1.73, and 0.71 years for respective age groups). At the population level, projected total PALYs through 2032 reached 1.24 billion years (95% CI: 1.02-1.46 billion). The most significant condition-specific impacts were from dyslipidemia (>80 million population-level PALY loss) and hypertension ~70 million PALYs), with similar patterns across all cohorts.

Conclusions: This study reveals substantial sociodemographic variations and identifies major health conditions impacting workforce productivity. The findings can guide targeted health interventions and inform policies aimed at sustaining workforce productivity and social security amid China's demographic transition.

Ind-629 Comparing EQ-5D-5L and SF-6Dv2 in Measuring Health Status of People Living with HIV/AIDS in China

PRESENTER: **Qing HE**
AUTHORS: Jia Yin, ZhinXin Fan, Qiang Sun

OBJECTIVES: Globally, an appropriate estimate of the health-related quality of life (HRQoL) of people living with HIV/AIDS (PLWHA) is essential for the economic evaluation of antiretroviral therapy (ART) programs to ensure optimal value for money. AIDS is often accompanied by co-morbidities, which complicate and confound data interpretation concerning AIDS-related mortality, costs and quality of life. There is a lack of performance comparisons of the generic quality of life tool EuroQol Five Dimensions Questionnaire (EQ-5D-5L) against Short Form Six-Dimension (SF-6Dv2) among PLWHA in China. This study aimed to compare measurement properties of EQ-5D-5L and SF-6Dv2 among PLWHA, to evaluate the HRQoL of PLWHA on ART and to explore its predictors. METHODS: All PLWHA were recruited from two hospitals in Jinan and Qingdao, Shandong Province, China from November 2023 to January 2024. Respondents were randomly selected and invited to complete both the EQ-5D-5L and SF-6Dv2 through face-to-face interviews or self-administration. The existing Chinese-specific value sets of EQ-5D-5L and SF-6Dv2 were used to calculate the health utility scores (HUS) . Ceiling and floor effects were firstly evaluated. The agreement of HUSs was evaluated by intraclass correlation coefficient (ICC) and Bland-Altman plot. Convergent validity of HUSs and similar dimensions were assessed using Spearman’s correlation coefficient. Known-group validity of the HUSs and EQ-VAS scores was assessed by comparing the scores of PLWHA at different infection stages, and the scores of PLWHA with and without comorbidities. Additionally, factors affecting HUS difference were explored with Tobit regression analysis. RESULTS: Among 313 respondents (94.3% males, mean age 38.12±11.09 years, 9% CD4<200 cells/mm3) in this study, 48.24% of respondents reported no problems on all dimensions of EQ-5D-5L, whilst 10.22% in SF-6Dv2. The strong correlation and agreement between two measures was observed according to Spearman’s rank correlation (0.71) and ICC (0.74). Bland-Altman plot indicated that HUSs were generally higher in EQ-5D-5L, and the mean HUS was higher in EQ-5D-5L than in SF-6Dv2 (0.92 vs 0.78). Meanwhile, strong correlation was detected for two similar dimensions (Pain/Discomfort of EQ-5D-5L and Pain of SF-6Dv2; Anxiety/Depression of EQ-5D-5L and Mental Health of SF-6Dv2). All the three scores could discriminate the difference in the known-groups. Both HUSs were more sensitive than EQ-VAS score. Tobit regression showed that socioeconomic and clinical factors had a significant influence on the difference in HUSs (P< 0.05) . Co-morbidities, economic level and the economic burden of ART had a large impact on utility. CONCLUSIONS: Both EQ-5D-5L and SF-6D appeared to be valid utility instruments among PLWHA in China. However, they cannot be used interchangeably given only moderate agreement was identified, and differences in utilities and ceiling effect were revealed. Further research is warranted to compare the test-retest reliability and responsiveness. The findings suggest that PLWHA receiving ART had good HRQoL. However, concerted efforts targeted at improving CD4 cell count and reducing the economic burden of PLWHA would enhance their HRQoL.

Ind-965 Estimating the Health and Economic Burden of Stroke Among Informal Caregivers in Australia Using Productivity Adjusted Life Year (PALY)

PRESENTER: **Neha Das**

AUTHORS: Dieu Nguyen, Lan Gao, Suzanne Robinson, Peter Lee

Background: The Productivity Adjusted Life Year (PALY) is a novel measure for exploring the societal impact of health conditions on work productivity. It accounts for productivity loss due to absenteeism and presenteeism, labour force dropout, and premature mortality, representing a comprehensive measure for quantifying the productivity impact at the population level. Given that stroke contributed to 143 million DALYs (disability-adjusted life years) (5.7% of total DALYs) in 2019 and the crucial role of caregivers in post-stroke care, it is imperative to understand the productivity impact on caregivers of stroke patients. Apart from this, studies have also demonstrated that there is a negative impact on the quality of life (QoL) of informal caregivers. Aim: Our study aims to estimate the population-level productivity loss of informal caregiving in stroke by quantifying the PALY loss associated with stroke caregivers and the impact on their QoL by calculating quality-adjusted life year (QALYs). Method: Dynamic life table modelling was used to simulate the Australian working-age population (aged 15–65 years) over 30 years of follow-up (2023-2052 inclusive). The model compared the Australian stroke informal carer group and a matching cohort of non-carers. Data was obtained from literature, and publicly available data such as Australian Bureau of Statistics (ABS) and Survey of Disability, Ageing and Carers (SDAC). The population of informal carers was updated in each annual cycle by considering the new cohort of informal carers due to change in the stroke population (forecasted using simple linear regression) and death of informal carers. Labor force participation rates were applied to population estimates to calculate the full-time equivalent (FTE) which was then multiplied by the productivity index and years of life lived (YLL) to estimate PALYs. Productivity index was calculated using absenteeism and presenteeism, sourced from the literature. The unit cost for a PALY was based on the GDP (gross domestic product) per FTE for the corresponding year. Trend in GDP per hour worked from 1975 to 2023 from the ABS was used to project the GDP per FTE for a given year based on a 40-hour work week and 48 weeks worked per working year. Furthermore, the utility values were multiplied by YLL to calculate QALYs. The model was constructed using Microsoft Excel® (Microsoft Corporation, Redmond, WA, US) and outcomes accrued beyond the first year were discounted at 5.0% per annum. Results: Over a 30-year period, 29,701 QALYs, 69,7488 PALYs were lost due to the health and productivity burden attributed to the provision of informal care for stroke patients. The total cost attributed to lost productivity among informal carers for patients with stroke over 30 years was AU$ 14.7 billion. On average, annual informal carer losses were 990 QALYs and 2,250 PALYs, corresponding to AU$ 490 million per year in productivity loss in Australia. Conclusion: Our analyses demonstrate the health and economic consequences of providing care to stroke patients over the forthcoming decades and highlight the need for interventions to reduce the burden of stroke and its impact on caregivers.

Ind-975 Age-specific Health Utility Decrement Associated with Loneliness: Evidence from Australian Longitudinal Data

PRESENTER: **Muhammad Fikru Rizal**

AUTHORS: Matthew Hamilton, Cathy Mihalopoulos, Lidia Engel, Michelle Lim, Arul Earnest, Sharon Clifford

Objective: Loneliness is increasingly recognised as a public health issue due to its known negative impact on health and quality of life. Accurately measuring the health utility decrement associated with loneliness is important, particularly when assessing the cost-effectiveness of interventions to address loneliness. This study aims to examine the extent to which loneliness is associated with reductions in health-related quality of life (HRQoL) in the Australian population by age groups that reflect different life stages and assessing the impact of adjusting for different set observed individual's characteristics.

Methods: Data were drawn from Household Income and Labour Dynamics of Australia (HILDA) Survey. HRQoL was measured using the SF-6D utility score with Australian population weights. The main exposure variables were loneliness, indicated by respondents reporting a score of 5 or higher (on an agreement scale of 1–7) to the statement, "I often feel very lonely". Age was grouped as 15-24, 25-44, 45-64, and 65+ to reflect varying life stages. The main statistical approach is the within-person analysis using linear fixed effects estimator. Time-varying characteristics were used as control variables. These include sociodemographic factors (age, marital status, education level, and per capita income), a dummy indicator for area of residence, a binary indicator for disability, and serious health conditions (binary indicator for common diseases like arthritis, chronic bronchitis, diabetes, depression or anxiety, other mental illness, heart disease, high blood pressure, and any other serious circulatory conditions).

Results: The study analysed a total of 52,963 person-waves, with 53% female participants and 17.5% aged 65 or older. Among those without loneliness, the mean (and standard deviation) of the SF6D health utility for the age groups 15-24, 25-44, 45-64, and 65+ were 0.737 (0.190), 0.719 (0.20), 0.662 (0.229), and 0.585 (0.255), respectively. The unadjusted utility decrements (with standard error in parentheses) associated with loneliness were 0.098 (0.009) for 15-24 years, 0.090 (0.005) for 25-44 years, 0.059 (0.005) for 45-64 years, and 0.043 (0.007) for those aged 65 and above. After adjusting for sociodemographic factors, disability status, and chronic disease conditions, the decrements were slightly reduced to 0.083 (0.010), 0.076 (0.005), 0.058 (0.005), and 0.036 (0.007) for the respective age groups. Sex-specific results show that loneliness is associated with larger health utility decrements in young females (15-24 years) compared to males of the same age. In contrast, older males (65+) exhibit slightly higher decrements than females.

Conclusion: The findings suggest that loneliness is associated with a substantial reduction in HRQoL across all age groups, even after controlling for individuals' socioeconomic characteristics and health conditions. Young adults were found to be experiencing a more pronounced decrement, especially among females. Overall, this evidence is valuable for guiding targeted, cost-effective interventions to address loneliness.

Bali International Convention Centre – Denpasar A

Individual, Community and Social Preference Elicitation

MODERATOR: **Henry Cutler**,

Ind-2222 What do we Value in Value-Based Health Care? Exploring Social Preferences using a Discrete Choice Experiment

PRESENTER: **Mona Aghdaee**, Macquarie University
AUTHORS: Henry Cutler, Yuanyuan Gu, Dandan Yu, Olukorede Abiona

Background: Healthcare spending in high income countries is often wasteful. The United States wasting between 21-47 per cent of national healthcare expenditure annually. System managers and payers have turned towards value-based healthcare (VBHC) to reduce financial waste and improve health outcomes. Understanding what society values in VBHC is critical for aligning resource allocation decisions with patient preferences, to deliver outcomes that matter to patients. **Aims**: Our study sought to identify and measure social preferences that underpin VBHC. We sought to extend the literature by measuring in detail how social preferences for VBHC vary across respondent characteristics. The purpose was to help system managers and payers make better evidence-based trade-offs when making VBHC resource allocation decisions. **Methods:** We combined semi-structured interviews with 20 local health network executives and a Discrete Choice Experiment (DCE) administered to 1,000 nationally representative Australians. Interviews explored resource decision-making processes and VBHC objectives. DCE attributes included all criteria from the Quadruple Aim framework embraced by the U.S. Department of Health and Human Services (HHS). Two experiments were created using a D-efficient factorial design, with participants randomly allocated to each block. Data were analysed using the mixed logit (MIXL) model. Interactions with individual characteristics explored observed preference heterogeneity. A latent class logit model was also estimated. Relative attribute importance was compared across different classes and the posterior probability of class memberships was regressed against individual characteristics using the fractional logit model. **Results:** All VBHC attributes emerged as predictors of choice. On average, respondents assigned the highest relative importance to health outcomes, followed by the likelihood of achieving the desired health outcome and care efficiency. 'Provider experience' had the least impact on respondent choices. Age significantly impacted choices. Older respondents placed more value on patient experience, timeliness of elective surgery, and health outcomes. Younger respondents placed more value on care efficiency. Respondents with greater education placed greater value on patient experience, while respondents with multiple chronic conditions placed more importance on increased certainty of achieving health outcomes and reduced waiting times. Use of the healthcare system in the last 12 months impacted respondent preferences. Of four identified latent classes, Class 4 was the largest membership group with strong preferences for better patient experience and outcomes. Class 2 and Class 3 represented moderate groups with varying preferences. Class 1 was the smallest membership group with strong preferences for care efficiency. **Conclusions:** Our study provides strong evidence of heterogeneous patient preferences for VBHC attributes. This suggests using one set of patient preferences within priority decision making processes will not optimise welfare, nor lead to a VBHC system valued by patients. The relatively large value placed on efficiency by respondents on average suggests their potential concern with current healthcare system waste. This concern was not being driven by altruism, instead it potentially reflects concerns by respondents on future access to health care.

Ind-1030 Genomic Risk Assessment to Inform Risk-tailored Cancer Screening: Community Preferences in Australia

PRESENTER: **Alison Pearce**, University of Sydney
AUTHORS: Julia Steinberg, Karen Canfell, Michael Caruana, Anne Cust, Amelia Smit, Louisa Collins, Cynthia Low, Richard Norman, Amber Salisbury

Background: Genomic testing (for "polygenic risk scores") can provide valuable information on individuals' risk of different diseases including cancers, presenting an opportunity for risk-tailored cancer screening to improve early detection and health outcomes. Potential programs consist of several stages: initial decision to take the genomic test, risk assessment (test itself and return of results), and subsequent cancer screening. Public preferences for program features at each stage can influence a program's acceptability, uptake, and effectiveness. **Aims:** (1) To quantify the preferences of the Australian general population for potential features of genomics-informed risk tailored screening; (2) To assess heterogeneity of preferences. **Methods:** Two online discrete choice experiment (DCE) surveys were conducted in Australia focusing separately on the decision-making and risk assessment stages. Attributes for the decision-making stage DCE were: when and how you are invited, what information you receive before taking the test, whether there is an appointment to discuss the pros and cons, where you do the test, what the test covers and the cost of the genomic test. Attributes for the risk-assessment stage DCE were: how the genomic results are received, who performs the genomic risk prediction, how representative is the genomic risk prediction, data storage of results, information included in the risk assessment, what the genomic test covers and cost of the genomic test. In each DCE participants answered 12 choice tasks showing two alternative genomic testing programs, and an opt-out option only in the risk assessment DCE. Results were analysed using conditional logit, mixed logit and latent class models, and the willingness-to-pay was calculated. **Results:** There were 821 participants in the decision-making stage DCE and 801 in the risk assessment stage DCE, all generally representative of the Australian population. For the initial decision-making stage, few attributes were significant, with the strongest preference for a comprehensive risk test including multiple cancers ($p<0.01$), or multiple cancers and other serious diseases ($p<0.01$), rather than a single-cancer test. For the risk assessment stage, participants preferred more comprehensive testing, results including advice on non-genomic risk factors, and genomic analysis by a government health department (versus an international company). Some preferences were particularly strong, with willingness-to-pay of $168 for a comprehensive multi-disease test (versus a single-cancer test), and $140 to avoid opting out of risk assessment. Those with negative attitudes towards genomics were more likely to opt-out ($p<0.01$) and indicate concerns about genomic data storage ($p<0.05$). **Conclusions:** This study suggests that the

public would be interested in genomic risk assessment, and have few concerns about deciding to take a genomic test to inform cancer screening. However, they have strong preferences for ow the test is taken and how results are communicated, as well as wanting more comprehensive tests. These findings can help design potential acceptable and effective genomics-informed cancer screening programs tailored to the Australian context.

Ind-1682 Medical Students Preferences for Specialty Choice in South Korea: A Discrete Choice Experiment

PRESENTER: **Moo Hyuk Lee**
AUTHORS: Young Kyung Do, Soela Kim, Eunhye Hyun, Dong-eon Oh, Taehoon Kim

Background:

Physicians' specialty choice arises from complex interactions throughout their careers, beginning in medical school. Medical students' preferences are shaped by various financial and non-financial factors, ultimately influencing the future distribution of physician workforce. Understanding the trade-offs among these factors is crucial for informing policy and education strategies. This issue is particularly pressing in South Korea's crisis-stricken healthcare system. Junior doctors have walked off their jobs and medical students have been on leave for nine months, protesting the government's plan to increase the annual medical school admissions quota by 65% to resolve imbalances in physician workforce distribution.

Previous studies have primarily focused on trade-offs among salary, workload, and working environment in medical students' career decisions. However, the significance of other factors such as legal risk and professional satisfaction remains underexplored, with limited insights into their implications for specialty distribution imbalances. This study aims to fill this gap by quantifying the relative importance of key non-financial attributes that influence medical students' specialty preferences and calculating their trade-offs with salary.

Methods:

A discrete choice experiment (DCE) was conducted with 610 medical students from 26 medical schools across South Korea. Five key attributes – salary, workload, diversity of work opportunities, legal liability and lawsuit risk, and professional job satisfaction as a physician – were identified based on group discussion sessions involving medical students. Levels for salary were presented as percentages of the average salary of medical doctors (50%, 75%, 100%, 125%, 150%). The other four attributes were presented as categorical levels: low, middle, and high. Respondents were asked to choose between hypothetical specialties with varying attribute levels. Coefficients were estimated using a conditional logit model, and willingness-to-accept (WTA) values were calculated to quantify trade-offs between salary and other attributes. A subgroup analysis based on career aspirations was also conducted.

Results:

Medical students were more likely to choose specialties with higher salaries, greater diversity of work opportunities, and higher professional satisfaction, while higher workload and legal liability reduced the probability of selecting a specialty. An increase in workload and legal liability from low to high would require additional compensation of 43.3% ($P < 0.001$) and 60.5% ($P < 0.001$) of the average medical doctor's salary, respectively. In contrast, an increase in diversity of work opportunities and professional satisfaction would allow respondents to accept a salary reduction of 13.1% ($P < 0.001$) and 29.7% ($P < 0.001$) of average medical doctor's salary, respectively. Subgroup analysis revealed that students aspiring to become university hospital professors were willing to accept more salary reductions for increased job satisfaction (WTA = -58.4%) but would require greater compensation for greater workload (WTA = 51.5%) or higher legal liability (WTA = 72.8%).

Discussion:

The findings emphasize that non-financial factors such as workload, legal liability, and professional satisfaction substantially affect specialty choice. The exceptionally high WTA for legal liability underscores that malpractice risk is a significant concern. Our findings suggest that policies should focus on enhancing how non-financial factors such as workload, litigation risk, and professional satisfaction collectively shape aspiring physicians' specialty preferences.

Ind-1876 Preferences for Primary Healthcare Providers among Urban Slum Dwellers of Dhaka City in Bangladesh: A Discrete Choice Experiment

PRESENTER: **Md Zahid Hasan**
AUTHORS: Tim Ensor, Edward JD Webb, Zahidul Quayyum

Background: Strengthening and reforming the urban primary healthcare (PHC) system is essential to efficiently deliver need-based healthcare services to the rapidly increasing urban poor population in Bangladesh. Aligning resource allocation with the preferences of urban slum dwellers is crucial in delivering the services they need in a low-cost and accessible way. However, it is unclear what attributes low-income people prioritise when choosing healthcare provider during their major and minor illness condition. We conducted a discrete choice experiment (DCE) among the low-income slum dwellers to elicit their preference for healthcare providers based on a series of descriptive attributes.

Methods: The DCE was developed through a systematic review along with four focus group discussions with slum dwellers and nine key informant interviews with healthcare providers four one-to-one consultation with health system experts and finally ranking exercise with 15 community people. Six attributes were selected including travel time (15-minutes, 30-minutes, 60-minutes), waiting time (0-minutes, 15-minutes, 30-minutes), recommendation (none, positive, negative), qualification of healthcare providers (not-qualified, qualified general physician, expert physician), consultation fees in Bangladesh Taka (BDT) (Free, 100, 200, 500), and discount on medicines (none, 50%, 100%). A Bayesian D-efficient design was used to construct choice sets using NGene. In each DCE task, participants were shown three choice options;

two hypothetical PHC providers and an opt-out (local pharmacy). They made two choices, first imagining they were seeking healthcare for a minor illness, and then imagining for a major illness. A total of 304, determined using rule of thumb for DCE, face-to-face interviews were completed during January-February 2024 in two selected slums of Dhaka City in Bangladesh. A conditional mixed-logit models and latent class analysis (LCA) were used to analyze the data for each of the two scenarios, separately.

Results: Participants chose the opt-out 28.5% of the times for minor illness and never chosen opt-out for major illness of 3040 choices in both scenarios. Findings showed that for minor illness, among all attributes, the relative importance for consultation fee was the highest. Utility was significantly decreasing with the increasing of consultation fees and was the highest for general physician in the provider qualification attribute. Participants' preferences changed when imagining they had a major illness, with relative importance became higher for provider's qualification.* *They had a significantly highest preference for expert physician and negative preference for 60 minutes to reach facility.** The optimal model had three latent classes in both major and minor illness scenarios with the highest class corresponding to 53.4% and 65.1% respondents, respectively and had similar findings as mixed logit model. Findings will be used to understand how people make trade-offs across the attributes in case of major and minor illness while choosing a healthcare provider.

Conclusion: Understanding the priorities of patients when choosing PHC providers is essential for ensuring equitable access to healthcare in urban areas, especially in limited resource settings. Allocation of resources for strengthening PHC services with the needs and preferences of the urban low-income people can enhance their access to healthcare services towards better health outcomes.

11:00 AM –12:30 PM WEDNESDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Executive Room 2

Evaluations of Alternative Care Models

MODERATOR: **Johannes Cordier**, University of St. Gallen - School of Medicine

Ind-1844 Economic Optimisation through Adherence to Best Practice Guidelines: A Decision Analysis of Traumatic Spinal Cord Injury Care Pathways in Australia

PRESENTER: **Bharat Phani Vaikuntam**
AUTHORS: Lisa Sharwood, Luke Brian Connelly, James Middleton

Introduction: Traumatic spinal cord injuries (TSCI) have significant health, economic, and social effects on individuals, families, and society. Tailored research is essential to inform policy and clinical practice changes that could yield healthcare savings, productivity gains, and improvements in patient functioning and wellbeing. However, translating research into practice remains challenging.

Methods: In this economic analysis modelling study, we used record-linked administrative patient data from New South Wales, Australia to construct a decision tree model to compare the economic cost of acute care for patients with TSCI under current clinical pathways with a optimal care (consensus guidelines-informed) modelled pathway. The optimal care pathway included direct transfer to specialist SCI Unit(SCIU) or indirect transfer to SCIU within 24 hours of injury, surgical intervention within 12 hours of injury, and subsequent inpatient rehabilitation. Propensity score matching with inverse probability of treatment weighting(IPTW) was used to reduce potential confounding from baseline differences in patient characteristics. A Generalised Linear Model regression with gamma distribution and log link, weighted with IPTW scores, was used for costs and length of stay estimations to reduce any residual bias. Sensitivity analyses quantified the sensitivity of the findings to key model parameters.

Results: From the healthcare payer perspective, our economic analysis found acute TSCI care at a SCIU was more expensive, with delayed patient transfer pathways, surgery, and timing of surgery driving higher per-patient costs ($14,322 at specialist centres). Probabilistic sensitivity analysis(PSA) using 10,000 Monte Carlo iterations showed the modelled optimal pathway as the expensive option in majority (86%) of stimulations. However, the modelled direct transfer care pathway demonstrated economic improvements compared to current care pathways, despite a higher upfront cost ($25,428 per patient), the modelled pathway reduced the episode length of stay by 5 days (23 days vs 28 days) on average, generating system-level savings of $20,628 per patient. In PSA, increasing the proportion of patients directly transferred to SCIU by 25%, the optimised pathway was preferred in 28.3% of the simulations. Furthermore, adopting this pathway lowered the incremental per patient cost to $17,157 while preserving a 5-day length of stay benefit compared to current pathways (22 days vs 27 days), which could generate potential savings of $3,471 per patient.

Conclusion: Our findings show that guideline-based acute care management is initially resource-intensive, but efficient in terms of patient length of stay, with a higher proportion of direct transfers resulting in cost savings of $3,471 per patient, which represent system-level benefits from adopting the modelled pathway, rather than episode-level savings*.* Following consensus guidelines for acute care can provide an economically sustainable approach to resource-intensive patient needs while improving outcomes, as demonstrated in previous studies. In summary, while more intensive, adhering to clinical guidelines of direct transfer to SCIU demonstrates value for patients and health systems. Standardisation to optimise time to surgery can achieve improved outcomes through earlier access to rehabilitation and substantial care efficiencies. These findings highlight the economic case for adherence to best practice care guidelines at the healthcare system-level to inform future healthcare planning for patients with TSCI.

Ind-885 Assessing the Long-term Impacts of Integrated Care on Medical Expenditures and Healthcare Quality: A Matched Cohort Study

PRESENTER: **Yi-An Chen**, "Institute of Public Health, National Yang Ming Chiao Tung University"
AUTHOR: Li-Lin Liang

Background and Objectives

Chronic diseases necessitate long-term management, with rising prevalence and associated healthcare costs posing significant challenges. Integrated care models have been adopted to address these challenges, yet evidence on their long-term impacts remains limited, especially during the COVID-19 pandemic. Taiwan's Family Doctor Plan (FDP), implemented by the National Health Insurance Administration (NHIA), incorporates multidisciplinary care teams, case management, and integrated care pathways to improve outcomes for chronic patients. This study evaluates the long-term effects of FDP on medical expenditures and healthcare quality from 2017 to 2022.

Methods

This longitudinal study utilized data from the NHIA's Applied Health Research Data Integration Service. From a three-million-person random sample, chronic patients not enrolled in FDP between 2014 and 2016 were identified as study subjects to evaluate FDP's impact during the follow-up period (2017–2022). The treatment group included 16,365 patients continuously enrolled in FDP from 2017 to 2022, while the control group comprised 48,925 eligible but non-enrolled patients. The NHIA determined patient enrollment; however, physician participation was voluntary. To minimize selection bias, 1:3 propensity score matching was performed using comprehensive sets of patient and provider characteristics. Control variables included medical resource density and socioeconomic status. Matched difference-in-differences analysis was conducted to estimate FDP's impact, stratified into pre-COVID (2017–2019) and post-COVID (2020–2022) periods. Outcome measures included medical expenditures, avoidable hospital admissions, and potentially avoidable emergency department (ED) visits. Event study analysis confirmed the parallel trends assumption.

Results

Integrated care significantly reduced healthcare expenditures, with an annual average decline of 1,468.6 NTD (95% CI: 560.8, 2,376.5; p=0.002) over six years, equivalent to a 5% decrease based on mean baseline annual expenditure. Cost reductions were more substantial pre-COVID (-1,723.6 NTD; 95% CI: -2,596.8, -850.4; p=0.000) than post-COVID (-1,237.7 NTD; 95% CI: -2,450.1, -25.3; p=0.045). The FDP reduced avoidable hospitalizations pre-COVID (IRR: 0.85; 95% CI: 0.73, 0.98; p=0.03), but this benefit diminished during the pandemic (IRR: 0.95; 95% CI: 0.82, 1.10; p=0.495). No significant reductions in avoidable ED visits were observed across the study periods.

Conclusions

Integrated care effectively reduced medical expenditures over time, though the benefits lessened during the COVID-19 pandemic. The cost-saving effect highlights the importance of FDP in alleviating the burden of chronic disease in the long term. The pre-pandemic reduction in avoidable admissions was not sustained during the pandemic, which could be due to disruptions in chronic care. Additionally, Taiwan's high healthcare accessibility and limited control by FDP physicians over patient-initiated ED visits may reduce the program's impact on avoidable ED visits.

Implications for Policy and Practice

This study highlights the potential for long-term integrated care to save costs and enhance care quality, highlighting cost-effectiveness analysis as an important direction for future research. Policymakers should consider improving integrated care models to sustain chronic care quality during public health crises like COVID-19. Unlike the short-term effects reported in previous literature, which may not fully capture the benefits of integrated care, this research emphasizes the importance of continuous program participation for realizing substantial benefits.

Ind-1858 Adopting a Public-Private Collaboration Model to Strengthen Diagnostics Service Delivery in Public Sector County Referral Hospitals in Kenya

PRESENTER: **Victoria Ngima Wanjohi**, The Robert Gordon University - Scotland
AUTHORS: Gerald Macharia, Fonahanmioluwa Williams, Vincent Omondi

Background

Laboratory services in public sector hospitals remain underfunded and underutilized in Kenya, with laboratories covering <40% of the required test menu with a wide variation across counties. This translates to the availability of approximately 70 tests out of the 250 outlined in the service charter, the majority being basic tests with hardly any offering of specialized tests. Strategic purchasing of laboratory services from the private sector may play a role in addressing gaps, leading to more efficient laboratory operations in the public sector County Referral Hospitals. The Clinical Laboratory Improvement Project is a public-private collaboration (PPC) model to improve the quality of public-sector diagnostics by leveraging the technical and technological expertise of a private-sector laboratory service provider.

Methods

A policy analysis was undertaken to identify potential legal frameworks and commercial options to inform stakeholder engagement. An economic analysis was conducted to assess the current and projected costs of operating a laboratory system for a county government to determine the feasibility and viability of a PPC. The costs assessed included Human Resources for health, infrastructure, reagents, consumables,

Laboratory Information Management Systems, and sample transportation costs. The financial model incorporated facility-level data in making pricing and demand assumptions. Interviews of public and private sector stakeholders were conducted to assess interest in and risk of a PPC.

Findings

A purchasing agreement model, which entails outsourcing of laboratory services through service contracts between county governments and a private laboratory provider, was considered the most feasible approach for the PPC. The model allocates roles to both the county and the private partners over a fixed period and allows the county government to retain control and ownership of facilities, while still benefiting from the efficiency and expertise of private-sector partners. Drivers of financial sustainability included test menu and volume growth, decrease in the cost of goods, no equipment downtime, and labor efficiencies. Potential PPC risks identified include lack of facility autonomy to enable timely payment to the private provider, delayed reimbursement from the National Health Insurance Fund for laboratory services, and lack of a robust waiver policy to curb the abuse of waivers, leading to missed revenue in the laboratory.

Conclusion

Implementing a PPC to improve service delivery in the public health sector is feasible if anchored on a clear legal and regulatory framework, co-created feasibility analyses, sustained government ownership, and political goodwill. To ensure successful implementation, key enablers are operationalizing direct facility financing, timely NHIF reimbursements, and strengthening county-level standard operating procedures for waivers. With one county having put in place these enablers and currently implementing the laboratory PPC contract for one year, an initial assessment revealed that the County Referral Hospital has seen improvements in the number of tests, including highly specialized tests, from 70 to over 1000. The annual test volumes increased from 44,000 to 183,480, with an average monthly revenue of Kshs 4.8 Million from Kshs 697,000. The labor efficiency has increased from 4,520 tests per laboratory technologist to 15,650, with most tests prescribed at the outpatient service delivery point.

Ind-866 Spatial Coverage and Expansion Needs of Lady Health Worker Program in Khyber Pakhtunkhwa (KP), Pakistan: A Population and Distance-Based Analysis

PRESENTER: **Mir Sana Ullah Khan**
AUTHOR: Nida Hameed

Background: Community Health Worker (CHW) programs are critical for expanding primary healthcare access in low- and middle-income countries, yet optimal deployment strategies remain debated. Pakistan's Lady Health Worker (LHW) Program, established in 1994, is one of the world's largest CHW initiatives, providing essential primary healthcare and family planning services to underserved populations, primarily in rural areas and urban slums. But in Khyber Pakhtunkhwa (KP) province, where mountainous terrain and dispersed communities create significant access barriers, the program currently reaches only 48% of the population – well below the provincial target of 61%. While increased coverage is needed, policymakers lack evidence on where to optimally deploy additional LHWs and what resources this would require. This study aims to identify coverage gaps and provide a costed expansion strategy that could inform CHW program planning both within Pakistan and in similar contexts globally.

Research Question: What is the optimal strategy for expanding the Lady Health Worker Program in KP to achieve a 61% coverage rate, considering both population density and geographic terrain?

Methods: We employed a dual-method analytical approach integrating population-based and distance-based assessments of LHW coverage in KP. The population-based method estimated coverage using the national standard of one LHW per 1,200 individuals. The distance-based method assessed spatial allocation of LHWs, setting a benchmark of one LHW per 5 square kilometers to ensure equitable access across diverse terrains. Data sources included the 2023 national census, the KP Multiple Indicator Cluster Survey (MICS 2019), the LHW Management Information System (MIS), and administrative records from the provincial Department of Health. We estimated financial implications using current budget data from the KP government, applying an 8% annual inflation rate (average historical inflation rate for Pakistan) to project costs associated with compensation in each subsequent financial year.

Results: Our analysis reveals significant geographic and population-based coverage gaps across KP province. To reach the 61% coverage target, KP will require 5,072 additional LHWs based on population density standards alone. However, addressing geographic access barriers would require an additional 1,983 LHWs to ensure coverage within a 5km radius. The most severe coverage gaps exist in remote districts where current LHW coverage areas extend up to 38 square kilometres. The projected annual cost for the population-based expansion (5,072 LHWs) is PKR 3.17 billion ($11.4 million), with an additional PKR 1.24 billion ($4.5 million) required for geographic coverage expansion (1,983 LHWs). These estimates include salaries, benefits, and anticipated pension liabilities.

Conclusions and Implications: This research demonstrates that conventional population-based deployment strategies alone may be insufficient to achievee equitable LHW coverage in geographically challenging regions. A comprehensive strategy incorporating both population density and geographic access could significantly improve LHW coverage in KP, though at a substantial fiscal cost. This analysis provides a replicable framework for optimizing CHW deployment in similar settings globally, while highlighting the need to balance coverage targets with financial sustainability. Future research should examine how digital health tools and alternative service delivery models could help bridge remaining access gaps cost-effectively.

Bali International Convention Centre – Karangasem

How Economic Burdens and Social Disparities Shape Health Outcomes

MODERATOR: **Caroline Watts**, The Kirby Institute, UNSW Sydney, NSW

Ind-155 Valuation of Health Losses among Japanese Workers with Children During the COVID-19 Pandemic

PRESENTER: **Narimasa Kumagai**, Seinan Gakuin University

AUTHOR: Aran Tajika

[Background] Women experienced a larger decline in well-being than men did during the COVID-19 pandemic. This loss was greater for parents with childcare responsibilities living in Europe. However, little is known regarding the monetary value of health losses among Japanese workers with children during this time.

[Purpose] To fill this gap, this study attached monetary values to self-assessed poor health (SAPH) due to a lower standard of living among middle-aged Japanese men and women.

[Methods] This study used data on four waves from the Japan Household Panel Survey (JHPS) COVID-19 Special Survey conducted by Keio University to examine the impact of health conditions on life satisfaction among Japanese workers. It used the dichotomous variable PSAH to measure the value lost in moving from good, very good, or excellent health to fair or poor health. To select the explanatory variables for the estimation function measuring the impact of PSAH on life satisfaction, the determinants of PSAH were investigated using the random forest model. Considering the endogeneity between PSAH and life satisfaction, we used the two-stage residual inclusion approach with generalized residuals.

[Results] The results show a significant difference in the monetary value of the loss of life satisfaction due to poor health between adults with children and adults without children. The results support the hypothesis that adults with children experience greater health losses than adults without children do. The health losses of adults with children were approximately 3.49 million Japanese yen (JPY) (7.3 times the average monthly household income), that is, 1.04 million JPY more than that of adults without children. The direct impact of PSAH and severe mental distress on life satisfaction was greater for adults with children than for adults without children.

[Discussion] Adults with children were more likely to experience mental ill-health in the two lowest income classes; thus, the magnitude of the monetary value of the loss of well-being due to poor health during the pandemic increased.

[Conclusions] Higher levels of mental health distress are associated with poorer health; therefore, attention must be paid to changes in income, sleep duration, and job insecurity among adults with children.

Ind-330 Associations Between Socioeconomic Status, Life's Essential 8, and Cardiovascular Diseases in Chinese Hypertensive Patients From Remote Areas

PRESENTER: **Lipei Zhao**

AUTHORS: Jian Wu, Beizhu Ye

Background: Interplay between socioeconomic status (SES) and cardiovascular health (CVH) using Life's Essential 8 (LE8) with cardiovascular diseases (CVD) in hypertensive patients is underinvestigated and necessary for developing prevention strategies for remote areas.** This study aimed to investigate complex relationships between SES, LE8, and CVD in hypertensive patients from remote areas in China. **Methods:** From 1 July to 31 August 2023, a cross-sectional survey of hypertensive patients aged ≥ 65 years was performed in Jia County, a remote area in Henan Province in China, using the cluster sampling method. SES was measured using education, occupation, and annual household income via latent class analysis. According to the updating of the AHA's construct of CVH, the LE8 score (or the number of ideal metrics) was generated. A composite CVD that included coronary heart disease (CHD) and stroke (hemorrhagic stroke and ischemic stroke) was defined as the outcome. Multivariable-adjusted logistic models were used to estimate the odds ratio (OR) for the risk of CVD. A causal mediation analysis under a counterfactual framework was performed to calculate the mediation proportion by the mediator (LE8 score/ number of ideal metrics) for the association between SES and CVD. **Results:** Of 18,963 elderly hypertensive patients, 12437 were eligible for inclusion in our analysis (48.36% with low SES, 40.30% with medium SES, and 11.35% with high SES). In total, 5476 (44.03%) participants had CVD (4321 [34.74%] suffered from stroke and 1982 [15.94%] with CHD). After adjusting for covariates, compared with low SES participants, those with high SES had lower risks of CVD (OR:0.859, 95%CI:0.760-0.971), which was competitively mediated by LE8 score or the number of ideal metrics (mediation proportion: 17.10%, 95%CI:9.52-64.85; 6.54%, 95%CI:2.77-19.12, respectively). Participants with high SES and high LE8 score had a 58.2% lower risk of CVD (OR:0.418, 95% 0.261-0.671) than participants with low SES and low LE8 score. Additionally, participants with high SES and 4-7 LE8 metrics had a 48% lower risk of CVD (OR:0.520, 95% 0.399-0.677) than participants with low SES and 0-1 LE8 metrics. **Conclusion:** A high SES was found to be associated with a lower CVD risk among elderly patients with hypertension. Especially, the LE8 score plays a part in the association between SES and CVD. However, only a small proportion of the socioeconomic inequity in CVD risk was mediated by LE8 score or the number of ideal metrics, which indicates that measures other than healthy behavior and clinical factors promotion to improve social determinants of health are warranted. Meanwhile, hypertensive patients with disadvantaged SES and low LE8 score (or 0-1 number of ideal metrics) have the highest risk of CVD, highlighting the importance of modifying behaviors and clinical factors to reduce CVD burden for hypertensive patients, especially for those of low SES. **Keywords:** Cardiovascular Diseases, Life's Essential 8, Socioeconomic Status, Hypertension, Remote

Ind-541 Prescription-Based Comorbidity Index and Its Association with Pharmaceutical Costs in Australians with Multiple Sclerosis

PRESENTER: **Ting Zhao**, University of Tasmania

AUTHORS: Hasnat Ahmad, Ingrid van der Mei, Bruce Taylor, Andrew Palmer

Background
Multiple sclerosis (MS) is the most common acquired chronic neurological disease affecting young adults in Australia. MS poses a significant economic burden to patients, their care givers, government and the broader community, with pharmaceutical costs being the largest component of direct costs of managing this condition. MS often co-exists with other comorbidities, significantly impacting healthcare costs. While data on comorbidities associated with MS is often limited, utilising the Rx Risk Index based on prescription medication data can help effectively identify both the types and number of comorbidities with a high degree of confidence. Understanding the relationship between comorbidities and pharmaceutical costs is crucial for optimising resource allocation and improving patient care.

Objective This study examines how different levels of comorbidity, as measured by the prescription medication-based Rx-Risk Index, associate with pharmaceutical costs in the Australian MS population using a nationwide cohort.

Methods The study included 1,647 participants from the Australian Multiple Sclerosis Longitudinal Study (AMSLS). Data from the Pharmaceutical Benefits Scheme (PBS) in 2022 were extracted for consented participants. The Rx-Risk Index was used to capture 46 comorbidities. Annual patient out-of-pocket costs, government-paid costs, and total prescription costs for 2022 were calculated for each participant. Baseline regression models on costs were fitted using age and gender as covariates. Rx-Risk scores, ranging from 0 to 46 indicating the number of different comorbidities, and individual comorbidities, indicating the presence or absence of each condition, were added to the base models.

Results The five most common comorbidities identified by the Rx-Risk Index in Australians with MS were depression (42%), gastroesophageal reflux (27%), hyperlipidaemia (26%), hypertension (22%), and pain (20%). Higher Rx-Risk Index scores were significantly associated with increased pharmaceutical costs, with each one unit increase in Rx-Risk score resulting in increases of $41, $741, and $783 in out-of-pocket, government-paid, and total pharmaceutical costs, respectively. Specific comorbidities contributing to higher *total* costs included malignancies, anxiety, epilepsy, hyperlipidaemia, and depression, with respective increases of $8,912, $4,342, $3,654, $1,919, and $1,678 in total pharmaceutical costs. Comorbidities associated with higher *out-of-pocket* costs included malignancies ($145), ischaemic heart disease: hypertension ($126), hypertension ($89), depression ($54), and hyperlipidaemia ($54). Higher *government-paid* costs were associated with malignancies ($8,767), anxiety ($4,337), epilepsy ($3,594), and depression ($1,624).

Conclusion This study utilises the Rx Risk index to capture the comorbidity profiles of Australians with MS using their prescription medication records. It highlights the significant positive association between comorbidities and pharmaceutical costs in the MS population. By focusing on managing high-cost comorbidities, healthcare providers and policymakers can develop strategies to optimise care and reduce costs. Future studies should incorporate clinical or patient-reported data on comorbidities and compare the findings with the outcomes of the Rx Risk Index. This will help assess the reliability and predictive power of the Rx Risk Index within the MS population, allowing for an evaluation of its sensitivity and specificity in identifying comorbid conditions and predicting health outcomes and costs.

Ind-649 Healthcare and Productivity Costs of Diabetes in Finland: A Register-Based Study from 2002 to 2023

PRESENTER: **Olli Kurkela**
AUTHORS: Neill Booth, Kamilla Ryöti

Background

Diabetes continues to be a major public health issue in Finland, placing a considerable economic burden on society. Over the past two decades, Finland has witnessed a substantial increase in the prevalence of type 2 diabetes, along with a shift in the complication profile from macrovascular to microvascular complications. Additionally, the impact of diabetes on the ability to work of the entire working-age population remains largely unexplored. Given these changes in diabetes epidemiology, and earlier difficulties in fully capturing all main cost drivers, there is a pressing need to reassess the economic burden of diabetes in Finland.

Study aim

This study aims to evaluate the healthcare and productivity costs of patients with diabetes, as well as their development, from 2002 to 2023.

Methods

The study is based on data from the FinDM project, including individuals with diagnosed diabetes in Finland identified from national registers from 1964 to 2023. Healthcare resource use is quantified using individual-level records, including both primary and specialized outpatient and inpatient care, as well as medication purchases. Estimates from national unit-cost reports and Diagnostic Related Group (DRG)-based costs will be used to value the resource use. Productivity costs will be assessed using individual-level data on sick leave and disability pensions, and quantified using both human-capital and friction-cost -approaches. Costs will be reported for the total diabetes population and across several subgroups categorized by diabetes type, complication status, and several demographic and socioeconomic factors. The costs attributed to diabetes will be calculated by subtracting the average healthcare costs of the general population from those of diabetic patients. Appropriate regression techniques will be employed to examine the associations between various factors and costs.

Results

Fully-updated data will be available for researchers at the end of November 2024, after which the research is scheduled to begin immediately and full results are expected to be available prior to the 2025 iHEA conference. According to results from preliminary data, the number of people with diabetes has continued to increase since previous estimates from 2017. The number of newly-diagnosed individuals with type 1 diabetes in 2023 were 8% higher than in 2017 (1 685 vs 1 557), while the number of newly-diagnosed individuals with type 2 diabetes were

13% higher between those years (33 469 vs. 29 618). Overall, the numbers of individuals with type 1 and type 2 diabetes in Finland has increased by approximately 10% and 18%, respectively.

Conclusions

This study will provide a comprehensive understanding of the healthcare and productivity costs associated with diabetes in Finland, as well as their distribution across different healthcare sectors and various subgroups. By detailing the resource utilization in diabetes care and identifying major cost drivers, the study will provide valuable insights for the ongoing policy debate surrounding recent healthcare reform in Finland and the role of diabetes care within it. Furthermore, the study highlights important areas for future research with the aim of improving diabetes care in Finland and should also serve as a useful basis for international comparisons.

Ind-748 Trends in the Number and Costs of Suicide Attempts, Suicidal Ideation and Self-Harm Incidents in Youth: Evidence From a Dutch Hospital

PRESENTER: **Naomi van der Linden**
AUTHORS: Christien van der Linden, Larissa Amirjalali, Leona Hakkaart-van Roijen, Shanna Van Der Linden, Merel van Loon-van Gaalen, Kinke Lommerse

Introduction While suicide is the leading cause of death in Dutch youth, the number of suicide attempts (SAs), suicidal ideation (SI) and self-harm incidents (SHI) is substantially larger. It is unknown whether the number of suicide-related emergency department (ED) visits has changed over time. Also, costs of hospital treatments for these patients are unknown. **Aims** This study examines: (1) trends in ED-recorded SAs, SI, and SHI incidents in youth, (2) related hospital costs for these patients, from a health insurer perspective, (3) key changes in the youth mental healthcare landscape over the same period, to provide context to any identified trends. **Methods** Hospital databases were combined to identify all youth ≤27 years visiting a Dutch inner-city ED between 2016-2023 for an SA, SI or SHI. Definitions for these categories were taken from 113 (suicide prevention organization), refined for practical use based on ED literature and case discussions. Hospital records were reviewed manually to determine if the patient met the definitions. Unclarities were discussed within the study team or, subsequently, in an expert panel including a psychiatrist and emergency physician. Descriptive analyses were used to determine trends in the number of primary and repeated SAs. For a random subset of patients (preliminary data, n=10), invoiced hospital care products related to the SA were multiplied by their average tariff in the Netherlands in 2024. Grey and scientific literature were reviewed to identify policy and funding changes related to youth mental healthcare between 2015 and 2023, and any events for which literature reported an association with the mental health of youth in this period. **Preliminary results** The number of SAs increased from 101 in 2016 to 149 in 2023, with the peak in 2022 (n=169), 74% female, median age 21, range 13-27. Recorded cases of SI without SA increased from 7 in 2016 to 16 in 2023, again with the peak in 2022 (n=33), 49% female, median age 22, range 12-27. Recorded SHIs reduced from 34 in 2016 to 24 in 2023 (74% female, median age 20, range 14-27). 18% of patients (n=176) had one or multiple repeat visits for the above reasons, with a median of 2 visits (range 2-12). Based on preliminary data (n=10), median hospital costs related to a SA are €2,813 per patient, ranging from €385 (ED episode) to €14,149 (in-hospital admission including intensive care). The figure below shows a timeline of the most important national events related to youth mental health in the Netherlands between 2015-2023. **Conclusions and implications for policy and practice** The number of ED visits for youth SAs and/or SI increased over time, with a peak in 2022, in the aftermath of COVID-19. ED visits for SHIs decreased. The substantial number of repeated SAs underlines the importance of suicide prevention measures. Further trends will be studied. Hospital-invoiced costs represent only a small part of healthcare costs for these patients, and differ substantially between patients. Future analyses should include societal costs within and outside the healthcare sector.

Ind-915 The Burden of Type 2 Diabetes on the Productivity and Economy in Sub-Saharan Africa: A Life Table Modelling Analysis from a South African Perspective.

PRESENTER: **Assegid Hellebo**
AUTHORS: Andre Pascal Kengne, Zanfina Ademi, Olufunke Alaba

Background Type 2 Diabetes (T2D), a chronic and costly disease, presents a significant public health challenge in developing countries. This challenge is driven by its rapidly growing prevalence, associated complications, and the need for sustained care. T2D burdens individuals, families, societies, and national economies. While the economic impact of T2D is somehow documented in high-income countries, with only six global studies addressing this issue, there is a notable gap in research within Sub-Saharan Africa (SSA). This study aimed to fill the knowledge gap on the economics of T2D in SSA, focusing on South Africa, where an estimated 4.2 million people aged 20–79 live with diabetes, and the economic burden of T2D is growing. **Method** A life table modelling was used to simulate the follow-up of individuals aged 20–65 (working age) with T2D in South Africa. Two life table models were developed to simulate health outcomes for a cohort with and without diabetes. The difference in the number of deaths, years of life lost (YLL), and productivity-adjusted life years (PALYs) lost between the two cohorts represented the burden of diabetes. Scenarios were simulated in which the proportions of gross domestic product (GDP), productivity indices, labour force dropout, and mortality risk trends were adjusted to lower and upper uncertainty bounds. Data were sourced from the International Diabetes Federation, Statistics South Africa, and both publicly available and published sources. The WHO standard annual discount rate of 3% was used for YLL and PALYs. **Results** In 2019, an estimated 9.5% of South Africa's working-age population (7.68% men and 11.37% women), or 3.2 million people, had T2D. Simulated follow-up until retirement predicted 669,427 excess deaths, a loss of 6.2 million years of life (9.3%), and 13 million PALYs (30.6%) in South Africa. On average, this resulted in 3.1 PALYs lost per person. Based on GDP per full-time employee in 2019, the PALYs loss equated to US$223 billion, or US$69,875 per person. **Conclusion** This study underscores the significant economic and societal impact of T2D. Relatively modest improvements in T2D prevention and treatment management could yield substantial economic benefits for South Africa. **Keywords:** South Africa, Diabetes, T2D, Gross Domestic Product, Productivity Loss, Years of Life Lost, PALYs, Productivity-Adjusted Life Years, Life table model 1

Ind-937 Childbirth and Gender Disparity in Labour Market Outcomes: Evidence From an Event Study

PRESENTER: **Souvik Banerjee**, Indian Institute of Technology Bombay
AUTHORS: Preeti Jaiswal, Sankar Mukhopadhyay

Despite increasing economic growth, rising educational attainment, and lowering fertility rates, there exists persistent gender divergence in labour market outcomes in almost all countries. One of the significant factors, discussed widely in developed countries contributing to this existing gender gap is the 'motherhood penalty'. It is defined as the negative impact on various labour market outcomes such as labour force participation, earnings, and work hours resulting from the disproportionate burden of childcare falling exclusively upon the mothers. The Indian labour market has consistently demonstrated significant gender inequality over the past two decades. In 1993-94, male labour force participation was 54.49% and female was 28.56% and by 2023-2024, these rates rose to only 58.2% and 31.7%, underscoring continued gender disparity. There exists scarce literature focusing on the impact of childbirth on female labour market outcomes at the extensive and intensive margins in the Indian context, and particularly its dynamic impact as a child grows up. The present study aims to estimate the causal impact of new childbirth on mothers' labour force participation, earnings, and work hours compared to fathers and married women without children to isolate the gender-specific effect of motherhood.

Using the longitudinal data from the Consumer Pyramids Household Survey (CPHS), conducted by the Centre for Monitoring Indian Economy (CMIE) over the period 2016 to 2023, we employ the dynamic difference-in-differences method, also known as the difference-in-differences event study, including the individual fixed effects, using fathers and married women without children as control groups for the analysis. To address the self-selection of the event (childbirth), we perform kernel matching, nearest neighbour matching, and entropy balancing, which largely validate the parallel trends assumption.

The likelihood of mothers' labour force participation shows a decline of 4% at the time of childbirth in rural regions, while in urban regions, it shows an immediate decrease of almost 4% which further decreases to 10%, four years after childbirth compared to fathers. We find no significant decline in mothers' earnings post-childbirth in rural regions, instead, earnings increase sharply by 25% a year later compared to fathers with no effect in urban regions. Moreover, relative to married women without children, we find a significant increase of 6% in the likelihood of mothers' labour force participation two years post-childbirth in rural regions with no impact in urban regions and an increase of 33% and 18% in mothers' earnings a year after childbirth in rural and urban regions, respectively. We do not find a significant impact on work hours.

The decline in labour force participation reveals the immediate impact of childbirth, but unlike other countries, this decline is temporary and eventually becomes negligible. Our findings on the motherhood penalty, independent of the gender-specific effects, suggest that mothers prioritise their labour market potential compared to non-mothers, though this shift usually takes about two years to materialize. These findings underscore the need for policy interventions that offer affordable childcare and more flexible work arrangements to support a smoother, more timely reintegration of mothers into the workforce.

Ind-1243 Infecting the Wallet: The Economic Burden of Healthcare Associated Infections in Malawi

PRESENTER: **Wala Kamchedzera**, Malawi Liverpool Wellcome Program
AUTHORS: Laura Rosu, Lucky Ngwira, Thomasena O'Byrne, Dorica Ng'ambi, Gabriel Bunduki, Nicholas Feasey, Eve Worrall

Introduction: Healthcare associated infections (HAI) are a leading cause of morbidity and mortality amongst hospitalised patients globally and low resource healthcare systems in low-and-middle-income countries (LMICs) are disproportionately affected. HAIs not only drain a health system's resources but also place considerable economic burden on the patient. Due to increased length of hospital stay because of infection, patients experience increased out of pocket expenditure and large productivity losses. These challenges can be detrimental to the welfare of the patients' household as the risk of incurring catastrophic health expenditure increases, especially for LMICs like Malawi, where the poverty rate is high. Literature on the economic burden of HAIs is growing, yet information from Africa is sparse. Costs are context specific therefore there is a need for country specific estimates of the economic burden of HAIs. Such information will help advocate for resources to be channelled towards innovative infection prevention and control (IPC) interventions. Additionally, it will provide insights on whether new social protection policies that ease the financial burden faced by households are needed. This study aims to measure the costs incurred by hospitalised patients with HAIs in Malawi.

Methods: This study took place at three public hospitals in Malawi, of which two were tertiary/referral and one was a district/secondary-care hospital. Participants were adult patients (≥18) that were hospitalised for >48 hours. Participants with HAIs were matched to those without. Matching was done by ward, age group, type of HAI, and admission to time to infection period at a 1:1 ratio. The direct and indirect costs incurred by the participants during hospital stay were collected through structured interviews. To compare costs, mean cost differences between those with and without HAIs were calculated. As the data was skewed, non-parametric bootstrap methods were used to derive 95% confidence intervals for mean cost differences. We estimated proportion of participants falling into catastrophic expenditure (costs exceeding 40% of annual household income). We used multivariable analysis to find the independent effect of infection on the total cost and determine the main cost predictors.

Preliminary results: Mean total cost incurred by 320 participants was $241.74 (standard error [SE]: 42.4). Patients with HAIs had a higher total cost than those without (mean difference $144.14 [95% confidence interval [CI]: 10.90-335.90]). Total direct costs were higher among those with HAIs by $31.53 (95% CI: 31.53-82.81). However, the total indirect cost faced by patients with HAIs was non-significantly higher than those without. Patients with surgical site infections faced the highest mean total cost, followed by those with catheter-associated urinary tract infections and blood stream infections. For those with complete household income data, 34.1% (105/308) experienced catastrophic expenditure; 44.1% of participants with and 25.5% without HAIs.

Conclusion: Malawian patients incur large economic costs during admission to hospital, some of which are catastrophic. These costs are worsened by the presence of HAIs. Therefore, IPC interventions that can effectively reduce the burden of HAIs are needed. Additionally, these interventions should be implemented alongside social protection policies to protect the most vulnerable households.

Ind-1549 Socioeconomic Value of Ado-trastuzumab Emtansine for HER2+ Breast Cancer Therapy in China

PRESENTER: **Yijia Feng**
AUTHORS: Luying Zhang, Dennis A. Ostwald, Malina Müller, Wen Chen

Background： Breast cancer's incidence rate ranked second among female tumors in China, with 360,000 new breast cancer patients and 75,000 deaths in 2024. Breast cancer has caused a serious economic burden of disease in China, of which HER2+ breast cancer account for up to 20%. Although effective treatment options exist, patients are often not completely cured and are prone to recurrence. Ado-trastuzumab emtansine is mainly applied in the early adjuvant therapy of HER2+ early breast cancer patients with residual invasive lesions and the second-line therapy of patients with unresectable localized or metastatic terminal breast cancer. It can significantly improve quality adjusted life years(QALYs) of patients, enabling them to pursue daily activities and participate in the labor market, which denotes a great socioeconomic value. **Method：** The socioeconomic value of ado-trastuzumab for early adjuvant therapy and terminal second-line therapy of HER2+ breast cancer patients in China were calculated and summed, mainly based on the social impact framework provided by WifOR institute with the input of Chinese localized data. QALYs were applied as an evaluator of health improvement. Gross value added (GVA) was used to measure labor productivity. Number of patients covered by each indication per year was obtained from Roche corporate data. Average hours of paid work and unpaid work for males and females were acquired from Chinese Third National Time-use Survey in 2024. An annual inflation rate of 5% and discount rate of 3% were also set to assess the socioeconomic value of ado-trastuzumab emtansine among Chinese HER2+ breast cancer patients from 2024 to 2032. **Results：** Total socioeconomic value of ado-trastuzumab emtansine applied in Chinese HER2+ breast cancer patients over 9 years is $327,762,612.2. The value generated in early adjuvant therapy is $186,587,525.8, accounting for 56.97%; while the value generated in terminal second-line therapy is $141,175,086.4, accounting for 43.03%. The socioeconomic value of ado-trastuzumab emtansine applied to early adjuvant therapy is significantly higher than that of terminal second-line therapy. Meanwhile, results of the socioeconomic value show a developmental pattern of increasing and then decreasing in both two indications. In the early adjuvant therapy of HER2+ positive breast cancer, predicted socioeconomic value gradually increases from 2024 to 2027, reaching a peak of $26,975,699.1 in 2017, and then declines year after year. In contrast, the value in terminal second-line therapy peaks at $17,921,947.6 in 2025 and also declines annually from 2026 to 2032. Under the assumption of a consistent distribution of patients in both indications, the number of patients may be the main factor affecting above results of socioeconomic value. **Conclusions：** Our study has shown that application of ado-trastuzumab emtansine in Chinese HER2+ breast cancer therapy produces extremely high socioeconomic value, especially in the early adjuvant therapy. It indicated that benefits of ado-trastuzumab emtansine are beyond clinical advantages. The value is mainly influenced by the number of patients to whom ado-trastuzumab emtansine is applied. The larger the number of patients covered is, annual socioeconomic value is higher.

Ind-1581 Estimates of The Value Per Statistical Life in China, Based on The Data From China Family Panel Studies

PRESENTER: **Can Wang**
AUTHORS: Fengyi Sun, Zhan Zhao, Jixuan Wang, Jialong Tan, Jian Wang

Background: The Value of a Statistical Life (VSL) plays a crucial role in cost-benefit analyses, enabling economists to quantify reductions in mortality risk. This tool is particularly valuable for prioritizing projects or policies in resource-constrained settings, especially in public health, workplace safety, transportation, and environmental protection. While OECD and other developed countries have conducted extensive research on VSL, recent estimates in developing countries, including mainland China, remain outdated, largely unchanged from a decade ago.

Objective: This study aims to calculate and compare the 2010 and 2020 VSL estimates in China and explain the reasons for their changes. We explore the income and regional differences in VSL within the country and illustrate the policy implications. The analysis is based on the China Family Panel Studies (2010 and 2020).

Methods: This study adopts the hedonic wage model. It uses the China Family Panel Studies (2010 and 2020) to obtain individual wage rate and personal characteristics data, and integrates industry-specific fatality and incident statistics from the *China Yearbook of Work Safety* (2010) and the *China Yearbook of Emergency Management* (2020) with employment figures from the *China Population Census Yearbook* (2010 and 2020) to calculate industry-specific fatal and non-fatal job risks. The relationship between the individual wage rate and the fatal job risks can be expressed by the hedonic wage regression.

Results:

1. The average age of respondents in 2010 is about 40.66 years old, and the average wage rate is CNY 1.67 per hour; The average age of respondents in 2020 is about 37.36 years old, and the average wage rate is CNY 5.56 per hour.
2. The analysis reveals that for every unit change in fatal job risk, wage rate adjusted by 0.00146 ($P<0.01$) in 2010 and 0.00448 ($P<0.01$) in 2020. For every unit change in non-fatal job risk, wage rate adjusted by -0.000397 ($P<0.01$) in 2010 and -0.00257 ($P<0.01$) in 2020.
3. The resulting VSL is estimated at CNY 0.49 million in 2010, approximately 16 times the national per capita GDP (CNY 29940), and at CNY 4.98 million in 2020, approximately 69 times the national per capita GDP (CNY 72447). After accounting for inflation, China's VSL has grown 4.3 times over the past 10 years. Notably, among different income groups, VSL in the low-income group is CNY -865.59 in 2010, while positive and significant in other groups in 2010 and 2020.

Conclusion: The increase in China's VSL and VSL/GDP ratio reflects a growing societal recognition of life's value and an improvement in economic conditions. At the income level, low-income earners are uncompensated to take on high-risk work in 2010, and improve but still lag

behind high-income groups in 2020; at the regional level, the fatal risk coefficient is high in the Northeast region in 2010, and changes to the West in 2020, and the changes in VSL in each region are closely linked to the economy, industry, and policies. This study provides an important reference for the design of social systems and resource allocation decisions, and deepens the understanding of risk compensation mechanisms in the labour market.

Ind-2049 Socioeconomic-related Inequalities in Multi-dimensional Health Among Older Adults in China: A Population-based Cross-sectional Study

PRESENTER: **Jingxian Wu**
AUTHORS: Yaping Deng, Cong Li

Background Healthy aging, defined as a dynamic process involving the development and maintenance of essential functions, is a multi-dimensional concept relevant to all older adults. As the global population ages, socioeconomic-related health inequalities among older adults have become a critical public health challenge. However, exiting studies on health inequalities in older populations have primarily focused on self-reported or single health dimensions, often neglecting the multi-dimensional nature of healthy aging. This study aims to comprehensively measure and decompose the socioeconomic inequalities across physical, mental, cognitive, and social dimensions of health among older adults in China. **Methods** A cross-sectional analysis was conducted using data from the 2018 Chinese Longitudinal Healthy Longevity Survey, covering 14,310 older adults aged 65 and above. Physical health was assessed using Katz Index of Independence in Activities of Daily Living (ADL) and Nagi Index of Instrumental ADL (IADL). Mental health was evaluated through the 10-item Center for Epidemiologic Studies Depression Scale (CESD). Cognitive health was measured using the Chinese version of the Mini-Mental State Examination (MMSE), and social health was assessed through levels of social participation. All health indicators were unified so that higher scores indicated better health outcomes. Wagstaff's corrected concentration index (CI) was calculated to quantify the socioeconomic-related inequalities for each health dimension, with self-rated household economic status taken as the ranking variable. Pairwise *t*-tests were used to compare CIs across different health dimensions, and WDW decomposition analysis was conducted to identify the contribution of various determinants to inequalities in each health dimension. **Results** All four dimensions of health exhibited significant pro-rich inequalities, with positive and statistically significant CIs ($p<0.001$). Cognitive health, as measured by the MMSE, had the highest degree of pro-rich inequality (CI = 0.0929), followed by physical health as measured by ADL (CI = 0.0726), social health (CI = 0.0692), mental health (CESD, CI = 0.0627), and physical health as indicated by IADL (CI = 0.0589). Pairwise *t*-tests indicated that cognitive health inequality was significantly greater compared to other dimensions. Decomposition analysis revealed that household-level economic factors, including sufficient financial resources and self-rated economic status, were the primary contributors to inequalities across all health dimensions. Additionally, timely access to healthcare significantly contributed to inequalities in physical and cognitive health, while poor sleep was a key factor increasing mental health inequality. For social health inequality, early-life factors, including higher educational attainment and stable job before age of 60, were identified as significant contributors. **Conclusion** This study identified significant pro-rich inequalities in multi-dimensional health among older adults in China, with cognitive health displaying the most pronounced inequalities. Targeted interventions promoting equitable healthcare access, health literacy, and healthy lifestyles are urgently needed, particularly for socioeconomically disadvantaged older adults, to reduce these disparities and advance healthy aging for all. Additional efforts should be made to improve social participation opportunities for economically disadvantaged older adults through community engagement and supportive programs.

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Ind-2671 Future Productivity Loss Due to Death Related to Road Traffic Injuries in the Guadalajara and Mexico City Metropolitan Areas

PRESENTER: **Andrés Vecino Ortiz**, Johns Hopkins University Bloomberg School of Public Health
AUTHORS: Mauro Razuk Filho, Abdul Bachani, Angélica Lopez Hernandez

Road traffic injuries (RTIs) are a leading cause of mortality and economic loss worldwide, with low- and middle-income countries (LMICs) disproportionately affected. In Mexico, RTIs account for 3.5% of disability-adjusted life years (DALYs) and 2.9% of deaths, translating to substantial societal and economic burdens. Despite this, limited studies have evaluated the economic impact of RTI-related fatalities in urban areas. This research addresses this gap by systematically quantifying future productivity losses due to RTI-related fatalities in the Guadalajara Metropolitan Area (GMA) and CDMX, using a human capital approach. The study aims to provide region-specific estimates of the economic impact of RTIs by analyzing mortality and income data across variables such as age, gender, and education. Data were sourced from the National Institute of Statistics and Geography (INEGI), the National Survey of Household Income and Expenditure (ENIGH), and local authorities. The methodological framework involved projecting future income lost due to premature death by combining age-specific annual income with life expectancy estimates, adjusted for inflation, and standardized to 2024 United States Dollars (USD). Statistical analyses were conducted using STATA BE 18.0. The findings reveal a total productivity loss of 300,415,294 USD for the GMA (2015–2022) and 788,590,148 USD for CDMX (2008–2024), representing 1% of each region's GDP in 2021. Gender disparities were evident, with males comprising the majority of RTI-related deaths (81% in GMA; and 77% in CDMX). Noticeably, females in the GMA exhibited lower per capita productivity losses (2,003 USD) compared to males (3,163 USD), reflecting underlying wage inequalities. Educational attainment also influenced outcomes: individuals with higher education levels experienced greater per capita losses due to higher average earnings, but the majority of fatalities occurred among those with lower education levels, exacerbating inequities. This study underscores the critical economic toll of RTIs on urban centers and highlights disparities based on gender, education, and geography. The results indicate that localized interventions are essential, particularly in high-burden areas like Guadalajara and CDMX. While Mexico has implemented national road safety strategies, the persistent economic losses and mortality rates signal the need for more targeted, equitable, and effective policies. The implications of this research extend to public health and economic policy. It emphasizes the necessity of integrating educational and infrastructure improvements into road safety measures. Additionally, the findings support the need for inclusive road safety campaigns addressing gender and socioeconomic disparities. Future research should expand on this work by incorporating non-fatal injuries, healthcare costs, and societal impacts to develop a comprehensive understanding of RTI burdens and guide sustainable, impactful policy reforms.

Bali International Convention Centre – Executive Room 1

Work, Health and Wealth

MODERATOR: **Shiko Maruyama**,

Ind-974 Impacts of Family Caregiving Intensity and Duration on Working Caregivers in Japan: Balancing Work and Caregiving

PRESENTER: **Saki Sugano**

As the number of individuals balancing caregiving and employment rises in Japan, this study investigates the impact of informal caregiving for parents – including caregiving provision, intensity, duration, and nursing home use - on the labor supply of middle-aged children. Using panel data and instrumental variable estimation with parents' certified long-term care levels as instruments, the results show that caregiving, as well as its duration and intensity, significantly reduces both the likelihood of employment and working hours, especially for women. Beginning to give care more than doubles the odds of labor force exit. When caregiving duration expands over multiple years, each additional caregiving wave (about two years) leads to a 8.4 percentage point reduction in employment probability, highlighting the cumulative burden of prolonged caregiving. Caregiving intensity is strongly associated with reduced work hours, with a 1% increase in caregiving time leading to a 0.41% reduction in working hours. Caregiving also affects mental health adversely for women and even for full-time workers. These findings emphasize the need for targeted policies to support caregivers who need to balance between working and caregiving.

Ind-1364 Mother's Time to Return Home From Work and Obesity

PRESENTER: **Akiko Oishi**

AUTHOR: Takuya Hasebe

Background: There is a persistent concern about child obesity among many countries, and this concern is growing in Japan, where adult obesity rates are relatively low compared to other countries. Obesity in childhood, which impairs human capital accumulation, is associated with adverse health, educational, and labor market outcomes in later life. Given the crucial role of parental time inputs in child development, extensive research has examined the relationship between child obesity and parental employment. However, the impact of parents' specific work schedules on child obesity remains unexplored. As more mothers engage in diverse work schedules, understanding the effects not only of their employment status but also of their work timing is crucial. Using Japanese data, this study empirically investigates how parental work schedules relate to child obesity, focusing specifically on the ' timing of parents' return home from work. Understanding the potential impacts of parents' timing to return home late on children offers valuable insights into work-family conflicts.

Methods: We use nationally representative data from the *Longitudinal Survey of Newborns in the 21st Century*, conducted by Japan's Ministry of Health, Labour and Welfare. This survey has annually tracked all children born in Japan during specific weeks in 2001. We estimate lagged-dependent variable models to control for unobserved time-varying confounding factors. First, we focus on children's health-related behaviors—such as time spent sleeping, watching TV, and playing video games—and treat these as outcome variables to examine their relationship with parents' timing of returning home. Next, we analyze children's anthropometric indicators. Specifically, we use children's body mass index (BMI) and indicators of overweight and obesity as outcome variables. Our primary explanatory variable is the timing of parents' return home from work, defined as a set of dummy variables for each one-hour window. Due to the availability of this variable, we focus on the 7th, 10th, and 12th survey waves, corresponding to children ages 7, 10, and 12 -– crucial development stages.

Results: We find that mothers' late return home significantly affects children's behaviors, including bedtime routines, TV watching, and video game playing. Specifically, when mothers return home late, children's weekday bedtimes are delayed, sleep duration is reduced, and time spent watching TV and playing video games increases. Additionally, when mothers return home from work later, their children's BMI tends to be significantly higher for both girls and boys, even after accounting for unobserved heterogeneity. The increase in BMI is primarily due to greater weight gain among girls and reduced height growth among boys. Although the timing of mothers' return home from work is significantly associated with these child health-related outcomes, fathers' return home timing shows no such associations.

Discussion: Our study highlights the importance of maternal work timing, which has received little attention in the existing literature. Differences between mothers' and fathers' return-home timing may indicate an uneven gender division of child-rearing responsibilities among Japanese parents, which should be considered when designing policies promoting female employment.

Ind-1370 Working Conditions and Health Over the Life-cycle: Evidence From Europe

PRESENTER: **Paolo Micera**, Catholic University of the Sacred Heart

AUTHORS: Michele Belloni, Claudio Lucifora

The study explores the long-term impact of working conditions on the health of European workers over their life cycle, particularly around retirement. Driven by the aging population and tightening pension reforms, many workers face extended careers under varying occupational stressors. This research builds on economic theories that view health as a durable capital stock, shaped by investments in well-being and subject to depreciation due to aging and adverse work environments. Poor working conditions and career instability are strongly correlated with physical and mental health deterioration, with gradients varying across occupational classes and intensifying with age.

The research utilizes data from SHARE (Survey on Health, Ageing, and Retirement in Europe), which offers longitudinal insights into individuals' work history, health, and socio-demographic characteristics. The Job Episode Panel (JEP) within SHARE enables retrospective tracking of labor market experiences using detailed ISCO-08 occupational codes. Additionally, the O*NET dataset provides granular

information on present and past working conditions, including physical, social, and environmental stressors, categorized by occupation.

To measure the cumulative impact of job stressors, the study constructs a composite indicator of career-long exposure to harmful conditions, weighted by job duration and employment status (e.g., full-time or part-time). This measure is correlated with various health outcomes - particularly chronic disease measured by an index of the (Instrumental) Activity Daily Limitations, but also the EUROD mental health indicator - revealing significant relationships between cumulative exposure and deteriorating health, particularly in dimensions such as physical environment and working prospects.

A key challenge is addressing endogeneity, particularly initial selection into jobs, job changes depending on health status leading to reverse causation and the "healthy worker effect," where healthier individuals are more likely to remain employed. To overcome possible biases, the study employs an individual fixed effects instrumental variable (IV-FE) approach using Bartik (1991) types of instruments, leveraging technological shocks that exogenously alter occupational task structures. This method isolates variations in working conditions caused by external factors like computerization, ensuring a more robust estimation of their impact on health. The Bartik's instrument is constructed using data from the antecedent of O*NET, namely the Dictionary of Occupational Titles (D.O.T.) reporting working conditions for the year 1969 which serve as initial conditions for the cohorts in our sample.

Preliminary findings highlight the detrimental effects of cumulative exposure to adverse job conditions on health, with older workers experiencing more pronounced declines. For instance, high physical strain in later career stages equates to health declines typically associated with over a year of aging. The research also emphasizes the role of career instability in compounding health risks. These insights have broad implications for labor market and health policies, emphasizing the need for interventions to improve job quality and support workers transitioning into retirement.

This research contributes to the literature by examining cumulative career-long exposures rather than isolated job conditions. It underscores the importance of addressing occupational health disparities, which vary across countries, sectors, and demographic groups, to promote healthier, more sustainable working lives in an aging Europe.

Ind-1649 Minimum Wage Effects on Mental Health of US Adults: Event Study Evidence from BRFSS, 1993-2019

PRESENTER: **Jaclyn Schess**

AUTHORS: Chris Lowenstein, Michael Reich, William Dow

Background: Given the strong socioeconomic gradient in most health outcomes – especially mental and behavioral health outcomes – the minimum wage may be an effective policy tool to improve population health among low-income populations. Despite the growing number of studies examining this association in the United States, there has been a dearth of research on the differential effects across racial and ethnic groups. This knowledge gap is especially surprising, since Black and Hispanic workers are disproportionately represented in the low-wage workforce. Moreover, the studies that have examined this heterogeneity have employed two-way fixed effects approaches that are potentially biased due to staggered policy adoption and dynamic treatment effects. The recent methodological advances – and the growing prevalence of poor mental and behavioral health among racial and ethnic minorities –warrant a re-evaluation of the effects of minimum wages on mental health outcomes. Research aim: The purpose of this study is to examine the effect of state-level minimum wage increases on self-reported mental, physical, and general health status and alcohol use among a sample of young adults likely exposed to minimum wage hikes. We add to the literature by documenting differences in these outcomes across race and ethnicity and by using event study methods to examine how minimum wage policies may differentially affect mental health outcomes across subgroups of the low-wage workforce. Methods: Our outcomes of interest are obtained from the Behavioral Risk Factor Surveillance System (BRFSS), a telephone-based cross-sectional survey of US adults with approximately 400,000 annual respondents. In this analysis, we use data for survey years 1993 to 2019. Using an event study approach we examine the effect of state-level minimum wage increases on self-reported mental, physical, and general health status and alcohol use among a sample of young adults likely exposed to minimum wage policies. In our event study design, we define qualifying minimum wages as those with year-on-year increases of at least $0.25 (2019$) with at least 2 full calendar years without a minimum wage change prior to the event. To examine dynamic effects over time, we include 5 years following a state-level change. Key results: Our analysis finds that increased minimum wages improve the self-rated health of non-Hispanic Black workers, particularly improving self-rated general health and mental health. We find no overall or group-specific effects on other outcomes (e.g. physical health, frequent mental distress, drinking). In addition, we estimate a placebo of minimum wage effects among working age adults with a Bachelor's degree, and find no effects. Conclusions: This analysis highlights the differential mental health impacts of US labor market policies among racial groups. The results suggest that minimum wage policy can improve mental health among Black young adults.

11:00 AM –12:30 PM WEDNESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Frangipani

Economic Evaluation of Care and Programs

MODERATOR: **Mercy Mvundura**,

Ind-1693 Cost Analysis of Sexual and Reproductive Health and Rights Services in Kano and Kaduna States, Nigeria

PRESENTER: **Abubakar Yerima Mohammed**

AUTHORS: Kabiru Gulma, Olufunke Fasawe, Gafar Alawode

Background: Access to comprehensive Sexual and Reproductive Health and Rights (SRHR) services remains limited in Nigeria due to supply-and-demand bottlenecks and inadequate public financing. For instance, the Basic Health Care Provision Fund (BHCPF), a key pro-poor health financing reform, covers only 2 of the 9 essential SRHR services defined by the Guttmacher-Lancet Commission. While national and sub-national governments show growing interest in funding comprehensive SRHR services, there is a lack of data on the financial implications of integrating these services into the public health system. This study addresses the gap by employing a bottom-up cost analysis to estimate the unit costs of SRHR services in Kano and Kaduna—covering family planning, maternal health, and STI prevention—and projecting financial requirements under four coverage scenarios (25%, 50%, 75%, and 100%).

Methodology: The study employed a mixed-method approach to estimate SRHR costs from a health systems perspective. A desk review of the Guttmacher-Lancet SRHR framework defined a comprehensive scope of services across nine domains. A workshop with state officials prioritized interventions and service delivery levels (primary or secondary care). Data was collected from 10 health facilities per state (5 primary, 5 secondary), focusing on facilities with functional pharmaceutical units. Additional population and coverage data were gathered from state documents and surveys. These inputs were analyzed using the OneHealth Tool to estimate costs under four coverage scenarios (25%, 50%, 75%, 100%), disaggregated by service type, human resources and capital investments (equipment and infrastructure).

Results: The analysis revealed significant variations in the per capita and total costs of delivering comprehensive SRHR services in Kano and Kaduna States over a five-year period. In Kaduna, the mean per capita cost ranged from N9,524 ($6) at 25% coverage to N17,072 ($10.7) at 100% coverage. In Kano, the mean per capita cost was slightly higher, ranging from N10,457 ($6.5) at 25% coverage to N16,163 ($10.1) at 100% coverage. Total annual SRHR costs in Kano ranged from 36 to 90 billion Naira, with over 55% of the budget allocated to HIV/AIDS and STI services, followed by maternal and child health (MCH) and sexual health services. Similarly, in Kaduna, total annual costs ranged from 20 to 57 billion Naira, with the largest cost share also dedicated to HIV/AIDS and STI services. Additionally, across both states, direct intervention costs, primarily for drugs, consumables, and supplies, account for over 90% of the costs

Conclusion: This study highlights the significant financial investment required to deliver comprehensive SRHR services in Kano and Kaduna States, emphasizing the critical role of direct intervention costs like drugs and supplies. Variations in costs between states reflect differences in service delivery models and demographic factors. These findings provide a strong evidence base to guide health financing reforms and advocate for integrating comprehensive SRHR services into Nigeria's health system to improve equity and access.

Ind-486 Evaluation of a Graded Care Model for Miscarriage in the UK: Results from a Pilot

PRESENTER: **Corneliu Bolbocean**, University of Oxford
AUTHOR: Adam Devall

Background and Objective: The Birmingham Women's Hospital has implemented a novel Graded Model of Care aimed at standardizing the therapeutic approaches for women experiencing miscarriage in the UK. This 'graded' approach encourages healthcare professionals and patients to take action after the first miscarriage and the response is tapered according to the number of miscarriages. Between January 1, and September 12 2024 a total of 260 women who experienced either sporadic (up to two pregnancy losses) or recurrent miscarriage have been enrolled into the study. Participants have completed the EQ-5D-5L, SF-12, cost questionnaire and the iMTA Questionnaires (iMCQ and iPCQ) at baseline, six-weeks and three months follow-up. The pilot aims to enrol a total of 367 women, with assessments scheduled at baseline, six weeks, three months, and six months post-miscarriage. The objective of this study is to evaluate differences in health outcomes and costs by the type of miscarriage as well as to assess cost-effectiveness and overall health economic implications of the Graded Model of Care. **Methods**: Differences in multi-attribute utility scores, and health utilization and healthcare costs were compared across sporadic vs recurrent miscarriages. These differences were ascertained using the Student t-test for unequal variances, Fisher's exact test to assess differences for categorical variables as well as Kolmogorov–Smirnov tests. For the adjusted analysis, we utilised generalised linear models, regression adjustment matching and entropy matching to examine differences by type of miscarriage. Subgroup analysis by age, ethnicity, and occupation was implemented. **Results (preliminary)**: Women diagnosed with recurrent miscarriage compared to those experienced sporadic miscarriage had lower multi-attribute utility score measured using EQ-5D-5L (-0.03, $p<0.042$), and higher overall total costs. Multi-attribute utility scores and total costs showed substantial variation between ethnicity, age, and occupation. **Conclusion (preliminary)**: Recurrent miscarriage is associated with lower overall health-related quality of life, particularly in terms of pain/discomfort and anxiety/depression and usual activities. EQ-5D-5L is likely able to discriminate between women who experienced sporadic vs recurrent miscarriage.

Ind-759 Value Assessment of Subcutaneous Depot Medroxyprogesterone Acetate (DMPA-SC) in Low-and Middle-Income Countries: Using a Cost-Effectiveness Framework

PRESENTER: **Ranju Baral**, PATH
AUTHORS: Marley Gibbons, Mercy Mvundura, Bonnie Keith, Ashley Jackson, Clint Pecenka

Background: The injectable contraceptive, subcutaneous depot medroxyprogesterone acetate (DMPA-SC), is shown to be effective, feasible, and acceptable. DMPA-SC is easy to use, enabling any trained person to administer it, including clients themselves through self-injection (SI). Mainstreaming DMPA-SC and self-injection (SI) within national family planning programs can reach new users, improve contraceptive continuation rates, and reduce burdens on health care providers and facilities. A few studies have evaluated the costs and the cost-effectiveness of DMPA-SC, primarily in pilot implementation settings. However, health economic evidence to inform policy decisions on scaling up DMPA-SC access remains limited in low- and middle-income countries (LMICs). In this analysis we evaluate cost-effectiveness of DMPA-SC self-injection compared to provider-administered injectable contraceptives in three countries: Kenya, Nigeria, and Pakistan. **Methods:** We developed a static decision tree model for a cohort of injectable contraceptive users in each study country over a period of 12 months. The model will estimate the incremental costs per unintended pregnancy averted and the cost per disability-adjusted life year (DALY) averted, both from societal and health systems perspectives. Data on rate of contraceptive continuation and input costs will be derived from peer-reviewed

literature and supplemented by operational data, as available, with inputs from key stakeholders from each country's national family planning program. Cost-effectiveness will be evaluated under several program implementation scenarios such as task-sharing—including with community health workers, and alternative job aids; the quantity of take-home devices for self-injection and intensity of client training time; including value to potential clients in terms of time and resources saved. One-way and probabilistic sensitivity analysis will be conducted to test the robustness of cost-effectiveness estimates. **Results:** This study is currently underway with results anticipated in March 2025. Initial engagements with key in-country stakeholders are ongoing to inform the cost-effectiveness model and the input data parameters. Health systems costs will include both direct and indirect costs. Direct costs will include product, training of health workers and counselors, training materials, and health worker time spent training and counseling. Indirect costs will include client travel expenses and the cost-savings from opportunity cost of traveling to health facility. **Conclusions:** Evidence on cost-effectiveness of public health interventions is critical to inform decisions around their introduction and use. Results generated from this study will fill current gaps in health economic evidence around DMPA-SC in select LMICs which remain crucial for countries' contraceptive method mix prioritization and resource allocation.

Ind-55 A Systematic Review on Health Economic Evaluations of Telemedicine

PRESENTER: **Dr. Cheryl Chong Zhiya, MBBS, MPH**
AUTHORS: Jonathan Chng Jia Hao, Ray Chong Junrui

Introduction Telemedicine has emerged as a viable healthcare delivery model, particularly following the COVID-19 pandemic. Its potential to reduce healthcare costs and improve patient outcomes has garnered significant attention. This systematic review aims to evaluate the existing literature on the economic evaluation of telemedicine interventions. Methods A systematic review was performed based on a systematic search of literature published from 2014 to 2024, conducted in MEDLINE and PubMed, using keywords "telemedicine," "telehealth", "teleconsults", "economic evaluation", "cost-effectiveness", "cost-benefit" and "cost-utility". The search was limited to studies published in English-language journals between 2014-2024. The 10 year publication limit was applied as there has been significant changes and advancements in telemedicine in recent years, and older publications may not be as relevant. The inclusion criteria for the study were studies that discussed telemedicine and its associated costs. Studies which did not discuss telemedicine were excluded. Prior to inclusion, the studies were also evaluated for their relevance and applicability to the research question. Included studies were analyzed for methodology, sample size, data collection methods, and key findings. Results The majority of studies included in this review employed cost-effectiveness analysis to evaluate the economic implications of telemedicine in primary care. However, a few studies also utilized cost-benefit analysis and cost-utility analysis, providing a more comprehensive assessment of the potential benefits and costs. Findings suggest that telemedicine can offer economic advantages compared to traditional in-person consultations. This is particularly evident for certain conditions and patient populations, such as those with chronic diseases or limited mobility. However, the extent of cost savings varies across studies, highlighting the importance of considering specific contexts and patient characteristics. Conclusion Various economic evaluation methods performed in a variety of contexts suggest the advantages of telemedicine. Factors such as the type of condition, the complexity of care, and the implementation of telemedicine services can influence the economic benefits realized. Therefore, further research is needed to establish the long-term cost-effectiveness of telemedicine in different primary care settings and for diverse patient populations.

Ind-545 The Impact of Surgical Robotics on Surgical Risk and Uncertainty: A Comprehensive Economic Evaluation

PRESENTER: **Ermo Chen**

The widespread adoption of surgical robotics in clinical practice stands in stark contrast to the inconsistent findings in health technology assessment (HTA) studies. This divergence likely stems from the inability of mean-based HTA tools to capture the risk mitigation capabilities of surgical robotics. While surgical robotics may not fundamentally alter the clinical mechanisms of certain surgeries, their standardization and stability mitigate the inherent uncertainties of human actions, potentially leading to more consistent outcomes. This distributional aspect of outcome warrants discussion in HTA evaluations.

This paper evaluates the impact of introducing surgical robotics in healthcare institutions on the risk and uncertainty of service outcomes. The variation in hospital stay duration, clinical outcomes, postoperative complications, clinical errors, and intervention costs are all incorporated into the assessment. Utilizing service records from a market-dominant surgical robotics supplier and statistical data from an IT provider covering over four thousand hospitals in China, a sample set of 4,231 hospitals with 30,936 hospital-quarters, covering 15 years (2007 - 2022) and 29 provinces, is analyzed in this paper.

To analyze the overall effect on hospitals by introducing surgical robotics, the evaluation is made on model points made of hospital-quarters, as only grouped attributes contain distributional information. A time-varying difference-in-differences approach is introduced to identify the causal effects of introducing surgical robotics. A mixed causal inference test is used to ensure robust conclusions. Additionally, we developed a novel generalized linear regression method tailored for variance decomposition, which is proposed for a coherent framework of uncertainty analysis.

Empirical results indicate that, for each 1% increase in the proportion of surgeries performed by surgical robots, it leads to a 0.0288% (p-value: 0.018) reduction in surgical mortality rates, with no significant change in hospital stay duration. Also, there is a 2.12E-6 (p-value < 0.001) reduction in the rate of surgical errors and a 6.19E-6 (p-value: 0.009) reduction in postoperative complications for each 1% increase in the proportion of surgeries performed by surgical robots, at the cost of a $369.26 (p-value < 0.001) increase in average intervention cost.

In conclusion, this paper shows that the introduction of surgical robotics significantly reduces surgical mortality rates and substantially diminishes the uncertainty associated with medical errors and postoperative complications. These benefits are under a considerable but

acceptable cost. These findings underscore the importance of considering the risk-mitigating aspects of surgical robotics in economic evaluations of this health technology, which may lead to more consistent HTA findings.

Ind-1140 Evaluation Cost-Effectiveness of Importing Metagenomics in China ICU Surveillance: The Acute Respiratory Distress Syndrome Modelling Analysis

PRESENTER: **Zhongzhou Yang**
AUTHORS: Liwei Diao, Haiyan Zhang, Eric HY Lau, Na Liu, Shaolin Liang, Yang Yang, Yu Cheng, Yanru Guo, Yinhua Zhou

Introduction: Though the rapid pathogen investigation metagenomics (mNGS) is available in China's independent clinical laboratory (ICL), it has yet been introduced into the surveillance and is hence not accessible to ICU pneumonia inpatients.* *This study targeted to evaluate the cost-effectiveness of incorporating mNGS in high mortality acute respiratory distress syndrome (ARDS) from pneumonia inpatients.* ***Methods:*** *We developed a decision-tree model to estimate the cost-effectiveness of incorporating mNGS into the Clinical laboratory department for ARDS in hospital ICU (CAI) compared to the conventional culture followed by Consolidated Health Economic Evaluation Reporting (CHEERS) guidelines.** ARDS mortality was sourced from the Clinical Diagnosis and Prognosis by Severe Pneumonia (CDPSR) study, whereas incidences were sourced from the prospective Incidence and Outcomes Multicenter Prospective Longitudinal (IOMPL) cohort. The model accounted for three scenario combinations: scenario 1(100% culture), scenario 2 (100% mNGS), scenario 3 (both culture and mNGS). The number of ARDS death, incremental cost per death averted and TAT were estimated at the provincial levels. Both DSA and PSA were conducted to investigate model uncertainty. **Results:** Compared with baseline scenario 1, mNGS prominent inpatient for scenario 2 would reduce 1843 ARDS death (25%), shorten 600,883 turnaround time (TAT) days and $39,595 per death averted among the standardized 100,000 pneumonia inpatients, with two cost-effective regions among 13 regions. Compared with scenario 1, performing the scenario 3 would avert 814 ARDS deaths (11% reduction) and extended 265,590 TAT days on $14,791 per death averted among 100,000 pneumonia inpatients and more effective, if the scenario 3 achieved 55% culture and 45% mNGS. Two comparisons implied the robust results when fluctuating all 26 model parameters, which PSA showed the most influential parameter was probability from ARDS to ICU death and mNGS cost might reduce $170 to the merit for TAT. **Conclusion:** Our findings emphasize the cost-effectiveness of incorporating mNGS in China ARDS surveillance. Regional findings supported the optimal import of mNGS priority should be provided to pneumonia inpatients. 1

Ind-1815 Estimating the Societal Willingness-to-Pay per Quality-Adjusted Life Year to Aid Health Technology Assessment in India

PRESENTER: **Yashika Chugh**
AUTHORS: Gaurav Jyani, Aarti Goyal, Sitanshu Kar, Binod Kumar Patro, Mayur Trivedi, Sandra Albert, Prakash Singh, Swati Raman, PVM Lakshmi, Kavitha Rajsekar, Cam Donaldson, Shankar Prinja

Objective: The study aimed to estimate the willingness to pay (WTP) for a quality-adjusted life year (QALY) to help determine the threshold for cost-effectiveness in India. We also assessed the factors affecting WTP/QALY. *Methods:* We used a multi-stage stratified random sampling strategy to select 5460 respondents across six Indian states. Participants were interviewed to gather household socioeconomic and demographic data, followed by assessments of health gains using time trade-off (TTO) and WTP. Respondents were presented with 12 hypothetical health states to gauge health gains and their WTP to restore health. These values were combined to determine WTP per QALY using an aggregated approach. Weighted estimates based on state, residence, gender, age, and education were computed. A mixed-effect regression model explored the relationship between socio-demographic variables and WTP/QALY. *Results:* Based on 21,640 observations, we found that mean weighted WTP/QALY was estimated to be INR 2,12,307 (USD2,535) which is 1.24 times the gross domestic product (GDP) per capita. Based on the different health states, the WTP/QALY ranged from USD 2,034 for mild conditions to Rs. USD 3,092 for severe health conditions. Health state utilities ranged from 0.156 (advanced lung cancer) to 0.846 (mild allergy). Age, gender, family size, education, marital status, occupation, presence of health insurance, consumption expenditure, and number of earning members in the household significantly impacted WTP per QALY. *Conclusion:* Our study reports the first-ever estimate of WTP/QALY for the Indian population. The WTP/QALY ranges from 1-1.52 times the GDP per capita. This is a valid estimate for setting a cost-effectiveness threshold for health technology assessment in India.

Ind-2641 Beyond Realist Evaluation: Review of theory-informed Economic Evaluation: Evidence From Published Realist Economic Evaluation

PRESENTER: **Olawale Joshua Oladimeji**, Obafemi Awolowo University
AUTHORS: Tim Tenbensel, Karen Bissell, Paula Lorgelly

Realist Economic Evaluation (REE) is a developing methodology in health economics that builds on the existing knowledge and principles of both realist evaluation and economic evaluation. Applying a realist approach to analyze economically sensitive program theories may elicit limited findings because the underpinning concepts of realism are not structured to explore the cost and consequences of health interventions. A limitation of economic evaluation when applied to complex health interventions includes a minimal focus on how or why the outcomes were produced and how context and mechanisms affect cost-effectiveness. These are some key limitations the REE approach attempts to address by providing a theory-informed economic evaluation that would generate comprehensive evidence for policymakers. Over the last ten years, there has been a gradual increase in published literature related to the realist economic evaluation approach. However, no review of the realist economic evaluation studies has been conducted. This scoping review aims to determine how realist economic evaluation is applied in the health system space, justification for the use and identify the methodological challenges while applying this approach. **Methods:** We started our scoping review with terms such as theory-informed, complex theory, economic evaluation, theory-driven, and realist evaluation. Our initial Scopus search results showed that the search strategy was neither specific nor sensitive. It led to a very large number of publications that were not relevant and missed important papers we already knew. We reviewed Mesh vocabulary and definitions to improve the sensitivity and specificity. We interchangeably added the terms theory-informed economic evaluation, theory-driven economic evaluation, and realist economic evaluation. This resulted in 218 initial hits. These were reviewed based on the set inclusion and exclusion criteria, such as conceptual or

theoretical papers, studies reporting on health system research, papers published in English language and over the last ten years. The review was concluded in September 2024. **Findings:** We found 8 papers published between 2016 and 2023. All the studies were either United Kingdom- or Australia-based. There was some diversity in the justification for the use of REE, such as the opportunities to combine the benefits of realist and economic evaluation approaches in research, to explore economically related and non-related contextual factors and mechanisms, and being able to address the questions of what works for whom, how and under what circumstances while exploring resource use and cost. A lack of firm methodological guidance because it is a new approach was reflected in the findings. **Conclusion:** The realist economic evaluation approach is relevant in evaluating complex health interventions. However, there is diversity in the justification for its application. More clarity on methodological guidance and application in complex interventions that are cross-cutting in health systems will expand its use in research methods and policymaking.

Ind-1847 The Cost and Cost-effectiveness of a Cash Transfer Plus Economic Empowerment Intervention for Promoting Caregiver Wellbeing in South Africa

PRESENTER: **Darshini Govindasamy**, MRC South Africa
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Background: The wellbeing among caregivers of children and adolescents living with HIV/AIDS (CALHIV) was compromised during COVID-19, further widening health, gender and economic inequities. As part of South Africa's post-pandemic recovery policy to improve wellbeing among the most vulnerable, national roll-out of the COVID-19 Social Relief of Distress (SRD) grant continues. Leveraging the SRD grant through combining it with a caregiver-centered gender-transformative economic empowerment programme could amplify the policy's wellbeing effects for caregivers. Given constrained HIV/AIDS budgets, understanding the delivery costs and wellbeing gains will support the investment case for prioritising caregivers of CALHIV in pandemic recovery efforts. We report on the cost and cost-effectiveness of the caregiver wellbeing Plus (CWEL+) intervention, comprising a cash transfer, resembling South Africa's SRD grant, plus a gender-transformative economic empowerment programme.

Research question: Is the CWEL+ intervention a cost-effective strategy for South Africa's post-pandemic relief policy?

Methods: The CWEL+ intervention was evaluated via a two-arm pilot cluster-randomised trial, conducted between July 2023-July 2024 with women caregivers (n=273) from 20 HIV clinics (10 clusters per arm) in the eThekwini Municipality, KwaZulu-Natal, South Africa. Intervention clusters (n=149 caregivers) received a monthly cash transfer to the value of the SRD grant (US$19) and the gender-transformative economic empowerment programme over 6-months. Control clusters (n=124 caregivers) only received the monthly cash transfer (US$19). The primary outcome was change in psychological wellbeing (measured using the Mental Health Continuum-Short Form) at 7-months follow-up. We conducted prospective cost data collection from intervention manual development through to delivery of the trial. Cost data were obtained from multiple sources (project accounts, trial database, time-and-motion study). The costing analysis was conducted from a provider perspective. We estimated the average cost per increase in psychological wellbeing score by arm. We fitted a Markov model to estimate the incremental cost effectiveness ratio (ICER) in terms of quality-adjusted life years gained in the long-run and assessed robustness of results via a one-way sensitivity analysis. All costs were reported in 2023 USD ($).

Results: Among the sample, the mean age was 37 years (SD: 9.06), with a high prevalence of HIV (84%), unemployment (99%), low to moderate psychological wellbeing (52%), and intimate partner violence (63%). Socio-demographic characteristics were balanced across arms. We found an increase in psychological wellbeing in the intervention versus the control arm (β=3.17, 95% CI:1.35, 5.00). The average provider cost per participant was higher in the intervention (US$ 575) versus the control (US$ 121) arm, largely driven by variable costs such as venue and staffing for the empowerment sessions. The ICER was US$1,413 suggesting that the CWEL+ intervention is cost-effective as below the threshold of <3 x South Africa's 2023 gross domestic product per capita of $6,018. Results were robust to changes in model parameters.

Conclusion: Our findings demonstrate that augmenting South Africa's SRD grant with a gender-transformative economic empowerment programme is cost-effective and a potentially affordable strategy to improve caregiver wellbeing in pandemic recovery efforts. A larger scale trial incorporating a cost-benefit analysis is needed to confirm results.

Ind-2186 Methods for the Economic Evaluation of Health Impacts of Climate Action: When, Why, and How Best to Use Them? A Literature Review

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Background and Motivation: Climate action holds the promise of delivering significant health benefits, including increased life expectancy, improved quality of life, and enhanced global well-being. Despite this potential, there is no standardized methodology to quantify these health impacts and assess the cost-effectiveness of climate action interventions throguh economic evaluation frameworks. This review seeks to address this gap by analysing frameworks from health economics and environmental economics that assess the economic value of health co-benefits from climate action. The objective is to guide policymakers toward adopting consistent and evidence-based methods to prioritize interventions that yield both environmental and health benefits. **Methods:** A systematic literature review was conducted to explore the research landscape on the economic evaluation of health impacts arising from climate action. Policy reports and grey literature were also reviewed to ensure comprehensive coverage. Methodological frameworks from health and environmental economics were compared to evaluate their respective strengths, limitations, and gaps in capturing health co-benefits in climate policy assessments. **Results and Expected Contribution:** Preliminary findings suggest that health economics provides detailed and robust methodologies for quantifying health outcomes, but these methods are often underutilized in climate policy evaluations. Conversely, environmental economics offers a broader assessment of climate impacts but frequently lacks standardized and rigorous health metrics aligned with health economics frameworks. This review synthesises these insights to propose an

integrated framework for evaluating the economic value of health co-benefits in climate policies. **Conclusion:** This study lays the groundwork for advancing economic evaluations of health impacts in climate action. By integrating approaches from health and environmental economics, the findings aim to inform policymakers in designing evidence-based, systematic, and coherent climate policies that reflect both economic and health benefits.

Ind-2664 The Cost-Effectiveness of Social and Behavior Change Interventions and Cessation Services in Reducing Alcohol-Related Health Harms in the Philippines

PRESENTER: **Andrea Margreth Ora-Corachea**

Background: No level of alcohol consumption is without risk. According to the World Health Organization (2023), there is no safe level of alcohol consumption; even at low levels, there are potential risks to human health, including an increased risk of cancers, liver diseases, and cardiovascular problems. In the Philippines, alcohol consumption is one of the leading risk factors for combined death and disability, with 3.1% or approximately 27,477 Filipino deaths attributable to alcohol in 2021 (Global Burden of Disease [GBD], 2021). National policies have been enacted to improve health outcomes linked with alcohol consumption, including Sin Tax Reforms, the Anti-Drunk Driving Act, and the Mental Health Act. Despite these measures, between 2015 and 2021, the Philippines consistently recorded that about half (48.4%) of its adult population and at least 1 in every 10 adolescents (14.9%) are current alcohol drinkers. It is estimated that alcohol consumption costs the government about PhP 200 billion annually, with the majority spent on treating individuals with alcohol problems.

Objective: The study aims to assess the cost-effectiveness of instituting social and behavior change interventions and alcohol cessation services to avert alcohol-related harms in the Philippines.

Methods: A mixed-method approach combining policy analysis and economic evaluation was employed. The policy analysis assessed the public health impact, budgetary impact, and operational and political feasibility of four policy options: (1) status quo (ad hoc education campaigns integrated into health messaging during major celebrations or holidays), (2) social and behavior change campaign, (3) alcohol cessation services, and (4) combination of the social and behavior change campaign and cessation services. A Markov model was used to estimate costs, disability-adjusted life years (DALYs), and the incremental cost-effectiveness ratio (ICER) from a public health perspective. The base case model assumes a lifetime horizon, with a 3.66% annual discount rate applied to future costs and benefits.

Results: Analysis of the policy options shows that implementing social and behavior change interventions, cessation services, or their combination would yield significant public health impact, albeit with substantial budgetary requirements. The cost-effectiveness analysis indicates that implementing the combined strategy of social and behavior change communication and cessation services yields the highest ICER, within the willingness-to-pay threshold.

Conclusion and Policy Implications: The study underscores the importance of a comprehensive program that delivers a package of health interventions—ranging from health promotion to treatment and rehabilitation—aimed at reducing the prevalence of alcohol consumption and its associated morbidity and mortality. The findings will offer evidence-based recommendations on the cost-effectiveness of implementing various policy interventions across the continuum of care and guide resource allocation, including the potential development of a social insurance benefit package for alcohol prevention and control. These findings may also serve as a reference for other low- and middle-income countries seeking to implement policies to reduce alcohol consumption and its related harms.

Ind-145 Economic Evaluation of Caregiver Interventions for Children With Developmental Disabilities: a scoping review

PRESENTER: **Angela Kairu**

AUTHORS: Edwine Barasa, Amina Abubakar, Rosa Hoekstra, Charles Newton, Edwin Dzoro, Vibian Angwenyi, Charlotte Hanlon

Introduction Globally, families with children with developmental disabilities (DDs) may experience several challenges, including social isolation, stigma, and poverty especially in low-income settings in Africa. Most children with DDs in Africa remain unidentified and receive no formal support. Caregiver interventions focusing on education and training for carers of children with DDs have been shown to be adaptable and low intensity in implementation. However, economic evaluation evidence on caregiver interventions for DD, which is important for effective resource allocation, is limited. This review aimed to describe the nature of evidence available and methodological aspects of economic evaluations for caregiver interventions for DDs. **Methods** This scoping review employed the Arksey and O'Malley framework and aligned with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). Seven electronic databases, grey literature and cited references were systematically searched to identify eligible studies on economic evaluations of caregiver interventions for children with DDs published in 1993-2024. We assessed the quality of the included studies using the Drummond checklist. Data were systematically extracted, tabulated, and qualitatively synthesised using inductive thematic analysis. **Results** The searches yielded 7811 articles. Twenty studies all in high-income countries met the inclusion criteria which focused on caregiver interventions for autism spectrum disorder (n=7), attention deficit hyperactivity disorder (ADHD) (n=6), disruptive behaviour and behaviour problems with ADHD (n=5), intellectual disabilities (n=1) and language delay (n=1). The most used economic evaluation approach was trial based models (n=14), followed by decision analytic models (n=5)). The methods were not explicitly stated in 1 study. Economic evaluation analyses included cost effectiveness (n=11), costing (n=3), cost utility (n=2), cost consequence (n=1) cost benefit (n=1), and combined analyses (n=2). Nine studies reported the interventions as cost effective, five studies reported the intervention to be cost saving, and one identified caregiver costs as a cost driver. The main identified methodological challenges were related to costing, outcome measurement in children and the appropriate time horizon for modelling. **Conclusion** Caregiver interventions demonstrate cost-effectiveness, with the available evidence supporting the adoption of the interventions evaluated. Caregiver interventions are a promising avenue to strengthen access and reduce costs associated with health services for children with DDs. Additionally, this review identified key methodological challenges and highlighted areas for further research to address these limitations. Prioritizing more economic evaluation studies in this area would inform decision-making on efficient resource allocation, promote inclusivity and equitable access to services for children with DDs. **Key words:** developmental disabilities, caregiver

interventions, economic evaluation, scoping review

Ind-331 The Cost of Eating Disorders for Australia's Health System: A Linked Health Administrative Data Analysis from 2005 to 2019

PRESENTER: **Moin Ahmed**
AUTHORS: Kelly Dann, Stephen Touyz, Jane Miskovic-Wheatley, Amy Hannigan, Sarah Maguire, Francisco Schneuer, Natasha Nassar, Morgan Sidari, Michelle Cunich

Background and objective Eating disorders (EDs) are serious, complex psychiatric disorders that lead to significant health and psychosocial complications, along with increased mortality rates. In particular, EDs are a concern for healthcare administrators due to the associated severity of effects on physical and mental health, critical and complex healthcare needs, and high costs to health systems. However, there is a lack of studies investigating the health system cost of EDs and its trend using linked health administrative data in Australia. To address this research gap, this study aims to estimate the annual hospital costs (hospital admission, emergency department visits, outpatient/clinic visits) for people with EDs in New South Wales (NSW) and Queensland (QLD) from 2005 to 2019. Further, it also investigates the main factors of these healthcare costs in the two states using econometric methods. **Methods** Several linked health administrative health datasets in NSW and QLD, including hospital data, emergency department data, and outpatient data from 2005 to 2019, are used for this study. Individuals with EDs are identified from data using relevant ICD-10 AM (F50.x), ICD 9 CM and SNOMED CT AU diagnostic codes. A healthcare provider perspective using a bottom-up costing method is utilised to estimate annual costs. Costs are standardised to Australian dollar ($) 2024. Multiple regression analysis (two-part model) is used to estimate the marginal cost due to EDs, and to identify the factors associated with these healthcare costs. **Results** This study will be the first to examine the longitudinal trends in, and factors for, the various hospital costs associated with EDs in two of the most populated states in Australia, NSW and QLD. Results will reveal variations, if any, in healthcare costs over the study period, and by types of EDs, by estimating annual average cost per patient and annual total cost. The analysis will show the share of cost for hospital admissions, outpatient visits and emergency department visits. The study will also identify the influence of demographic factors, socioeconomic status, and remoteness of residence on the cost distribution. Trends over time will reveal an overall pattern in costs, indicating changes in demand for healthcare services related to EDs. **Conclusions** The findings from this study will highlight priority areas for policy intervention/ resource allocation by identifying variations in costs across hospital services, demographic factors, socioeconomic status and geographic remoteness. Such information can be used by healthcare executives and policymakers to make decisions regarding the optimum allocation of resources within the health sector. Up-to-date estimates of the hospital costs provided in this study can also be used in economic evaluations of preventive and treatment strategies designed to improve the quality of life of people with EDs in a cost-effective way. **Keywords:** healthcare cost; health system cost; economic cost; eating disorders; Australia

Ind-604 Community Action for Health in India: At What Cost?

PRESENTER: **Apoorva Nambiar**
AUTHORS: Neymat Chadha, Devaki Nambiar

Community Action for Health (CAH) initiatives are integral to India’s public health strategy, enabling community involvement in setting health priorities, delivering services, and monitoring health outcomes. Despite their recognised impact, there remains limited understanding of the financial dimensions of CAH, particularly the range of costs borne by stakeholders such as government bodies, NGOs, and local communities. Existing studies lack a detailed breakdown of these costs, posing challenges for policymakers and health planners in assessing the sustainability, scalability, and cost-effectiveness of CAH programs. To address this critical gap, this study, for the first time, develops a comprehensive costing framework that captures the full spectrum of costs associated with CAH initiatives across India’s diverse socio-economic and geographic contexts. This framework encompasses direct, indirect, fixed, and variable costs, providing a structured view of resource allocation. Guided by the question, “At what cost are CAH initiatives implemented in India?” this study employs a realist review methodology, synthesizing data from peer-reviewed literature on CAH alongside empirical program-specific cost data from multiple Indian states. The framework includes core cost components spanning human resources (e.g., salaries for civil society implementers, Accredited Social Health Activists, Auxiliary Nurse Midwives, stipends for community health volunteers), infrastructure (e.g., office and space rental, health center upgrades, maintenance costs), service delivery (e.g., preparatory and final meeting costs, health (information) kits and materials, other coordination activities and outreach), monitoring and evaluation (e.g., data collection tools, feedback mechanisms), and community engagement (e.g., inclusion of awareness materials, ancillary support provided to communities (like childcare), support for cultural events), among others. Costs are systematically categorized as fixed or variable, direct or indirect, based on their frequency and type, offering a detailed picture of financial responsibilities and burdens across stakeholders, including lay, state, and community actors. Preliminary findings also indicate substantial cost differences across regions. For instance, transportation costs are notably higher in rural and remote areas with challenging terrain, while human resource costs fluctuate due to state-specific salary scales, socio-economic factors. Region-specific analysis reveals both actual costs, representing immediate expenditures, and normative costs, reflecting the resources ideally required to meet program goals effectively. Substantial indirect costs, such as NGO staff, and community volunteer time and opportunity costs, place a considerable financial burden on community members and local organizations supporting CAH activities. By providing a structure, itemized view of CAH costs within an adaptable framework, this study holds significant implications for policy and practice. The framework provides policymakers and health economists with a practical tool for evaluating financial sustainability, optimizing resource allocation, and making data-driven decisions to strengthen CAH programs. In highlighting areas for potential cost savings and equitable funding strategies, this research underscores the importance of integrating economic evaluations into community health planning to develop sustainable, scalable, and equitable CAH programs. Furthermore, this framework serves as a replicable model for economic assessments of similar community-based health interventions, contributing to a deeper understanding of the financial realities of participatory health programs.

Bali International Convention Centre – Bandung

Financing Emergency Response and Preparedness

MODERATOR: **Gavin Surgey**,

Ind-1514 Optimizing the Procurement of Covid-19 Vaccines: A Case for a Pooled Procurement Model for Medical Supplies in the Asia-Pacific

PRESENTER: **Udeni De Silva Perera**
AUTHORS: Kaung Mon Winn, Maame Esi Woode, Benjamin Coghlan

Background: The COVID-19 pandemic exposed significant gaps in global health systems and timely access to medical products including vaccines by low- and middle-income countries. Unlike countries that benefited from pooled procurement mechanisms, countries in the Asia-Pacific (APAC) region found it difficult to secure sufficient COVID-19 vaccines and at reasonable prices.

Methods: Using data on vaccine volumes, prices and coverage from verified sources, this study explores the COVID-19 vaccine procurement mechanisms in the APAC region and its impact on health outcomes, comparing it with those in the Latin America and the Caribbean (LAC) region, where countries benefited from existing pooled procurement mechanisms through the Pan American Health Organization (PAHO).

Results: Results indicate that countries in the LAC collectively procured more vaccine doses per 100 population, particularly in 2021 (10.8 doses/100 for LAC countries compared to 9.3 doses/100 for APAC). In terms of procurement cost, the highest average per-capita cost over 2021-2023 period within the LAC region was recorded in Colombia (US $5.24); considerably lower than the highest average per-capita cost recorded within the APAC region (US $7.48 for Tuvalu). Significant heterogeneity in prices paid for different COVID-19 vaccine brands, across the two regions was observed with some APAC countries paying significantly higher prices, per dose for certain brands, across 2021-2023. Using hierarchical mixed effects models, we show consistently stronger positive impact of COVID-19 vaccine coverage on daily case fatality rate and mortality within the LAC region with even stronger results observed for lower-middle income countries.

Conclusions: Overall results suggest that countries in the APAC region could have realised cost savings and improved health outcomes through a collaborative procurement mechanism during the pandemic.

Keywords: Vaccine procurement, COVID-19, regional cooperation, Asia and the Pacific, Latin America and the Caribbean, Pan American Health Organization

Ind-622 Utilizing the WHO's System of Health Account Dimension for Tracking the Financial Flows of Indonesia's COVID-19 Vaccination Program

PRESENTER: **Olivia Herlinda**, Center for Indonesia s Strategic Development Initiatives (CISDI)
AUTHORS: Ayudina Larasanti, Sayyid Muhammad Jundullah, Sinta Amalia Kusumastuti Sumulyo, Indra Yudha Mambea

Introduction: The COVID-19 vaccination program is essential for preventing the spread of COVID-19, and it requires dedicated funding to ensure equitable vaccine access. Despite available funding mechanisms for the COVID-19 vaccination program, disparities remained in certain areas. This study aims to track the source, allocation, and utilization of province and district-level expenditures on the COVID-19 vaccination program in order to discover financial gaps that affected coverage. **Methods:** This study used a mixed-methods approach using dimensions of the system of health account (SHA) framework to track expenditure of Indonesia's COVID-19 vaccination program. We collected expenditure data and conducted in-depth interviews from four provincial health offices (PHOs) and four district health offices (DHOs) in Indonesia. To gather more comprehensive insights, three focus group discussions (FGDs) were held with ministries and government agencies, subnational bodies, and civil society organizations. **Results:** Expenditure tracking is classified through the dimensions of the SHA framework, including financial sources, healthcare functions, programs, health activity, and health input. The results of expenditure tracking show that the COVID-19 vaccination program in Indonesia is primarily covered by the national or regional budget. The largest expenditures generally included funding for the cold chain, distribution, vaccinator incentives, and per diem. **Discussion:** There is variation in the expenditure for the COVID-19 vaccination program across subnational levels based on factors such as government fiscal capacity, institutional capacity, and geographical barriers. Numerous factors other than the amount of health expenditures can influence the outcomes of health programs, including maximizing the involvement of the private sector, which are essential elements. **Conclusion:** This study found that Indonesia's complex health financing mechanism, coupled with limited fiscal capacity, struggles to ensure equitable vaccination delivery, especially in underserved areas. The budget transfer process from central to subnational levels is inadequate to account for vulnerabilities like geographical challenges. These disparities underscore the need for more coordinated and flexible health financing mechanisms during pandemics. Developing resource allocation guidelines and improving national-to-local resource distribution during health crises are essential for better outcomes. **Keywords:** Expenditure, COVID-19, Vaccine, Health, Government, Financing

Ind-2119 The Role of Public Financial Management in Strengthening Health Emergency Preparedness and Response

PRESENTER: **Jacopo Gabani**, University of York

Background: The emergence of global pandemics such as COVID-19 has underscored the critical importance of robust public financial management (PFM) systems in health crisis preparedness and response. Effective PFM enables governments to mobilize, allocate, and utilize

financial resources efficiently and transparently, which is essential for timely intervention during health emergencies. This study investigates how PFM practices enhance or hinder health emergency preparedness and response and provides. **Methods:** The study develops a logical framework on how PFM relates to health emergency preparedness and response. A systematic literature review of publications from 2000 to 2023 was performed, sourcing articles from databases including PubMed, Scopus, and the World Bank Repository. The review focused on PFM components such as budgeting flexibility, procurement processes, expenditure tracking, and financial accountability in the context of pandemics. Additionally, case studies of countries affected by recent pandemics (e.g., SARS, H1N1, Ebola, and COVID-19) were examined to assess practical applications and outcomes of PFM strategies during health crises. Findings from the literature review and case studies were applied to dimensions mapped out in the logical framework. **Results:** The study found that countries with agile and transparent PFM systems demonstrated more effective pandemic responses. Key findings include: - **Budget Tagging:** Identifying what interventions across sectors relate to health emergency preparedness in the budget preparation process helps foster political support and prioritization during quiet years. - **Surge Financing Capacity and Budget Flexibility:** Countries with mechanisms for emergency funding and reallocation of budgets were able to respond more swiftly to emerging health needs. Flexible budgeting practices allowed to act as a first line of defense for the rapid deployment of resources to critical areas such as healthcare infrastructure, personnel, and vaccine procurement. - **Efficient Procurement Processes:** Streamlined procurement regulations facilitated quicker acquisition of essential medical supplies and equipment. Countries that adapted their procurement laws to allow for emergency procedures avoided delays commonly associated with standard bureaucratic processes. - **Financial Accountability and Transparency:** Strong oversight and audit systems mitigated risks of corruption and mismanagement of funds. - **Intersectoral Coordination:** Effective collaboration between ministries of finance and health, along with other stakeholders, improved resource mobilization and allocation. Integrated PFM and health planning resulted in more coherent and comprehensive pandemic responses. Challenges identified included rigid budget structures that limited rapid funding allocation, complex procurement regulations causing delays, and insufficient financial management capacity within health ministries. **Conclusion:** Strengthening PFM systems is crucial for enhancing health emergency preparedness and response capabilities. Key recommendations include adopting flexible budgeting practices, streamlining procurement processes, enhancing financial accountability mechanisms, and fostering intersectoral collaboration. By addressing these areas, governments can improve their ability to respond effectively to health emergencies, minimize economic disruptions, and save lives. Policymakers should prioritize PFM reforms that enable swift action during crises without compromising transparency and accountability. Investing in capacity building for financial management within the health sector and leveraging technology for better expenditure tracking can further enhance preparedness.

Ind-1539 Understanding the Financial Hardships Faced by TB and HIV Patients during the COVID-19 Pandemic: a Mixed-method Study in Indonesia

PRESENTER: **Nasser Fardousi**
AUTHORS: Srila Nirmithya Salita Negara, Siska Dian Wahyuningtias, I. Wayan Cahyadi Surya Distira, Riris Andono Ahmad, Yusuf Ari Mashuri, Virginia Wiseman, Ari Probandari, Marco Liverani, Qinglu Cheng, Yanri Yanri Wijayanti Subronto, Hasbullah Thabrany

Abstract

Introduction

The COVID-19 pandemic had major financial impacts on patients with tuberculosis (TB) and human immunodeficiency virus (HIV) globally, reducing household income, increasing unemployment, and disrupting the availability of health services. However, research on the financial difficulties faced by HIV and TB patients in Indonesia during the pandemic is limited. Indonesia provides an opportunity to address this limitation as the country had the highest number of COVID-19 cases (6,815,156) among Southeast Asian countries while also dealing with the dual burden of HIV and TB. This study examines the catastrophic health spending and determinants of out-of-pocket costs during the pandemic. Further, it explores patients' financial hardship experiences and coping mechanisms in two major cities in Indonesia. The results are expected to inform the design of resilience-building approaches for TB and HIV programs.

Methods

This study employed a parallel convergent mixed-method approach involving a quantitative analysis of out-of-pocket (OOP) costs and qualitative interviews. Out-of-pocket costs were recorded using diaries. The incidence of catastrophic health spending (CHS) was defined as the sum of direct medical and non-medical costs that exceed 10% of a household's annual income. The determinants of incurred health costs were investigated using a two-part mixed-effect model regression, whereby the first part models the probability of incurring any OOP costs, while the second part evaluates the intensity of expenditure among those who incurred any costs. We collected qualitative data using in-depth interviews with TB and HIV patients and healthcare workers to document financial challenges and strategies to mitigate and adapt to financial stressors. Data were collected between January and October 2022.

Results

In our sample of 409 patients, 5.13% [95%CI: 2.99 - 7.28] of the households incurred costs exceeding 10% of the household's annual income. The median direct cost was USD 8.48 [Interquartile range (IQR): 2.76-21.89], with non-medical costs comprising the majority of expenses, at a median of USD 5.93 [IQR: 1.82-11.58], especially transport costs at USD 2.56 (IQR: 0.61-6.06). Predictors of higher spending included being located in the city of Yogyakarta (adjusted effect 23.84 [95% CI: 9.90-37.77], p-value=0.0008); seeking care from public hospitals (17.37 [8.83-25.90], p-value<0.001), and being uninsured (10.49 [2.40-18.58], p-value= 0.0110). Job loss due to lockdowns and subsequent disqualification from the national health insurance scheme were perceived as major factors contributing to financial hardship. We documented several coping strategies, such as borrowing from relatives or friends, relying on contributions from family and friends, and selling assets.

Conclusion

Our study reveals that during the pandemic, some households with HIV and TB patients faced financial stressors, including catastrophic health costs and loss of income. Measures can provide better financial protection by targeting poorer households and individuals experiencing job loss. Further research is needed to develop interventions that address these difficulties and enhance national health system preparedness while maintaining financial support for those impacted. 1

11:00 AM –12:30 PM WEDNESDAY [Evaluation Of Policy, Programs And Health System Performance]

Bali International Convention Centre – Dahlia

Population Level Impact of National Health Policies and Trends

MODERATOR: **Marisa Domino**,

Ind-2189 Examining the Health Legacy of the NHS: Short- and Long-Term Effects on Infant Mortality and Adult Health Outcomes

PRESENTER: **Nicolau Martin Bassols**

This paper examines both the short- and long-term health impacts of the introduction of the National Health Service (NHS) in the United Kingdom in 1948. The NHS revolutionized the healthcare landscape by providing universal healthcare free at the point of use. We examine the effects of the NHS's provision of free hospital access for childbirth on children born just before and after its implementation. Using a Regression Discontinuity Design (RDD), we analyze both infant mortality rates at the time of the NHS implementation and health outcomes measured at later ages (45 to 80), including self-reported health, BMI, and obesity rates. Our study uniquely incorporates genotypic data to capture and correct for survival bias, which has been previously overlooked. By using polygenic indices (PGIs), we enhance the precision of our estimates and account for the influence of genetic predispositions on health outcomes. Using data from the General Registrar of Statistics, we show that the NHS significantly improved infant mortality rates in the short run. The children who would not have survived unless delivered at hospital facilities were likely the most vulnerable. We explore this hypothesis by comparing the prevalence of polygenic indices in individuals born before and after the NHS. Using the nationally representative sample from the English Longitudinal Study of Ageing (ELSA) and the large sample sizes of the UK Biobank, we find that post-NHS, there is a higher prevalence of individuals with higher loads in PGIs associated with 'detrimental' phenotypes, such as migraine or chronic pain, while there is a lower proportion of those with 'beneficial' phenotypes, such as general cognition, educational attainment, and IQ. The effect sizes are large, ranging from 10-40% of a standard deviation, and significant at the 95% confidence level. These results remain robust across different bandwidths, kernels, quadratic fits, multiple hypothesis testing, and comparisons of observed versus randomized treatments. Finally, we explore the longer-term impacts of the NHS and examine health outcomes measured between ages 45 and 80. Our findings indicate that the NHS led to improvements in self-reported health, BMI scores, and obesity rates. Interestingly, we find that including PGIs as control variables helps correct for survival bias and enhances precision. Overall, these results suggest that incorporating genetic information accounts for part of the survival bias and improves estimate accuracy. These findings are robust across different bandwidths, kernels, quadratic fits, and methods for extracting health outcomes. Additional sanity checks, including placebo outcomes, further confirm that the results are not driven by random fluctuations or the data structure.

Ind-1178 The Intended and Unintended Consequences of National Volume-based Procurement of High-value Medical Consumables in China

PRESENTER: **Yiru Wang**

Rising healthcare expenditures remain a critical concern in China. Since 2009, the Chinese government has implemented various healthcare reforms, including social health insurance and zero mark-up of drugs and consumables, to control costs and improve access to care (Meng et al., 2019). However, challenges persist, particularly due to the escalating costs of high-value medical consumables driven by an aging population, the increasing prevalence of chronic diseases, and profit incentives among healthcare providers (Yi, et al., 2014; Fu et al., 2018; Liu et al., 2019). To address these challenges, the Chinese government launched a national volume-based procurement (NVBP) policy for high-value medical consumables, starting with coronary stents in January 2021. This study evaluates the impact of the NVBP policy for coronary stents on healthcare expenditures, intensity of care, treatment outcomes, and service volume. Using inpatient records of all percutaneous coronary intervention (PCI) patients from a large pilot city between 2020 and 2021, we employ a time regression discontinuity (time RD) design. The results indicate that the NVBP policy reduced average total expenditures for PCI patients by 35.2%, driven primarily by a 65.4% reduction in costs for medical supplies and consumables, with no significant effects on other expenditure categories. Regarding intensity of care, while the length of inpatient stays remained unchanged, the number of coronary stents implanted increased. For the treatment outcomes, it showed no significant effect on 30-day readmission rates, though a slightly positive association was observed with in-hospital mortality. Weekly PCI service volumes increased by 43.3%, indicating improved accessibility. These results are robust to a variety of robustness checks. Heterogeneous analysis reveals that the expenditure-reducing effects were smaller among older, female, and less-severe (with smaller number of ICD codes) patient groups, potentially due to significant increases in stent usage in these populations. An event study model further shows that reductions in healthcare expenditures persist over time, while effects on care intensity diminish within a few months. Our findings suggest that the NVBP is an effective policy to reduce healthcare expenditures, especially compared with other policies with the same purposes (such as the zero markup of drug price) (Fu, et al., 2018). However, the observed increase in stent utilization raises questions about potential overuse, warranting further investigation. These results underscore the importance of policy designs that balance cost reduction with clinical appropriateness and quality of care.

Ind-1292 Potentially Preventable Hospitalizations for Non-communicable Diseases in China: Recent Trends and Macro- and Micro-level Determinants

PRESENTER: **Peipei Chai**
AUTHORS: Hao Wang, Yohannes Kinfu, Tiemin Zhai, Ran Xin

Objective Hospital care represents the largest component of healthcare expenditures in China. Consequently, reducing potentially preventable hospitalizations (PPHs) has become a priority for policymakers to improve health system performance. Although PPHs have been widely studied in developed nations, research in low- and middle-income countries, including China, is limited. This study aims to examine the incidence, associated costs, and potential determinants of PPHs related to non-communicable diseases (NCDs) within the Chinese context. **Methods** The incidence and associated costs of PPHs for six NCDs—angina, asthma, chronic obstructive pulmonary disease (COPD), congestive heart failure, diabetes mellitus (DM), and hypertension—were estimated by analyzing national administrative data from 2004 to 2021 in China. Changes at the aggregate or macro level were analyzed using Das Gupta's decomposition method, separating effects attributable to population growth, aging, disease prevalence, per-case utilization, medical price inflation and unit cost. To explore potential factors influencing PPHs at the individual level, a two-stage selection model was applied to the latest available wave of the National Health Service Survey in China, conducted in 2018. **Findings** In 2021, the total number of PPHs reached 19.5 million admissions, representing 9.69% of all hospital admissions—a five-fold increase since 2004. Expenditure on PPHs rose even more dramatically, escalating from 21.70 billion Chinese Yuan (CNY) in 2004 to 190.75 billion CNY in 2021 (adjusted to 2021 price levels), reflecting an annual growth rate of 13.64%. Decomposition analyses revealed that about 70% of the increase in PPHs from 2004 to 2021 was due to higher inpatient-care utilization, adding approximately 1.13 million admissions. Population growth and ageing contributed an additional 5.19% and 15.44%, respectively, while changes in disease prevalence rates accounted for the remaining 9.98%. The relative contributions of each factor varied by conditions. For example, changes in disease prevalence accounted for 47.56% of the observed changes in admissions for hypertension, while it contributed -6.04% to the changes for COPD. Regarding inpatient expenditure, more than half (51.73%) of the changes between 2004 and 2021 were due to increased utilization rates, followed by medical price inflation (16.26%) and the aging effect (12.48%). In contrast, the contributions from high unit costs, disease prevalence, and population growth were relatively minor, at 9.41%, 6.37%, and 3.75%, respectively. At the individual level, the incidence of PPHs was positively and significantly correlated with factors such as age, per capita consumption expenditure, and local hospital bed density. Conversely, it was negatively associated with educational attainment, self-reported health status, local physician density, and the time required to reach the nearest health facility from home. **Conclusions** The incidence of PPHs in China is high and has been sharply increasing, leading to a significant waste of medical resources. Interventions at the health system level, such as optimizing the allocation of health resources between human capital (e.g., health workforce density) and infrastructure (i.e., hospital bed availability), alongside improvements in individual-level sociodemographic factors, such as education, should be prioritized to address the escalating burden and financial impact of NCDs in China.

Ind-1964 Estimating the Economic Impact of the UK Infected Blood Scandal: Report of the Health Economics Expert Group to the UK Infected Blood Inquiry

PRESENTER: **Laura Downey**
AUTHORS: Prof. Katharina Hauck, PhD, Timothy Hallett, paul mccrone

Context: The UK infected Blood Inquiry was set up to investigate how tens of thousands of individuals came to be infected by HIV, Hepatitis, and other blood-borne infections through the National Health Service (NHS) in the 1970's and 1980's. The paper reports on the report of the Health Economics Expert Group (2023) who were tasked to estimate the economic and health costs of infected blood and blood products (IBBPs) to the United Kingdom between 1970 and 2021.

Methods: We undertook a comprehensive mixed-methods approach utilising both qualitative and quantitative methods. Thematic analysis of 63 witness statements was undertaken to document the wide-ranging economic, social and health impacts of infections by mode of transmission of infection. We employed a cost-of-illness model to quantitatively estimate the aggregate economic impact of infected blood and blood products to UK society of infection of the cohorts of persons infected with hepatitis C (HCV) and human immunodeficiency virus (HIV) by the NHS.

Results: The qualitative analysis identified the multiple impacts and sources of suffering associated with treatment with infected blood and blood products, including physical and mental impacts and severe side effects of treatments, impacts on employment, financial difficulties, and stigma. These impacts were particularly severe due to relatively low success rates of treatments, limited financial assistance, and the high prevalence of stigma in the population. The sum of healthcare and productivity costs ranges between £1.8 billion to £4.1 billion for the time period 1970 – 2021, when converted to 2021 values. This is comprised of health and social care costs ranging between £900 million and £1.6 billion, and productivity costs ranging between £900 million and £2.5 billion. The total loss in healthy life years due to ill-health and early deaths ranges between 70,000 and 190,000 QALYs. Around 60,000 – 100,000 QALYs were estimated to be lost to premature deaths and 10,000 – 90,000 QALYs to ill health during the lifetime of the infected persons. The total valued health losses ranged between £2bn and £5.8bn (for a £30,000 valuation of a QALY), and £4.1bn and £11.6bn (for £60,000 valuation of a QALY). The average healthcare and productivity costs per infected person range between about £45,000 and £193,000 over the period 1970 – 2021. Lost QALYs ranged between 1.8 and 9.3 per infected person, that is between £53,000 – £279,000 (for a £30,000 valuation) and £107,000 – £559,000 (for a £60,000 valuation) per infected person.

Summary: The infected blood scandal caused substantial economic and social impact to the UK population that are likely to be grossly underestimated in this analysis. The quantitative cost estimates were highly uncertain due to the considerable limitations on available data, and many assumptions and model simplifications that were required. This report is one of many sources of evidence requested by the Chair of the Inquiry to inform our understand of the impact of infected blood on the British public and how we can prevent a scandal of this nature and magnitude in future.

Ind-1783 Does National Health Insurance Prioritize Health Service Equity? a Retrospective Analysis Based on the Heart Disease Claim in Referral Healthcare

PRESENTER: **Muhamad Faozi Kurniawan**
AUTHORS: Laksono Trisnantoro, Ardhina Nugrahaeni

Background. Universal health coverage (UHC) ensures that all individuals can access a comprehensive range of quality health services as needed without experiencing financial hardship. The National Health Insurance (JKN) in Indonesia ensures equitable access to excellent health services for all levels of society. Since 2014, JKN has strived to provide financial protection to all segments of society, particularly marginalized and disadvantaged populations, within a universal health insurance framework. However, there exists a lack of equity in the provision of health services. Cardiovascular disease is an example of an inequitable benefit package that leads to higher hospital claims compared to other diseases, primarily due to the limited availability of hospitals, the uneven distribution of health workers, and other disparities between different regions in Indonesia. This study endeavors to pinpoint the discrepancies in benefit package utilization across various regions in Indonesia, attributable to unequal access and restricted health resources.

Method. We used secondary data analysis from the Social Security Agency (BPJS) Health for the years 2015 to 2022 as our methodology. This BPJS sample data accounts for 1% of the total JKN membership. STATA software processes the data, grouping variables into regional categories for specific areas, segments for different types of JKN membership, and the number of hospital claims for each regional. Excel graphs and tableau applications visualize the STATA-processed results in the form of Excel tables.

Result. Region 1 in Indonesia boasts the highest health resources compared to other regions, particularly regions 4 and 5. JKN participants visited the hospital from 25.5 million in 2014 to 276.6 million in 2023. This condition also shows that the number of hospital claims increased from 30.44 trillion rupees in 2014 to 138.36 trillion rupees. However, if we look at the number of claims per region, the total hospital claims between regions show a large disparity. In 2022, the number of hospital claims in region 1 was 28 times higher than region 5, or 3.49% of the number of claims in region 1. The highest heart disease claims were in Region 1, and the participant segments that used them the most were the independent participants and the worker sector.

Conclusion. The study concluded that although JKN has made substantial progress in improving equity in access to health care, the limited number of hospitals and adequate resources to meet service needs such as heart disease in regions 4 and 5 has reduced the equity in health services for certain diseases.

Keywords: equity, health service, JKN

11:00 AM –12:30 PM WEDNESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Singaraja

Costs, Costing and Resource Allocation

MODERATOR: **Zanfina Ademi**, Monash University

Ind-2622 Optimizing Healthcare: The Importance of Understanding Primary Healthcare Facility Running Costs in Nigeria

PRESENTER: **Nkoli Pamela Uguru**, University of Nigeria
AUTHORS: Chinyere Okeke, Obinna Onwujekwe

Introduction

Nigeria's primary healthcare system struggles with funding shortages, resulting in high user fees and decreased public trust, pushing people to more expensive options. The government created the Basic Health Care Provision Fund to address this, but key challenges include determining necessary funding and understanding costs for better management and efficiency.

Method

The study investigated primary health care (PHC) facilities in Nigeria's six geopolitical zones between June and July 2024. It employed mixed methods, including a desk review and data collection from 24 PHCs across six states: Kano, Lagos, Adamawa, Nasarawa, Rivers, and Enugu. Using a multistage sampling method, two local government areas per state were selected to represent urban and rural contexts, with two public PHCs chosen in each LGA based on their activity levels. The research assessed the operational and comprehensive expenditures of these facilities using a full costing approach to calculate monthly, bi-annual and annual expenses in Naira, considering the inflation rate. Descriptive statistics, especially the mean, were applied to analyze costs, enabling comparisons among different states and types of facilities.

Results

The operational expenditure analysis of primary healthcare centers (PHCs) in Nigeria shows significant cost differences based on location (urban vs. rural) and activity level (busy vs. not busy). Generally, urban busy (UB) PHCs incur higher costs, except for Lagos and Nasarawa States, where rural busy (RB) PHCs have greater expenses due to increased logistics and utilization demands. Busy PHCs experience higher costs due to greater patient turnover and staffing needs, highlighting the importance of prioritizing rural busy facilities, which face funding gaps despite high patient inflows. Lagos and Rivers States have the highest expenditures, with the RB PHC in Lagos costing approximately ₦13.2

million and the UB PHC in Rivers State costing around ₦13.6 million annually. Personnel costs are a significant driver of these expenses, as indicated by the steep rise from ₦4.1 million for RB PHCs to over ₦13.2 million for comprehensive expenses. Operating a PHC costs about ₦18.7 million annually or ₦1.6 million monthly, with urban and busy PHCs incurring even higher monthly expenses.

Conclusion

Expenditure levels in Nigeria's healthcare system vary by geopolitical zone and facility type. More utilized primary health centers (PHCs) face higher operational and staffing costs due to increased demand and logistical requirements. The study provides insights into the spending trends of health facilities, detailing costs, revenue, and funding shortfalls. The findings aim to guide future funding allocations to strengthen the PHC network, improve healthcare access, reduce patient financial burdens, and enhance the overall efficiency of the health system.

Ind-2822 Resource Gap Analysis Using Normative and Actual Costs: A Tool for Efficient Resource Allocation

PRESENTER: **Tushar Mokashi**
AUTHORS: Rajeev Prasad, Arun Nair, Maulik Chokshi

Introduction The growing demand for primary healthcare (PHC) in India, combined with limited public resources, highlights the importance of efficient resource allocation. With the Government of India enhancing PHC through the Comprehensive Primary Healthcare Package (CPHC) under Ayushman Bharat's Health and Wellness Centers (AB-HWCs), understanding the cost of PHC delivery and identifying financing needs becomes essential. This study focuses on analyzing PHC network costs in Tamil Nadu, estimating both actual and normative costs of PHC services, and identifying resource needs to guide effective decision-making in resource allocation. **Methodology** The study adopts a public-sector perspective to assess facility-level recurrent costs for PHC services during April 2019 to March 2020. The methodology involved two key components: 1. Actual Costs: Data was retrospectively collected from 25 sampled health facilities in Tamil Nadu, focusing on key recurrent expenses. 1. Normative Costs: These were derived from Standard Treatment Protocols (STPs) developed by clinicians, population in need (PIN), and associated costs. The normative costs reflect the resources required for quality PHC delivery. The comparison of actual costs with normative benchmarks allowed the identification of resource needs at each facility level, providing insights into the extent of financing gaps. **Results** The findings highlight the following: - The direct network cost per capita was INR 398.3 (USD 5.6). - The normative CPHC cost per capita was estimated at INR 1,211.5 (USD 17.1). - This revealed a 67% resource gap, assuming 100% rural population coverage by the public sector. Recognizing varying care-seeking behaviors, the study also considered different coverage levels to better reflect actual utilization. These findings demonstrate financing shortfalls and a need for alignment between resource allocation and service utilization. **Conclusion** This study provides critical insights into the costs of delivering PHC and the associated financing needs in Tamil Nadu. By identifying the resource gaps and presenting normative benchmarks, it offers policymakers evidence to optimize resource allocation, address health burdens, and plan for equitable healthcare delivery. The findings emphasize the importance of strategic investments in PHC, development of electronic health data systems, and refinement of STPs for standardized care. These contributions aim to strengthen India's PHC system, ensuring accessible, high-quality healthcare for all.

Ind-1925 Long-term Costs of Healthcare Among Survivors of Infant Group B Streptococcus disease in Denmark

PRESENTER: **Simon Procter**, London School of Hygiene and Tropical Medicine
AUTHORS: Erzsébet Horváth-Puhó, Henrik Toft Sørensen, Bronner Gonçalves, Malene Risager Lykke, Joy Lawn, Proma Paul

Group B Streptococcus (GBS) is a leading cause of neonatal invasive bacterial disease worldwide. Invasive GBS (iGBS) disease in neonates and young infants can lead to sepsis and meningitis, and survivors are at risk of long-term neurological sequelae, with an estimated 37,000 surviving infants globally developing long-term moderate or severe neurodevelopmental impairments (NDI) each year. However, there is little quantitative evidence available on the healthcare costs associated with iGBS beyond infancy. In this study we aimed to estimate the long-term healthcare costs in a population-based cohort including children with history of iGBS disease in Denmark.

Exposed children with history of iGBS disease (sepsis, meningitis or pneumonia) within the first 89 days of life were identified using the Danish National Patient Registry (DNPR) based on discharge diagnosis classified using International Classification of Diseases (ICD)-10 codes. For each exposed child, ten unexposed children were randomly selected and matched by sex, year, and month of birth. Participants were included in the analysis for the period from Jan 2007, until Dec 2017. Overall, we included 670 iGBS exposed individuals and 6720 matched unexposed individuals.

Participants were included in the analysis for the period from Jan 1, 2007, until 31st Dec 2017. Information on whether children in either group developed NDIs was obtained from the DNPR using ICD-10 codes for mental, behavioural, and nervous system disorders. We assessed NDI based on any NDI diagnosis at 5 years of follow-up from the index date.

Cost data was obtained by linking individuals records from the DNPR to the following national registers: primary care reimbursement (primary care costs, including general practitioner care, diagnostic costs, dentistry, and other ancillary care), pharmaceutical (community-dispensed prescriptions, including both the out-of-pocket co-payment and the government subsidy) and hospital (combining all in- and out-patient visits). Longitudinal data was used to estimate annual costs according to the time from the year of diagnosis (from birth and up to 10 years of follow-up). Mean costs in each category were estimated from a health system perspective for iGBS and comparison groups, and all costs were inflated in Danish Crowns (DKK) using the consumer price index and converted to 2017 Euro.

We will present a descriptive analysis comparing annual costs by category and year of follow-up, and additionally present a stratified analysis showing how costs in the exposed and unexposed groups are influenced by prematurity and by the presence of NDI diagnosis. We will also conduct a statistical analysis using Generalised Linear Models to assess the association between iGBS disease and different cost categories.

Our analysis will add to the very limited literature on the costs of GBS infections in young children, and notably will include longer follow-up

later into childhood than previous studies allowing us to investigate the costs of long-term sequelae caused by GBS. These findings will also be informative for economic evaluations of interventions to prevent GBS including maternal vaccines that are anticipated to become available in the next few years.

Ind-1433 Epilepsy Projections in Australia 2024-2033: A Dynamic Lifetable Model of Population, QALYs, PALYs, and Healthcare Costs

PRESENTER: **Gopisankar Mohanannair Geethadevi**
AUTHORS: Graeme Jackson, For the Australian Epilepsy Project Investigators, Kristoffer Jarlov Jensen, Zanfina Ademi, Patrick Kwan, Emma Foster, Zhibin Chen

Objectives: This study aimed to project years of life (YL), quality-adjusted life years (QALYs), productivity-adjusted life years (PALYs), and healthcare costs associated with epilepsy in Australian adults aged 18 to 80 years from 2024 to 2033.

Methods: A dynamic model was created to capture both incident and prevalent cases of epilepsy in Australia using five health states: Not Seizure-Free Non-Drug Resistant (NSF-NDRE), Seizure-Free Non-Drug Resistant (SF-NDRE), Not Seizure-Free Drug Resistant (NSF-DRE), Seizure-Free Drug-Resistant (SF-DRE), and death. The model cycled annually and incorporated data from the largest cohort study of epilepsy patients (n = 1,795) conducted in Glasgow between 1982 and 2014, as well as data from the Australian Epilepsy Project (AEP), an ongoing cohort study with 485 participants that evaluates the use of advanced MRI, neuropsychological assessments, and genetic testing. Population dynamics over time were modelled using estimates from the Australian Bureau of Statistics. YL was calculated by summing up individuals in each health state by year, age, and sex. QALY estimations were derived from EQ-5D-5L utility values for each health state, multiplied by YL. PALY estimates were based on the average annual working days and sick leave attributed to epilepsy, comparing the data for each health state against the general population. Discounting values of 5% were applied to costs and outcomes as per Australian guidelines.

Results: By 2033, there were 82,723 new cases of epilepsy, including 42,127 (50.9%) females and 40,594 (49.1%) males. In 2024, the total prevalent cohort numbered 125,223, comprising 65,911 (47.4%) females and 59,311 (52.6%) males. Across the 10-year period, the population accrued 1,209,280 years of life, distributed as follows: 23.6% NSF-NDRE, 58.3% SF-NDRE, 15.8% NSF-DRE, and 2.1% SF-DRE. The total healthcare cost reached $19.8 billion AUD, with the highest contributions from NSF-DRE ($6.7 billion; 34%) and NSF-NDRE ($5.6 billion; 28.6%). The total accrued QALYs and PALYs were 990,387 and 434,660, respectively. The number of epilepsy-related deaths was 15,227. In 2024, 10,665 individuals with focal DRE were eligible for surgical evaluation, with an additional 383 projected annually through 2033.

Conclusions: This comprehensive forecast of epilepsy in Australia highlights that patients with DRE will disproportionately drive healthcare costs over the next decade. Expanding epilepsy care programs is essential to reduce the burden of DRE. This dynamic model, which accounts for the natural progression of epilepsy, aims to inform decisions on interventions that can reduce healthcare and productivity burdens while enhancing the quality of life for individuals with epilepsy.

Ind-246 Predictions for Dementia Prevalence and Socioeconomic Costs in China by 2050: A Markov Modelling Study

PRESENTER: **Jing Liao**
AUTHORS: Yixuan Liu, Ruini Sun, Piotr Bandosz, Yuntao Chen, Eric French, Eric J Brunner, Sophia Lobanov-Rostovsky, Yanjuan Wu, Yuyang Liu

Background: Accurate forecast of future dementia burden is essential is important for preventive strategy for fast-ageing China. Yet it remains unclear how temporal trends in dementia incidence and shifting demographics will shape China’s future dementia burden. Understanding primary drivers of future dementia burden is crucial for identifying areas where policy interventions could yield future savings. Aim: This study aims to project the future dementia prevalence, socioeconomic costs (healthcare, formal social care, and informal care costs) and value of quality adjusted life years (QALYs) lost to dementia, and to assess drivers of dementia burden in China by 2050. Methods: Using data from two national representative Chinese aging cohorts (CHARLS, CLHLS), we applied a ten-state Markov model (IMPACT-CAM) to project the dementia burden among individuals aged 50+ by 2050, factoring in population trends in dementia incidence, mortality, and dementia-related comorbidities. Three scenarios for future dementia incidence were simulated: increasing (+2.9%), stable (0%), or decreasing (-1.0%). We estimated its future socioeconomic costs and calculated QALYs lost corresponding to the three incidence trend scenarios. To identify main drivers, the projected dementia burden was further decomposed into population growth, population ageing, changing dementia prevalence and average socioeconomic cost per dementia case. Results: In the scenario with increasing dementia incidence, an estimated 66.3 million people could have dementia by 2050, representing 10.4% of the population aged 50+, with associated annual socioeconomic costs reaching $1,233 billion and $702 billion in QALYs lost. If dementia incidence remains stable or decreases, the number of dementia cases would be significantly lower to 43.9 million or 37.5 million respectively, with socioeconomic costs reduced by 34% or 43% compared to an increasing incidence trend. Informal care constitutes the largest portion of socioeconomic costs, a trend expected to continue. Population aging and increasing dementia prevalence are identified as the primary drivers of rising dementia burden through 2050. Conclusion: Our findings underscore a looming increase in dementia burden in China over the coming decades if incidence rates continue to climb. The socioeconomic costs and QALYs lost to dementia are projected to rise steeply, with informal care costs making up the largest proportion. Public health strategies focused on dementia prevention could play a critical role in mitigating this growing disease burden. As population aging and dementia prevalence are the primary cost drivers, public health efforts aimed at dementia prevention and promoting healthy aging are essential.

Bali International Convention Centre – Lotus

Maternal and Child Health, and Gender Issues

MODERATOR: **Mario Martinez-Jimenez**, Imperial Business School

Ind-153 Mind the Gap: The effect of Gender Wage Gap on Mental Health

PRESENTER: **Seetha Menon**

AUTHOR: Miriam Jensen

Background: Depressive and anxiety disorders are twice as common among women than men. Research shows women with lower income than matched male counterparts report higher depression and anxiety rates and perceived workplace gender discrimination has been shown to negatively impact women's mental health but not men's. **Research Question:** While previous studies have highlighted the influence of workplace dynamics on mental health, many rely on self-reported data, which are prone to biases such as social desirability, non-response, miss-classification, and under-reporting. To address these limitations, we leverage objective administrative data on healthcare utilization. We hypothesize that actual or perceived structural gender inequality in the workplace partially explains the gender disparity in mental health outcomes. **Methodology:** Using matched employer-employee data, we calculate an individual specific gender wage gap (GWG) and examine its effect on visits to psychologists and psychiatrists, and associated insurance costs for all full-time employees in Denmark between 2008-2018. Estimating this effect is challenging due to two reasons. Firstly, unobserved factors such as personality, productivity, gender identity or parenthood can influence both wages and mental health. Thus GWG may not reflect structural gender inequality but could instead reflect underlying differences of male versus female employees. Second there may be reverse causality in that adverse mental health may affect productivity and lead to lower wages at the individual level. To address these challenges, we develop a measure of benchmark GWG (BGWG) using the Bartik approach, inspired by recent economics literature such that BGWG in industry, occupation, year, and firm is the average of the GWG in the same industry, occupation, and year across all firms excluding the firm the index individual is employed in. BGWG thus captures potential GWG (as opposed to realized GWG) that an individual is exposed to. **Key Results:** Both GWG and BGWG significantly increases women's visits to mental health professionals, with no similar effect for men. The effect of BGWG on mental health visits suggest that broader structural inequalities contribute to women's adverse mental health. Next we plan to extend this analysis by examining drugs prescribed for anxiety and depression as an additional outcome. We hypothesize that this effect is more pronounced among women who are more acutely aware of wage differentials. To test whether the effect size is greater for these women, we will use union membership as a proxy for awareness of GWG. Additionally, we will extend the data to take advantage of a 2006 legislative change in Denmark that required firms to report gender-disaggregated wage statistics. We will use this law as an exogenous shock to the gender wage gap (GWG) to validate our main findings. **Implications:** Given the costs of poor mental health—such as healthcare expenses, reduced productivity, and unemployment—there is a strong case for policy interventions to reduce wage inequality. This study contributes to literature by focusing on a Scandinavian context, showing that even relatively equitable societies like Denmark face mental health consequences from wage disparities.

Ind-1651 Gender Differences in Time Preferences Across Health and Financial Domains: Do Elicitation Approaches Matter?

PRESENTER: **Danlei Chen**, Xi'an Jiaotong University

AUTHORS: Cong Li, Jingxian Wu

Background: Time preference, which reflects individuals' propensity to prioritize immediate benefits over future gains, play a significant role in decision-making across domains such as health and finance. Gender differences in time preferences have been proposed as a potential explanation for behavioral variations between males and females. However, empirical findings on the existence of gender differences in time preference remain inconclusive, as most studies rely on a singular method to measure time preferences. Considering the diverse methods available for elicitation time preferences, this study aims to address these inconsistencies by examining how different elicitation approach influence gender differences in time preferences. **Methods:** Data were collected through a pencil-and-paper household survey conducted in six counties of Shaanxi province, China, using multistage stratified random sampling. The sample comprised 2,878 individuals aged 18 to 65 from 1,377 households. Time preferences were assessed in both health and financial domains using self-reported and incentivized experimental methods. Self-reported methods involved standardized scales for respondents to measure their degree of time discounting, while incentivized experiments presented participants with choices between immediate and delayed gains or losses. Time preference indicators were standardized with means of 0 and standard deviations of 1 to ensure comparability across different elicitation methods. Stepwise ordinary least squares (OLS) regression analyses were conducted to examine the correlations between gender and time preference, controlling for individuals' demographic, socioeconomic, and health-related characteristics as well as the county fixed effect. **Results:** In the health domain, incentivized experimental methods with health-related outcomes revealed no significant gender differences in time preferences, both before (crude coefficient = 0.029, *p* = 0.431) and after (adjusted coefficient = 0.033, *p* = 0.381) controlling for covariates. In contrast, self-reported time preference indicators showed that females exhibited significantly greater patience than males, both without (crude coefficient = 0.168, *p* < 0.001) and with control variables (adjusted coefficient = 0.156, *p* < 0.001). Similar patterns were observed in the financial domain: incentivized experimental methods with monetary outcomes showed no significant gender differences, while self-reported indicators revealed greater patience among females, both before (crude coefficient = 0.125, *p* < 0.001) and after (adjusted coefficient = 0.139, *p* < 0.001) controlling for covariates. **Conclusion:** Gender differences in time preferences are significantly influence by the elicitation methods used. Females consistently exhibit more patient time preferences in self-reported methods across both health and financial domains, while incentivized experimental methods fail to reveal such differences. These findings suggest that the observed gender differences may reflect self-perceptions rather than actual decision-making behaviors, highlighting the importance of considering elicitation approaches when interpreting time preference data. Future research should explore the cognitive and contextual factors underlying these gender differences and their

implications for health and financial decision-making. (This study is funded by the National Natural Science Foundation of China (No. 72104196))

Ind-810 Effect of Pre-exposure Prophylaxis on Risky Sexual Behaviour of Female Sex Workers in Dakar, Senegal: A Randomised Controlled Trial

PRESENTER: **Aurelia Lepine**, University College London
AUTHORS: Wally Toh, Abdou Khoudia Diop, El Hadji Alioune Mbaye, Owen O'donnell, Khady Gueye, Mame Mor Fall, Cheikh Tidiane Ndour

Background HIV prevention through pre-exposure prophylaxis (PrEP) may encourage riskier sexual behaviours that undermine the protection afforded by PrEP and generates negative spillovers on sexually transmitted diseases. Tests for such risk compensatory behaviour in high-risk populations, such as for female sex workers (FSW), are lacking.

Methods We stratified a sample of 500 female sex workers in Dakar, Senegal by self-reported sexual risk-taking and prior PrEP experience and randomly assigned them to PrEP referral in October 2021-January 2022 (treatment, n=300) or to deferred PrEP referral after the endline survey in April-May 2022 (control, n=200). We randomised 500 FSWs to start PrEP and included 308 FSWs in the final analysis (T=182, C=126). We compared outcomes in the period preceding PrEP referral of the control group. The primary outcome was self-reported condom use with clients. Secondary outcomes were self-reported sexual risk taking, number of clients, proportion of regular clients, perceived HIV risk of clients, and type of sex act. We estimated intention-to-treat effects of PrEP referral and both average treatment effects on the treated and local average treatment effects of PrEP utilisation. The trial is registered with ISRCTN (ISRCTN16445862).

Findings PrEP referral increased the probability of using PrEP by 34.5 percentage points (pp) [95% CI: 25.4, 43.6; p<0.0001, control group mean: 11.1%]. Estimated effects of PrEP referral and PrEP use on condom use with the last client were 3.3 pp [95% CI: -4.0, 10.6; p=0.376] and 7.9 pp [95% CI: -10.4, 26.3; p=0.397 respectively (control group mean: 84.9%). When looking at condom use with all last three clients, these effects were 11.0 pp [95% CI: 0.8, 21.1; p=0.034] and 25.8 [95% CI: 5.2, 46.4] respectively (control group mean: 67.5%) There were no notable effects on other risky sexual behaviours.

Interpretation This randomised experiment did not give strong grounds for concerns that PrEP encouraged sexual risk-taking by FSWs, at least in the short-term. Robustness of this finding should be tested in larger, longer-term studies and in other contexts. Whether PrEP users are more likely to overreport condom use than non-PrEP users should also be further investigated.

Ind-1930 Preferential Treatment in Health and Well-Being: Measuring Pluralistic Ignorance Around Son Preference in Urban India

PRESENTER: **Vasanthi Subramonia Pillai**, Technical University of Munich
AUTHOR: Henrike Sternberg

Background and Research Question: Gender discrimination remains a prevalent issue in India and worldwide. Its manifestation in the form of preferential treatment of sons versus daughters before birth (e.g., sex-selective abortion) and after birth (e.g., unequal healthcare/educational investments) threatens gender equality and economic efficiency. While strong gender norms have been identified as one of the most important drivers of parental son preference, they are often misperceived by the population. For instance, Indian citizens drastically underestimate public support for affirmative action policies. Such misperceptions may also exist for gender norms about son preference, resulting in a state of pluralistic ignorance: A situation where the majority of individuals in a group privately oppose a certain norm, but because they wrongly believe that all other group members support it, they end up acting in conformity with the norm rather than with their own conviction. We identify two important gaps in the current literature: First, to the best of our knowledge, there is limited evidence of a comprehensive measurement of son preference in daily decision-making in terms of children's health and well-being. Second, no study has examined pluralistic ignorance around son preference, which may be a key driving force resulting in preferential treatment of sons vs. daughters. This study aims to investigate the existence of misperceived norms in the context of son preference in India and its relationship with preferential treatment by parents in various dimensions of daily life, including health and nutrition.

Methods: We conducted a cross-sectional study with embedded randomized experiments among 300 households in Chennai, India. Interviews were conducted both with the wife and the husband, separately (total observations: 600) The study administered a quantitative household survey to measure (1) wives' and husbands' own attitudes toward son preference, (2) their perception of their community's and their spouse's attitudes toward son preference, and (3) actual and hypothetical gender-preferential treatment by parents across various dimensions of daily life. We introduce a novel "twin game" to estimate the extent to which husbands and wives exhibit tendencies of preferential treatment. In addition, we also collected insights to potentially inform the design of a future intervention to reduce son preference.

Results: A first-cut analysis reveals evidence of pluralistic ignorance in several dimensions of son preference, including health outcomes. Specifically, both women and men in our sample significantly underestimate, especially men's support of equal treatment of sons and daughters. For instance, in terms of prioritizing the son over the daughter regarding health and educational investments, actual support of this preferential behavior is much lower (around 30 percentage points) than the support perceived by survey participants when asked about their community. We aim to complete our analysis by January 2025.

Conclusions and policy implications: The (preliminary) findings from our study suggest that pluralistic ignorance also exists in the context of son preference. Thus, simple and scalable interventions providing information about norm perceptions show the potential to be highly effective.

Ind-2513 The Mediation of IADL Limitations on Chronic Pain Affecting Depressive Symptoms and Its Gender Differences in Middle-aged and Older Chinese

PRESENTER: **Xinpeng Xu**
AUTHORS: Qifeng Wu, Hua You, Kangkang Zhang

Abstract

Background: Chronic pain is more prevalent in middle- and low-income countries and associated with depressive symptoms. Most studies have examined the biological and psycho-behavioral mechanisms by which chronic pain affects depressive symptoms while neglecting the exploration of the social mechanisms involved in this relationship. The ability to perform instrumental activities of daily living (IADL) is essential for maintaining social networks and engagement in society but studies have not validated its mediating role. Additionally, previous evidence suggests that there may be gender differences in the relationship between chronic pain, IADL limitations, and depressive symptoms. This study aims to investigate the longitudinal mediating role of IADL limitations in the impact of chronic pain on depressive symptoms and its gender differences among Chinese middle-aged and older adults.

Methods: We obtained data from 2011 (Time 1, T1), 2015 (Time 2, T2), and 2018 (Time 3, T3) waves of the China Health and Retirement Longitudinal Study, involving 17,302 middle-aged and older adults aged 45 years or above. Chronic pain situation was assessed by calculating the total number of sites where chronic pain occurred, IADL limitations were derived from the participants' reports of difficulties in IADL, and depressive symptoms were measured using the ten-item short form of the Center for Epidemiologic Studies Depression Scale. Finally, we constructed comprehensive longitudinal mediation models utilizing the cross-lagged panel model, with covariates including age, gender (not for gender comparison), residence, marital status, education attainment, income, working status, body mass index, disability, walking aids use, smoking, drinking, and chronic conditions.

Results: We observed a significant positive total effect of T1 chronic pain on T3 depressive symptoms (β = .051, $P < .001$), which was partially mediated by T2 IADL limitations (β = .006, $P < .001$, 95% CI .003–.010, 11.76% of the total). Specifically, T1 chronic pain predicted T2 IADL limitations (β = .058, $P < .001$), which subsequently was predictive of T3 depressive symptoms (β = .108, $P < .001$). The results revealed gender differences, with the longitudinal mediation effect of IADL limitations being significant for females (β = .008, $P = .01$, 95% CI .003–.015, 18.18% of the total effect) and of no significance for males (β = .003, $P = .09$).

Conclusions: This study supports that IADL limitations mediate the pathway from chronic pain to depressive symptoms among middle-aged and older Chinese, but the mediating role may not apply to males. The tentative proposal is to tailor and prioritize public health initiatives targeted at the protection of IADL functioning for females with chronic pain. Subsequent investigations could further substantiate these findings and implications by incorporating a broader range of confounders, exploring potential interactions, and enhancing model performance.

Keywords chronic pain; depressive symptoms; IADL limitations; longitudinal mediation; gender differences

Ind-2718 The Role of Gender in Early Childcare Practices in Low- and Middle-Income Countries: a Systematic Review and Meta-Analysis[JM1]

PRESENTER: **Manzura Jumaniyazova**
AUTHORS: Friederike Suhr, Eliana Chavarría Pino, Janina Steinert, Cecilia Michelle Argueta

***Summary**:*

Background: Gender disparities in early childcare not only disadvantage girls in early childhood but also reinforce societal structures that impede gender equality, creating long-lasting barriers to their well-being and future opportunities. Existing reviews focus on a limited number of countries and specific outcomes, often relying solely on narrative syntheses.

Methods: This systematic review and meta-analysis aim to quantitatively synthesise evidence on the role of gender in early childcare practices in low- and middle-income countries (LMICs), focusing on breastfeeding, immunisation, pre-and post-natal check-ups, and healthcare expenditure of children under five using robust variance estimation technique. We conducted a comprehensive search across various scientific databases, repositories, and journals in November 2021 and re-run the searches in January-February 2024 with no publication type and date restrictions. We restricted our search to studies written in English and had a sample size of more than 30 children. The protocol of this study was registered at PROSPERO (CRD42021286151).

Findings: We identified 79 eligible studies covering 65 LMICs, with 50 studies included in the meta-analysis. The sample size of included studies ranged from 102 to over six million children, accounting for a total sample of nearly 16 children included in the meta-analysis. The pooled analysis reveals significant gender discrimination against girls across outcomes (Hedge's g = -0.081, 95% CI [-0.137, - 0.028], I2=98.8%). This discrimination is particularly pronounced in breastfeeding practices (Hedge's g = -0.05, 95% CI [-0.093, - 0.007], I2=96.08%) and immunisation (Hedge's g = -0.07, 95% CI [-0.131, - 0.011], I2= 99.22%). While significant differences are observed in pre- and post-natal check-ups (Hedge's g = -0.029, 95% CI [-0.058, 0.000], I2 =73.39%), the results are driven by a limited number of studies. We find no gender differences in healthcare spending patterns (Hedge's g = -0.276, 95% [-0.64, 0.87], I2=91.43%).

Interpretation: Our findings emphasise significant gender disparities in early childcare practices, particularly in India. Future studies should explore gender differences in access to and expenditure on healthcare services. Our results do not apply to high-income countries.

Keywords: Son preference, breastfeeding, immunisation, pre- and post-natal check-ups, healthcare expenditure, systematic review, meta-analysis, meta-regression

Ind-8 The Impact of Spousal Bereavement on Cognitive Function of Taiwanese Elderly Population

PRESENTER: **YA-MING LIU**, National Cheng Kung University
AUTHOR: Yi-Syuan Lai

OBJECTIVES: The impact of widowhood affects most individuals. Losing a spouse or partner, who serves as a pillar of support, can have significant repercussions on one's life, which even affect psychological well-being, physical health, and cognitive functioning. Previous studies in Taiwan have explored the impact of widowhood on various aspects of middle-aged and older adults, but most focused on the effects of widowhood on mental health and well-being. Few have examined the impact of widowhood on cognitive function. Therefore, this study aims to examine the impact of widowhood on cognitive functioning among middle-aged and elderly individuals in Taiwan by utilizing data from the "Taiwan Longitudinal Study on Aging (TLSA)" conducted in 2003, 2007, 2011, and 2015

METHODS: The study utilizes four waves of surveys conducted in 2003, 2007, 2011, and 2015, with a sample size of 5,377 people and a total of 16,634 data points for analysis. Focusing on middle-aged and elderly individuals aged 50 and above from TLSA, the Short Portable Mental Status Questionnaire (SPMSQ) is used to measure cognitive function. After widowhood status is matched to non-widowed individuals by propensity score matching, we employ the Difference-in-Differences (DID) method and fixed-effect models to investigate the effect of spousal bereavement on cognitive behavior. Control variables, such as demographic characteristics, ADL scores, cardiovascular disease, and stroke history, were included in the analysis to account for potential confounding factors.

RESULTS: We found that individuals who have experienced widowhood resulted in a more significant decline in cognitive function compared to those who have not experienced such a loss. Our results show that individuals with the following characteristics - female gender, living with fewer than five family members, educational level of high school or below, household with lower annual income - experience a significant decline in cognitive function after experiencing the loss of a spouse.

DISCUSSION: Our findings suggest there is a heterogeneity effect of spousal bereavement on cognitive function. Women may experience more economic hardship after becoming widowed, which can further affect their cognitive function. When living with fewer than five family members, the bereaved individual has fewer people to interact with at home, leading to a greater impact on their cognitive function. Those with lower household annual incomes experience a greater impact of widowhood, because they not only endure the pain and stress of losing a spouse but also face financial and life worries after widowhood. Individuals with higher levels of education tend to have greater adaptability, leading to better cognitive ability and psychological state after the impact of widowhood. For individuals with a history of cardiovascular disease and stroke, who inherently have a higher risk of cognitive impairment, their cognitive function likely declines after experiencing widowhood.

Ind-116 Nudging Vaccination Intentions: Who are More Affected by Information About Herpes Zoster Vaccines?

PRESENTER: **Yiqi Xia**
AUTHORS: Xin Ye, Zhenyu Shi, Dawei Zhu, Ping He

Background: Despite the availability of effective vaccines, vaccination rates remain suboptimal in many populations, highlighting the need for novel strategies to promote vaccine coverage. Nudges, which subtly influence decision-making by framing information, have been proved to increase Covid-19 and influenza vaccination intentions. However, evidence is limited on whether nudges are effective for vaccines with lower awareness, and who is more likely to be affected by nudging information. Herpes zoster (HZ) is a viral infection that can lead to severe pain and impair daily activities, particularly in older adults. With an aging population, the incidence of HZ is rising, creating a growing medical and economic burden globally.

Objective: This study aims to evaluate the effect of nudges on the intention to receive the HZ vaccine, with an emphasis on understanding how diverse subgroups respond to nudging information.

Methods: From July to September 2024, we conducted a randomized controlled experiment with 4370 participants aged over 40 in China Participants were randomly assigned to one control group or six treatment groups, each receiving a standard introduction to HZ. The treatment groups received additional nudging messages, including clinical evidence, clinical professional recommendations, low or high descriptive norms, and positive or negative framing. Demographic data, HZ awareness, health status, and subjective attitudes were collected, and HZ vaccination intentions were measured on a 1–10 scale. We compared each nudging effects against the control group, adjusting for baseline characteristics. Subgroup analyses were performed across gender, age, health status, as well as subjective attitude such as perceived well-being, self-perceived economic and social status.

Results: We found that nudges based on clinical evidence, descriptive norms and positive attribute framing significantly increased HZ vaccination intentions compared to the control group. These results remained robust after controlling for participants' awareness of HZ severity, susceptibility, and vaccine safety and efficacy. Subgroup analyses revealed substantial differences in how individuals responded to the nudges. Female and younger participants were more influenced by positive attribute framing, while male and older participants responded more to descriptive norms. Moreover, HZ vaccination intentions increased primarily among participants who had not been infected with HZ, had higher self-rated health status, and had no depressive symptoms. Additionally, individuals with higher perceived well-being, life satisfaction, confidence in the future, and higher self-perceived social status, as well as those with lower self-perceived economic status, were more responsive to the nudges.

Conclusions: This study is the first to demonstrate that informational nudges, specifically influence from clinical evidence, descriptive norms and positive attribute framing, can significantly enhance HZ vaccination intentions. The results also highlight important subgroup differences, suggesting that tailored messaging strategies may be necessary to optimize vaccine uptake across diverse populations. These findings underscore the potential of applying nudges to improve vaccination rates and provide actionable evidence to increase vaccine coverage.

abs-os218 E-Cigarette Taxation and Queer Youth

PRESENTER: **Mr. Joseph Sabia**
AUTHORS: Michigan State University Cotti, Erik Nesson, Charles Courtemanche, Anthony Chuo, J. Catherine Maclean

Background: Electronic nicotine delivery systems (ENDS) use among lesbian, gay, bisexual, and questioning (LGBQ) teenagers is over 30 percent higher than among their heterosexual counterparts. Yet little is known about how recent efforts to curb nicotine vaping through ENDS taxes impact sexual minorities. This study was the first to explore this question. **Aims of the Study:** The current study sought to explore whether ENDS tax differentially affected LGBQ-identifying teenagers and young adults as compared to heterosexual-identifying teenagers and young adults. The study also sought to explore whether other public policies that affected access to ENDS products exacerbated or narrowed disparities in ENDS use between sexual minorities and other youths. **Methods:** Data were available for n=434,665 heterosexual identifying youths and 91,823 LGBQ-identifying youths in the State and National Youth Risk Behavior Surveys. The independent variable was the ENDS tax per mL of e-liquid equivalent and the dependent variables included prior-month ENDS use, prior-month ENDS use on at least 20 of the last 30 days, and ENDS use everyday in the last 30 days. In addition, the study measured combustible cigarette smoking along the same margins. Two-way fixed effects logistic regression models were used to estimate the relationship between ENDS taxes and youth ENDS use. Models were adjusted for respondent's demographic characteristics and state-level controls for combustible tobacco policies, ENDS policies, alcohol policies, and drug policies. **Results:** ENDS taxes were associated with a statistically significant ($p < .05$) reduction in ENDS use among heterosexual-identifying youths, as measured by any, frequent, and everyday ENDS use. However, for LGBQ youth, ENDS taxes were not significantly associated with ENDS use. We find that ENDS taxes had the unintended consequence of widening disparities in LGBQ versus heterosexual youth tobacco use. **Discussion:** The findings show that a one dollar (in 2021$) increase in ENDS taxes reduces prior-month ENDS use among heterosexual teens by 4 percentage-points and habitual ENDS use by 2 percentage-points. In sharp contrast, queer youths' ENDS use is largely unresponsive to taxes. Taxes significantly widen disparities in vaping between queer and straight teens. Descriptive analyses suggest that LGBQ youths' tax insensitivity may be explained by their use of e-cigarettes to cope with unique stress-related psychological challenges, including those associated with targeted bullying victimization. **Implications for Health Policies:** The findings suggest unintended consequences of ENDS taxes on disparities in ENDS use. They also suggest that ameliorating psychological trauma of LGBQ youth could result in tobacco control policies being more effective at curbing LGBQ youths' ENDS use. **Implications for Further Research:** Our findings highlight challenges to policymakers aiming to curb queer teens' tobacco use. They also that supply-side restrictions, such as raising the minimum legal purchasing age from 18 to 21 may be more effective at curbing tobacco use among LGBQ young adults.

11:00 AM –12:30 PM WEDNESDAY [Health Beyond The Health System]

Bali International Convention Centre – Nusantara 1

Violence: Impacts of and Policies to Address

MODERATOR: **Yuki Kanayama**, Keio University

Ind-22 The Impact of Intimate Partner Violence on Healthcare Utilization: Evidence From Vietnam

PRESENTER: **Dung Le**

The World Health Organization recognizes violence against women as a violation of human rights, a barrier to gender equality, and a global public health problem. The most prevalent form of VAW is intimate partner violence (IPV). Women experiencing IPV are significantly more likely to experience physical and mental health problems. While evidence on the relationship between IPV and healthcare utilization in low-imcome countries is scarce, studies in high-income countries have found that women experiencing IPV are more likely to use medications for pain and mental compared to non-abused women. However, these studies on healthcare utilization in high-income contexts cannot establish causality because none have addressed the endogeneity of IPV. Unobserved factors influencing both IPV and healthcare utilization could bias the results. For example, an addicted husband can affect both the likelihood of experiencing IPV and healthcare service utilization of his wife. In addition, the results estimated from high-income countries may not be directly applicable to low-income countries due to notable differences between these two economic regions in IPV prevalence, healthcare systems, economic development, and social norms. To address this research gap this study examines the effects of IPV on healthcare utilization among women in Vietnam, a lower-middle income country with a strong gender role within families. We employ an instrumental variable (IV) based on whether women report their mothers-in-law being beaten during their husbands' childhood. This approach leverages the potentially exogenous variation in a mother-in-law's exposure to violence during his son's childhood, which may influence a husband's propensity for violence later in life, but is unlikely to directly affect his wife healthcare utilization. It is crucial to note in our context that daughters-in-law did not witness their mothers-in-law being beaten and that the relationship between daughters-in-law and mothers-in-law only forms upon marriage. Thus, knowledge of a mother-in-law's experience with domestic violence during her son's childhood is unlikely to directly influence a daughter-in-law's healthcare utilization. Utilizing the National Survey on Domestic Violence against Women in Vietnam, our two-stage least squares (2SLS) estimations show that a one standard deviation increase in the IPV index led to an increase in the use of medication and outpatient visits by about 36.1% and 37.4%, respectively. These results are robust to several checks, including an alternative measure of IV and IPV, estimation using a control function instead of 2SLS, and placebo outcomes. Further analyses reveal that the effects were heterogeneous by women's and their husbands' education, place of residence (e.g., urban and rural

areas), and ethnicity. As guided by the Grossman demand-for-health model, we examine possible mechanisms through which IPV might influence the outcomes and find that IPV appears to increase the use of medication and outpatient healthcare services due to its negative effects on health outcomes. By understanding the complex interplay between IPV and healthcare utilization within the Vietnamese context, this study informs the development of effective interventions to improve women's health and well-being.

Ind-474 Bidirectional Intimate Partner Violence during pregnancy and Symptoms of Anxiety and Depression in Pregnant and Postpartum women in China

PRESENTER: **Rong Li**
AUTHOR: Li Lu

Background Intimate partner violence (IPV), remains a critical public health concern, especially bidirectional IPV (BIPV) that involves both victimization and perpetration. Pregnant and postpartum women who exposed to BIPV may experience adverse effects on maternal and infant health. This study aims to explore the contribution of BIPV on mental health of pregnant and postpartum women.

Method Pregnant and postpartum women visiting outpatient clinics of six hospitals were recruited through random sampling. Questionnaires were used to collect information on sociodemographic characteristics, BIPV during pregnancy, and anxiety and depressive symptoms. Machine learning algorithms and multinomial logistic regressions were employed.

Results Of the 1,522 pregnant and postpartum women, 10.1% and 9.5% reported ever being IPV victims and perpetrators during pregnancy, while 8.1% reported with BIPV, 5.7% and 3.9% were with psychological and physical BIPV, respectively. Random forest model identified IPV status contributed the most to comorbid anxiety and depression symptoms, followed by household income and relationship with partner. Compared with individuals without any IPV exposure, those with BIPV, psychological and physical BIPV exhibited greater associations with comorbid anxiety and depressive symptoms (OR: 11.49, 95% CI: 6.39-20.07; OR: 11.42, 95% CI: 5.97-21.86; OR: 13.96, 95% CI: 6.81-28.62). Subgroup analyses showed that participants with lower house income and poorer relationship with partner presented greater odds compared with their counterparts while with overlapping 95% CIs.

Conclusion BIPV during pregnancy was associated with highly increased odds of comorbid anxiety and depression symptoms, with strongest association being noted for physical BIPV. Tailored prevention and intervention strategies are imperative.

Key words: Intimate partner violence; Pregnant and postpartum women; anxiety symptoms; depression symptoms; China

Ind-658 Healthcare Responding to Violence Against Women and Girls in Brazil: A Difference-in-Difference Analysis of a Case-Control Observational Study

PRESENTER: **Estela Capelas Barbosa**, City, University of London
AUTHORS: Stephanie Pereira, Ana Flavia Oliveira

Background: Violence against women and girls (VAWG) is a global public health issue and a breach of human rights, with consequences that affect physical and mental health and that have cost implications to healthcare systems. Globally, it is estimated that between 15% to 70% of women and girls experience violence at least once in their lifetime. Yet evidence of effective healthcare-based interventions is still sparse, particularly in low and middle income countries (LMICs). This paper evaluates an intervention implemented within the primary care system with and embedded referral pathway of specialist support for identified victim-survivors within the Brazilian National Health service (SUS – Sistema Unico de Saude).

Methods: The intervention was delivered across two regions of the metropolitan area of Sao Paulo between November 2018 and August 2021. For each outcome (identification and referral), we compared the eight intervention practices (four per region) to the remaining (untrained) clinics in those areas (11 in West region and 22 in South region). Thus we ended with a final sample of 41 clinics (8 intervention / 33 control). We used a difference-in-difference design and explored absolute effects of the intervention on outcomes, controlling for panel and time only and using negative binomial regressions controlling additionally for patient inflow, clinical supervision, covid lockdown, region and clinic for a more nuanced understanding of the effects of the intervention.

Findings: We found that the intervention increased the probability of identification by 47·2p.p. (95%CI 0·177-0·766) and the probability of referral by 38·4p.p (95%CI 0·033-0·734), when adjusting for panel effects and time and that the results are even larger when additionally controlling for patient inflow, region, clinical supervision, clinic, covid lockdown (82·5p.p for identification [95%CI 0·444-1·207] and 87·6p.p for referrals [95%CI 0·465-1·289]). Given there was no randomisation of clinics and that this was an observational study, we also found that intervention practices were significantly more likely to identify and refer patients at baseline. While controlled for COVID lockdown in Sao Paulo, due to our expectation that it would reduce the capacity of clinics to see patients, but found no significant effect of the lockdown.

Conclusion and policy implications: This study is, to our knowledge, the first to use a quasi-experimental design to evaluate a complex intervention in violence prevention, implemented in primary care settings in Brazil. The intervention was effective at increasing identification and referral of women experiencing violence and presenting at primary care settings and most have accepted the specialist support provided by the referral pathway. Intervention clinics were more likely to identify and refer before the intervention, suggesting the clinics that enrolled in the programme were *a priori* more engaged in violence response. This suggests that the intervention may be more effective in clinics that find VAWG prevention interventions more acceptable, at least in Brazil. Given reducing VAGW is one of the sustainable development goals, policy makers and funders should explore expanding this tested intervention into other regions of Brazil and possibly exploring effects in a randomised controlled trial.

Ind-682 Can Marijuana Legalization Impact the Prevalence of Domestic Violence?

PRESENTER: **Sara Hutchinson Tovar**

AUTHORS: Rachel Knott, Umair Khalil, Sonja De New

Substance use—particularly alcohol and opioids—is a significant risk factor for intimate partner violence (IPV), through mechanisms such as heightened household stress, impaired self-control, and increased aggression. In contrast, less is known about the effects of marijuana, despite it being one of the most widely used psychoactive substances globally. Marijuana use may theoretically reduce aggression due to its sedative properties, but high doses can also induce paranoia and agitation. Moreover, marijuana laws may influence the use of other substances, acting as substitutes or complements, thereby indirectly affecting IPV risk.

This study estimates the causal effect of Recreational Marijuana Laws (RMLs) on IPV using variation in the timing of RML adoption across U.S. states from 2000 to 2019. We combine administrative crime data from the National Incident-Based Reporting System (NIBRS)—which includes incident-level reports involving intimate partners—with policy data on marijuana legislation. The primary outcome is the number of IPV incidents at the city-year level, disaggregated by severity: aggravated assault, simple assault, rape, and intimidation. We employ a staggered difference-in-differences design using the Callaway and Sant'Anna (2021) estimator to account for variation in treatment timing.

We find no significant impact of Medical Marijuana Laws (MMLs) on IPV. In contrast, RMLs are associated with an 18% decline in aggravated assault and a temporary reduction in rape (7.4–11.5%) in the four years following legalization. Simple assault increases by 8%, while intimidation shows no clear trend. As potential mechanisms, we show that RMLs increase adult marijuana use by 38% without affecting alcohol consumption, while MMLs lead to smaller increases in marijuana use (10%) and a slight decline in alcohol use (3%). These patterns suggest that RMLs may reduce more serious forms of IPV, potentially due to substitution away from more violence-inducing substances. The findings are consistent with prior evidence linking marijuana legalization to declines in other violent and property crimes.

Ind-2393 The Impact of Pacification Police Units on Healthcare Service Provision in Rio de Janeiro's Favelas

PRESENTER: **Vinicius Pecanha**

AUTHORS: Rudi Rocha, Thomas Hone, Julia Guerra, Christopher Millett, Joana Monteiro

We investigate the impact of Rio de Janeiro's favela pacification program initiated in 2008 on healthcare utilization. Before the implementation of Pacifying Police Units (UPPs), Rio de Janeiro faced persistent violence driven by drug trafficking factions that controlled favelas, leading to frequent armed conflicts with police and rival groups; the UPPs aimed to reduce violence by establishing a permanent police presence in some of these areas to reclaim state control and improve security. Using a difference-in-differences model, we analyzed detailed data from 128 healthcare clinics near pacified and non-pacified favelas between 2009 and 2016. Our findings reveal that the UPP program significantly increased health procedures in clinics near pacified areas, stressing the role of improved safety in reducing barriers to healthcare use. These results shed light on the broader implications of violence reduction on public service utilization and emphasize the need for integrated policies to address social determinants of health in vulnerable communities.

11:00 AM –12:30 PM WEDNESDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Bougainville

Organization and Management at the Provider and Condition Level

MODERATOR: **Emma Dean**,

Ind-2757 Hospital Market Dynamics: Prices, Capital Expenditures and Hospital Withering

PRESENTER: **Michael Chernew**

AUTHORS: Mr. Michael E. Chernew, Andrew Hicks

Hospital prices have attracted considerable policy attention because they are on average high, growing rapidly, and vary considerably within markets. Research and policy attention has centered on hospital and physician consolidation. We investigate another potential mechanism driving price increases involving shifts in market share towards higher price hospitals. We believe capital expenditures play a pivotal role in these market dynamics. Specifically, we hypothesize a positive feedback loop beginning with higher-priced, more profitable hospitals disproportionately undertaking capital projects that expand existing capacity, add service lines, improve amenities, or support entry into adjacent geographic markets. These capital investments lead to shifts in patient flows toward hospitals investing heavily and away from rivals that are investing less. These shifts in demand translate into larger price increases at expanding hospitals thus positioning these higher-priced hospitals for future expansion. Over time, these market dynamics have the potential to contribute to higher concentration of market share (some hospitals grow and others wither) and higher prices – both at investing hospitals and market wide.

We use annual 2010-2019 data from government reporting systems on hospital characteristics, capital expenditures, and volume of services delivered. We use a national commercial claims data set to compute standardized prices. The study sample includes 2,501 hospitals geographically distributed across 262 markets. In our first set of analyses, we characterize the distribution of capital expenditures and examine the relationships at baseline between capital expenditures, price, and hospital characteristics to assess whether hospitals with larger capital investments had higher baseline prices. In our second set of analyses, we examine the relationships between capital investment and changes in hospital volume, market share, and prices. Our hypothesis is that hospitals that invest more in capital gain market share and raise prices whereas hospitals that invest relatively less in capital lose market share and increase prices less.

We find that hospitals in better financial health [total margins (6.0 vs. 2.3), net income (946 vs. 218)] and higher baseline prices (1.02 vs. 0.94) made capital investments that were more than five times larger than those of financially weaker hospitals with lower baseline prices. Second, we find that capital expenditures were positively associated with changes in hospital volume and market share; a 10% difference between the hospitals' capital expenditures was associated with a 2.0% difference in percent change in market share. Third, we find that hospitals with larger capital investments experience greater price increases than rivals with lower capital investments; the difference in estimated prices between hospitals in the lowest and highest deciles of capital expenditures nearly doubled between 2012 and 2019.

In summary, we find that hospitals investing more in capital gain market share and raise prices whereas hospitals investing relatively less in capital lose market share and increases prices less. Taken together these forces perpetuate a cycle of expanding and withering hospitals. Study findings suggest important limits to antitrust as a mechanism to address high and rising prices and could inform policies to forestall or eliminate the financial decline of withering hospitals thereby preserving access and promoting competition.

Ind-766 Does Algorithmic Risk Assessment Affect Physician Prescribing? Understanding Aggregate Versus Micro-Level Impacts

PRESENTER: **Emma Dean**
AUTHORS: Daniel Kaliski, E. Mallick Hossain

Background

Artificial intelligence (AI) tools have the potential to improve medical decision making, but their adoption has outpaced regulatory frameworks and quality assessments. This leaves open questions as to their real-world applicability and reliability.

In the U.S., many AI decision-support systems are implemented in clinical practice without regulatory approval or clinical validation on the part of manufacturers, which involves assessing their accuracy and effectiveness in the real-world. We examine the impact of one such widely used tool, NarxCare, a proprietary AI algorithm that generates a score indicating a patient's risk of unintentional opioid overdose. The U.S. opioid epidemic, a severe public health crisis, caused over 81,000 opioid-related deaths in 2023. In response, many U.S. states provide NarxCare scores to physicians as part of their Prescription Drug Monitoring Programs, with some requiring physicians to view NarxCare output before prescribing opioids. NarxCare's widespread use has the potential to impact one billion patient encounters annually, but it is unregulated and has not been clinically validated* by the manufacturer*.*

Research Question

How does NarxCare impact physician prescribing and patient outcomes, and how do these effects vary by patient characteristics?

Methods

We develop a theoretical model of Bayesian updating to develop hypotheses of physician behavior changes in reaction to NarxCare. We test these hypotheses using hand-collected data on NarxCare implementation dates across U.S. states and 2015-2022 MarketScan medical claims data from over 250 million patients. This detailed billing data includes physician characteristics as well as patient demographics, procedure and diagnosis codes, prescription fills, and insurance information.** Exploiting the fact that U.S. states introduced NarxCare at different points of time, we run a staggered difference-in-differences model, allowing for dynamic heterogeneity in treatment effects by following Calloway and Sant'Anna (2021).

Results

Our national analysis shows no overall impact of overdose algorithms on opioid prescriptions. However, this aggregate null effect masks significant heterogeneity across patient groups: physicians increased prescribing for opioid-naïve patients (a continuous rise of 0.0032 percentage points over time, $p < 0.001$) but decreased prescribing for patients with a history of safe opioid use (an immediate reduction of 0.0287 percentage points, constant over time, $p < 0.001$). Consistent with our theoretical model, physicians responded more strongly to the algorithm when treating a patient for the first time.

Significance

We find that physicians are most likely to rely on algorithms or decision-support tools when they have limited background or history with a patient. However, this behavior change varies across patient types: physicians initially reduce prescribing for patients with a history of opioid use, while they increase prescribing for opioid-naïve patients. This raises two concerns: 1) a low NarxCare score does not necessarily indicate a low risk of long-term addiction but leads to increased opioid prescriptions, and 2) patients with limited access to care are more likely to see different doctors at each visit, raising both the risk of "false positives" and reliance on the algorithm. Our findings underscore the need for clinical validation of AI tools, as their use in practice may affect patient safety outcomes.

Ind-340 Managed Care Mechanisms, Patient Selection and Provider Behavior: How Do Provider Networks Reduce Medical Spending?

PRESENTER: **Lukas Kauer**
AUTHORS: Daniel Ammann, Tobias Müller, Aurélien Sallin

Objective: Managed care systems often incentivize the utilization of provider networks which aim to improve the treatment of patients by

coordinating the entire course of care. We study how managed care mechanisms change physician behavior through provider networks. A special focus is laid on cost implications and unnecessary screenings. **Methods:** We analyze the effect of provider networks on costs as well as the provision of unnecessary care based on a staggered difference in difference design. We follow patients enrolled in the family doctor model whose physician joins a provider network at some point in time. We use patients whose physician joins the network at a later point as a comparison group. We focus on one large physician network in the French-speaking part of Switzerland that obliges members to participate in periodical quality circles. The quality circles focusses, among other things, on clinical guidelines regarding unnecessary care such as the "top-5-list" of "smarter medicine–Choosing Wisely Switzerland". In addition, the network provides software and feedback on their practice to the physicians. No other managed care mechanisms are employed. Our primary cost outcomes include inpatient and outpatient services, medications, laboratory testing and vaccination costs. Outcomes indicating unnecessary screenings are the number of vitamin D tests and PSA screenings. **Results:** Preliminary results show a post treatment level shift in total costs. The point estimates indicate cost reductions of up to 15%. The main drivers of the cost reductions seem to be outpatient and medication costs. This finding indicates that the managed care mechanisms used by the network might systematically change medical practice and reduce resource use through changes in examination and prescribing behavior. We are waiting to receive more data to reveal whether physicians see their patients less often or for a shorter time, refer them to less costly specialists and whether they prescribe cheaper drugs. The network switch, on the other hand, seems to have no effect on the number of vitamin D tests and PSA screenings which are often considered of low value for patients. Here, the point estimates are close to zero and not statistically significant. This indicates that physicians do not adjust their own testing behavior when joining a physician network. **Discussion:** Our results are relevant for policy makers insofar as that they show that managed care systems can reduce costs in the medical sector even if no financial incentives are utilized on the physician level. On the other hand, they seem to have no effect on the administration of the unnecessary screenings we observe.

Ind-781 Practice of Chronic Disease Management at County Level in China from the Perspective of Professional Integration: A Qualitative Case Study

PRESENTER: **JIA HU**
AUTHORS: YING ZHENG, LI LI

Background: Chronic diseases have become an important factor affecting global people's health, mostly in low- and middle-income countries, which aggravates the health inequity and affects the achievement of Universal Health Coverage and the Sustainable Development Goals.** It is currently the most cost-effective management model to have multiple professionals from relevant institutions collaborate so as to provide integrated chronic disease management services. The "classified, color-coded, hierarchical and regionalized" chronic disease management model in Youxi County, Fujian Province is a typical case in China. However, related research is limited. This paper aims to analyze the practice measures and lessons learned in Youxi County, focusing on the professional integration of service providers. **Methods:** From January to March 2021, interviews with 15 key informants including policy makers and implementers of chronic disease management in Youxi County were conducted to collect qualitative data, which was analyzed by the thematic framework method as well as the policy data, using the professional integration dimension in the evaluation framework of the integrated healthcare system. **Results:** Under the governmental institutional supply and the organizational support of the county healthcare alliances, Youxi County selected four types of the main chronic diseases (hypertension diabetes, severe mental disorders and pulmonary tuberculosis) to conduct the management model. A series of measures were taken, such as improving the professional division and collaboration mechanism, establishing the incentive and restraint mechanism geared toward chronic disease management, formulating norms and standards of chronic disease management for patients with different color labels, and promoting the compatibility of inter-professional value and culture under the governmental institutional supply and the organizational support of the tight county healthcare alliance in Youxi County, to prompt professionals of different levels and types to collaborate in order to provide integrated chronic disease management services. However, some problems remained, such as limited capacity of primary health care, the relatively narrow range and weak effect of the incentive and restraint mechanism, inadequate implementation of the norms and standards, and so forth. **Conclusions:** The chronic disease management model in Youxi County of Fujian Province is a beneficial exploration and innovative practice of an integrated chronic disease management model on the basis of county healthcare alliances reform, which provide reference for other regions in China and other low and middle-income countries. Targeted measures should be taken to improve the model, and long-term follow-up surveys and mixed research designs are required in the future to enrich relevant evidence.

Ind-791 Length of Stay and Healthcare Costs in Chinese Middle and Older Adults with Cardiometabolic Disease and Different TCM Syndromes

PRESENTER: **Dr. Jingjing Zhou, MD**, School of Public Health and Management, Guangzhou University of Chinese Medicine
AUTHORS: Xiyin Chen, Anran Li, Yulin Gao, Guanyang Zou, David Bishai

Background: Previous studies have shown variations in Length of Stay (LOS) and healthcare costs between Traditional Chinese Medicine (TCM) and non-TCM care. However, little is known about the predictive value of an assigned TCM syndrome for LOS and healthcare costs. TCM hospitals where both Western Medicine (WM) and TCM are dually practiced can offer an opportunity to discover systematic differences in LOS for cases with the same International Classification of Diseases, Tenth Revision (ICD-10) code based on the TCM syndromes that patients were assigned at admission.

Objectives: To assess the predictive value of an assigned TCM syndrome in predicting LOS in Chinese middle and older adults with cardiometabolic diseases (CMD).

Methods: This retrospective cohort study analyzed 553,781 admissions (2017–2022) of patients aged ≥45 with CMD across 25 TCM hospitals in a city in China. Inclusion criteria required the LOS to be between 24 hours and 90 days. Fixed-effects panel regression models were developed to identify predictors of the log value of LOS, with subgroup analyses stratified by hospital level (Tertiary-A vs. non-Tertiary-A). The incremental explanatory power of TCM diagnoses was quantified through adjusted R^2 comparisons between baseline models (demographic, clinical, and administrative covariates) and models incorporating TCM syndromes or ICD-10 codes.

Results: Median LOS was 8 days (IQR 5-12) at baseline. Data on assigned TCM syndrome improved model explanatory power by 32%. The adjusted R^2 for the log value of LOS increased from 0.0490 to 0.0648 (ΔR^2=0.0158), surpassing the incremental contribution of ICD-10 codes (ΔR^2=0.0100). Tertiary-A Hospitals demonstrated stronger TCM-LOS associations (R^2=0.0703 vs. 0.0411 in non-Tertiary-A Hospitals).

Conclusions: This study successively incorporated WM and TCM syndromes into LOS models. TCM diagnosis improved the statistical prediction of the log value of LOS. Actuarial predictions of a population's expected utilization will be improved by adding data on TCM diagnoses in systems where those data are available. Policy implications highlight that adding TCM diagnosis to diagnosis-related groups (DRGs) will improve statistical prediction capabilities.

Key words: cardiometabolic diseases, TCM syndromes, length of stay, middle and older adults, fixed effects model

Ind-2205 Challenges to Integrated Care under China s New Case-Based Payment System: Impacts on Inpatient Volume Distribution within Medical Alliances

PRESENTER: **xinyi peng**
AUTHOR: yingchun chen

Background In 2020, China introduced an innovative case-based payment method called"Diagnosis-Intervention Packet (DIP)". It expected to achieve cost containment and improve service efficiency. However, similar to DRG, the DIP uses a single hospitalized case as the unit of payment. We concerned that this fragmented payment system could undermine the existing integrated healthcare service structures, specifically medical alliances—collaborative networks of hospitals and primary medical institutions. The economic incentives created by DIP may exacerbate competition for patients within these alliances, leading to a redistribution of inpatient volume. This study aims to examine the impact of DIP on the structure of inpatient volume distribution within medical alliances. **Methods** We collected monthly inpatient service volume data from 28 healthcare institutions within two medical alliances in County X, covering a continuous 36-month period from 2020 to 2022. We employed a single-group interrupted time series analysis (ITSA) to perform a stratified analysis of hospitals and primary medical institutions within the medical alliances. Considering the potential for distinct economic incentives resulting from differences in payment standards across different health insurance types (UEBMI and URRBMI), we further conducted a heterogeneity ITSA analysis based on insurance type. **Results** After the DIP reform, the number of patient discharges in hospitals for both UEBMI and URRBMI inpatients has shown an upward trend. The number of discharges for URRBMI inpatients increased by an average of 179 per month (P=0.028), while UEBMI inpatients saw an average increase of 15 per month (P=0.094). However, there was no significant change in the discharge numbers for primary medical institutions. The proportion of discharges from hospitals within the medical community also showed an upward trend. For URRBMI inpatients, the proportion increased by an average of 0.0135% per month (P=0.094), while for UEBMI inpatients, the proportion increased by an average of 0.0153% per month (P=0.03). **Conclusion** The DIP has intensified internal competition within medical alliances. Hospitals with greater medical capabilities, driven by the economic incentives of case-based payments, treat increased inpatient volume as a profitable opportunity. This has led to the inducement of unnecessary hospitalizations and the siphoning of inpatient cases from primary care institutions, resulting in a concentration of patients at hospitals. **Keywords** Innovative payment method, Medical alliances, inpatient volume distribution

Ind-808 Comorbidity Pattern of Depression and Anxiety and Difference of Core Symptoms in the Elderly With Multiple Chronic Conditions: a Network Analysis

PRESENTER: **Junjie Jiang**
AUTHORS: Qiwen Song, Wenbin Liu

Background: Multiple chronic conditions (MCCs) seriously worsen the health status of the elderly, resulting higher prevalence of depression and anxiety and more severe symptoms. Previous studies regarded depression and anxiety as a single construct to examine the linear association between depression, anxiety and MCCs. A lack of attention to specific manifestations of depression and anxiety may lead to an incomplete understanding of the mechanisms underlying the comorbidity of these two disorders. Furthermore, individuals may exhibit markedly disparate patterns of symptoms and outcomes, despite a comparable overall level of anxiety or depression. However, the heterogeneity of the pattern of anxiety and depression comorbidity and the interrelationship between symptoms in the elderly with MCCs have not been fully studied. **Methods:** We included 4176 participants with MCCs and aged above 65 from Chinese Longitudinal Health and Longevity Survey (CLHLS 2017-2018). Depression was assessed with the 10-item Center for Epidemiologic Studies Depression Scale (CESD-10) while anxiety was measured by the Generalized Anxiety Disorder scale-7 (GAD-7). Latent profile analysis (LPA) was employed to identify the subgroups of the elderly with MCCs with similar patterns of symptoms. Network analysis (NA) was used to elucidate the structural characteristics of the depression-anxiety comorbidity network with utilized "bridge strength" as centrality indices to characterize this network. Network stability was tested using a case drop bootstrap program. A Network Comparison Test (NCT) was performed to examine the differences in network characteristics across LPA subgroups.* ***Results:*** *LPA identified two distinct patterns of comorbidity: high comorbidity (n = 709) and low comorbidity (n = 3467). The value of centrality indices was 0.75, indicating that the network structure was sufficiently stable. NCT revealed a significant difference in global strength between the networks (S = 0.733, *p* < 0.001). GAD1 (nervousness), CESD1 (bother by things), GAD3 (excessive worry) were identified as common bridge symptoms for both networks. CESD10 (sleep quality) was exhibited as a unique bridge symptom in the high comorbidity network while CESD4 (Everything was an effort) presented as a unique bridge symptom in the low comorbidity network. **Conclusion:** Depressive-anxiety pattern in Chinese elderly with MCCs can be categorized into a high comorbid or a low comorbid group. Implementing targeted interventions are effective in regulating sufferers' mood and improving their mental health. In addition to GAD1 (nervousness), CESD1 (bother by things), and GAD3 (excessive worry) can be common targeted interventions, CESD10 (sleep quality) and CESD4 (Everything was an effort) were respectively recommended as unique targeted interventions for the two group. **Keywords:** Depression, Anxiety, Elderly with MCCs, Latent profile analysis, Network analysis

Ind-998 The Effect of Psychological Contract on Employee Turnover in the Public Hospitals: Evidence from China

PRESENTER: **Yiya Zhao**
AUTHORS: Huatang Zeng, Yao Chen, Shuying Yin

Background: The quality of the staff and the stability of the team in public hospital are directly related to the quality and effectiveness of healthcare services. However, the healthcare work environment has become more tense and severe, and gradually healthcare staff have resigned or transferred. The shortage of healthcare staff not only disrupts the order of diagnosis and treatment, hinders the normal operation of the healthcare system, but also affects the lives and health of the people. Previous studies have highlighted that the fulfillment of psychological contracts fosters positive employee behavior, whereas unfulfilled psychological contracts are prone to incite negative emotions and increase turnover intentions. Many countries are paying more attention to the inner demands of healthcare staff, especially in low/middle-income countries. Analyzed the psychological contract status of staff in public hospitals and its effect on the tendency to leave, which will help hospital managers take corresponding measures to stabilize the professional team of physicians. **Methods:** This cross-sectional study was conducted among healthcare staff at 11 public hospitals in Shenzhen, and 674 valid questionnaires were collected. By collecting sociodemographic information of healthcare staff, levels of psychological contract and intentions turnover, and using logit regression to analyze the impact of psychological contract on turnover intention. **Results:** Combined with China's cultural and social background, the psychological contract can be divided into three dimensions (normal, interpersonal and developmental). Normal contract refers to the working environment and material benefits. Interpersonal contract means that the organization provides a good interpersonal environment for employees. Developmental contract is an organization that provides employees with professional development space that enables them to realize their full strengths and potential. The overall score of health staff in public hospitals was 3.57±0.70; the average scores of the three dimensions in the psychological contract were 3.70±0.71 for developmental, 3.69±0.75 points for interpersonal, and 3.32±0.85 for developmental contracts from high to low; the differences in psychological contract among healthcare staff of different genders, ages, education, hospital types, years of work, and income levels were statistically significant ($P<0.05$). The average score of turnover intention was 2.54±1.12. The main reasons for turnover include the reward is not proportional to the return (26.7%), inappropriate workload (15.6%), and incomplete security welfare system (14.0%). The regression results show that after controlling for relevant factors, psychological contract has a significant impact on turnover intention. Among them, the normal contract (OR=2.09, $P<0.001$) and developmental contract (OR=2.27, $P<0.001$) have a significant positive predictive effect on turnover intention, and the contribution rates of normal and the developmental contracts to turnover intention are 30.32% and 29.42% respectively. **Conclusions:** The psychological contract of health staff in Shenzhen public hospitals is above average, and the overall turnover intention is low. The turnover intention of health staff is affected by the psychological contract. Hospital managers should take effective measures in transaction responsibility and development responsibility, to protect the reasonable rights and interests of health staff and reduce their willingness to leave.

Ind-1052 Using Systems Dynamics to Model Policies Influencing the Supply and Demand for Dialysis Services in Thailand

PRESENTER: **Siobhan Botwright**
AUTHORS: Kinanti Khansa Chavarina, Natcha Yongphiphatwong, Itamar Megiddo, Jeerath Phannajit, Jiratorn Sutawong, Yot Teerawattananon, Le Khanh Ngan Nguyen

Background

Kidney failure represents a growing burden globally, particularly in settings with limited resources and infrastructure to provide life-saving access to dialysis or transplant. Given the considerable budget and healthcare resources required, many governments are seeking to incrementally expand access to dialysis, requiring policies that build supply whilst managing demand within resource constraints. In Thailand, access to dialysis was initially provided through peritoneal dialysis (PD), with patients only reimbursed for haemodialysis (HD) if contra-indicated. Whilst successful in increasing access, the policy was criticised as restrictive and changed in 2022 to free choice between HD and PD. Contrary to initial projections, there was an unforeseen explosion in total dialysis patients, overwhelming the healthcare system and resulting in significant budget overspend.

This study was undertaken as part of a broader programme of work to understand the factors influencing dialysis supply and demand following the 2022 policy change, to propose policy goals, and to evaluate policy interventions to achieve those goals. In this study, we aimed to model the dynamics of supply and demand, to project the impact of proposed policy options over a 5-year horizon.

Methods

We adopted a systems dynamics approach, to account for health system complexity, delays between cause and effect, and feedback loops between supply and demand. In consultation with stakeholders, we iteratively developed a causal loop diagram, to incorporate multiple views around supply and demand of dialysis services. The resulting causal loop formed the structure of a system dynamics model built in R. The model was populated with data from national databases, published studies, and surveys to dialysis providers. For parameters with no available data, we determined feasible ranges through expert opinion and conducted multi-parameter optimisation for calibration. Structural uncertainty analysis was conducted on the functions of equations and structure of feedback loops. Parameter uncertainty was assessed through one-way sensitivity analysis and Latin hypercube sampling. Steps for model validation included face validity, extreme condition, and model behaviour tests. The model was calibrated using 2022 data and showed a good fit to service utilisation in 2021 and 2023.

Results

Under the current policy, the model projected 126,000 new dialysis cases from 2025-2029. Due to the widespread but unofficial practice of

paying doctors for referral of patients to HD, it was estimated that 24% of projected new cases would come from premature dialysis initiation. Only policy interventions directly or indirectly addressing these financial incentives for doctors were projected to achieve the policy target of more than 50% new dialysis cases on PD. Effective interventions in the literature, such as education by multi-disciplinary teams and bundled payment, had lower impact. A fixed global dialysis budget was estimated to have the greatest reduction in HD cases, but at the expense of equal access, with low profits causing private HD centres to close.

Discussion

Successful interventions in other countries had limited impact, highlighting the low transferability of health system interventions between settings. Our study illustrates system dynamics as a tool to inform context-specific policies for health service supply and demand.

Ind-2204 Home-Based Pharmacy Care Setting for Paediatric Epilepsy: Insights from Quasi-Experimental Research in Bali, Indonesia

PRESENTER: **Kadek Hendra Darmawan**
AUTHORS: Ayu Made Dwijayanti, Dewa Ayu Putu Satrya Dewi, I Gusti Ayu Rai Widowati, Ni Made Maharianingsih

Background: In Indonesia, epilepsy is a chronic disease that can be diagnosed in individuals of all ages and genders. It is estimated that there were between 700,000 and 1,400,000 cases of epilepsy in the country in 2016. In low- and middle-income countries including Indonesia, epilepsy is associated with high morbidity rates, primarily due to an underprepared healthcare system. Additionally, the nature of epilepsy, which requires a complex regimen of medications, often leads to ineffective treatment, particularly among children, whose medication adherence rates range from 50% to 60%. To address this issue, a new healthcare setting provision of home pharmacy care presents a plausible solution to bridge the gap in adherence to epilepsy treatment regimens, especially for children, as demonstrated by this interventional case study in Bali, Indonesia.

Research purpose: This study aims to provide evidence on the effectiveness of home-based pharmacy care setting as an alternative healthcare provision to improve adherence to epilepsy medications in children.

Methods: A quasi-experimental research design with control and intervention groups and a time-series approach was applied. Purposive sampling was used to determine the intervention and control groups, with pre- and post-tests conducted twice during the period of March-April 2024. Children aged 1-12 years diagnosed with both common seizures (*tonic, tonic-clonic, and absence*) as well as partial seizures were included. The pill count observational method was used to assess adherence, with categorical scores of $80 \geq x \leq 80$. To assess the significant changes in adherence before and after the home pharmacy care intervention in both study groups, dependent and independent t-tests were applied.

Key results: In the intervention group (n=7), the adherence rate of children with epilepsy to their medication increased from 28.57% to 85.71% after receiving a series of interventions through home pharmacy care. In contrast, the pre-test and post-test results for the control group (n=7) showed a steady adherence rate of 28.57%. The dependent t-test for the intervention group showed p-values of 0.015 and 0.014 (<0.05), while the control group had p-values of 0.573 and 0.573 (>0.05). The independent t-test comparing the intervention and control groups resulted in a p-value of 0.022 (<0.05). These t-test results consistently indicated a significant difference in adherence levels between the intervention and control groups of paediatric epilepsy patients.

Conclusions and implications: Home pharmacy care has been evidence to provide improved medication adherence for paediatric epilepsy patients and could be considered a supplementary healthcare provision, particularly for managing the complex medication requirements of epilepsy in children.

Ind-1715 Prioritizing Stakeholders for TB Diagnostics Adoption in Indonesia: A Multi-Criteria Decision Analysis Approach

PRESENTER: **Gressdilla Geovani Pottera**
AUTHORS: Rozar Prawiranegara, Naufal Febryan Azzahra, Panji Fortuna Hadisumarto, Raspati Cundarani Koesoemadinata, Ari Natalia Probandari, Nury Fitria Dewi, Bachti Alisjahbana

Background: Tuberculosis (TB) remains a significant public health challenge in Indonesia, necessitating the adoption of innovative diagnostic tools to improve early detection and effective treatment. This adoption hinges on meaningful stakeholder engagement, but involving all potential stakeholders can be overwhelming and inefficient. This study identified and prioritized key stakeholders to form a Project Steering Committee (PSC). The PSC will drive the adoption of new TB diagnostic tools in Indonesia. **Methods**: This study incorporated Multi-Criteria Decision Analysis (MCDA) commonly used for health priority setting. The salience model was used as criteria to assess the relevance of potential PSC members based on their power to influence decision-making, legitimacy within the Indonesian healthcare system, and urgency of their involvement in relation to TB diagnostics. Our research involved a multi-stage process: (1) a comprehensive document review to map the TB diagnostics pathway in Indonesia and identify relevant actors; (2) the development of a stakeholder mapping matrix outlining potential PSC members and their attributes; (3) a criteria elicitation workshop; and (4) assigning scores stakeholder salience based on the identified criteria. This exercise resulted in a detailed stakeholder analysis, generating individual profiles, and potential engagement strategies. **Key Results**: From an initial pool of 30 potential individuals, MCDA analysis prioritized 16 key stakeholders for the PSC based on their composite salience scores. This data-driven approach ensured a rational and deliberative selection process, balancing representation from diverse perspectives including patients, healthcare providers, researchers, policymakers, and TB experts. The prioritized stakeholders demonstrated high levels of influence, legitimacy, and urgency within the Indonesian healthcare system, maximizing the potential for impactful engagement in TB diagnostics adoption. **Conclusion**: This study demonstrates the value of a structured, context-specific salience model for stakeholder prioritization. This

approach offers a robust and transparent method for identifying key actors in health interventions and policy formulation. The findings of this study provide practical guidance for researchers and policymakers seeking to optimize stakeholder engagement for TB diagnostics adoption and other settings. **Keywords:** MCDA, Stakeholder Engagement, Salience Model, Tuberculosis, Diagnostics

Ind-2145 Community Health in the Global Financing Facility (GFF) Planning Documents: Insights From Six West African Countries

PRESENTER: **Mr. Joël Arthur Kiendrébéogo**, University Joseph Ki-Zerbo
AUTHORS: Meghan Bruce Kumar, Issa Kaboré, Orokia Sory, Yamba Kafando, Asha S. George, Rosie Steege

Background Community health (CH) plays a critical role in ensuring equitable access to healthcare, particularly in settings where health systems face significant resource constraints. In francophone West Africa, where Reproductive, Maternal, Newborn, Child, and Adolescent Health and Nutrition (RMNCAH-N) indicators remain a concern, CH has the potential to bridge gaps in service delivery, especially for hard-to-reach populations. However, how CH supports integrated RMNCAH-N service delivery in this region is under-researched. This study examines how six francophone West African countries – Burkina Faso, Côte d'Ivoire, Guinea, Mali, Niger, and Senegal – support CH through the Global Financing Facility for Women, Children, and Adolescents (GFF). The GFF is a global health initiative that aims to accelerate progress toward universal health coverage and improve RMNCAH-N by mobilizing and aligning domestic and international financing. **Methods** We conducted a content analysis of Investment Cases and Project Appraisal Documents from the selected countries between July 2022 and October 2023. These documents outline strategic priorities and financing plans under the GFF. To guide our analysis, we defined the scope and developed a list of key search terms related to CH, including community health workers (CHWs), service delivery, governance, and financing. Using an iterative hybrid inductive-deductive approach, we identified themes for data coding and extraction. The extracted data were analysed to identify patterns, compare findings within and across countries, and group them into meaningful categories. **Results** Our analysis revealed a strong commitment to CH across all six countries. Each country's GFF documents highlight the importance of CHWs, who perform a wide range of preventive, promotive, and curative roles. These include immunization, antenatal care, family planning, and nutritional support, all of which contribute to improving RMNCAH-N. However, while CHWs' contributions are recognized, their remuneration and incentives vary considerably across countries, with some relying heavily on volunteerism or donor funding to sustain CHW programs. Most CH indicators in the analysed documents focus on CHWs' deliverables, including the number of home visits, immunizations administered, and pregnant women reached. However, few indicators address broader governance aspects, such as community participation in health planning or the integration of civil registration and vital statistics systems. Key challenges identified include weak leadership and governance structures, which undermine the coordination and oversight of CH initiatives. Additionally, financial and material resource shortages constrain CHWs' performance and limit service utilization. While some countries invest in CHW training and capacity building, these efforts are often insufficient to address systemic gaps. Structural reforms and broader community engagement remain underdeveloped, limiting the potential impact of CH interventions. **Conclusions** There is a need for more comprehensive and integrated approaches to CH, and to prioritize and mainstream CH interventions by embedding them into national health system planning and budgeting processes. This would help ensure sustainable financing and more effective use of CH to improve RMNCAH-N. Strengthening leadership, governance, and community engagement is essential to fully harness the potential of CH in francophone West Africa.

11:00 AM –12:30 PM WEDNESDAY [Economic Evaluation Of Health And Related Care Interventions]

os121 Bali International Convention Centre – Denpasar B

Value of Applying Artificial Intelligence in Health: Case Studies From China

MODERATOR: **Xuefei Gu**, China National Health Development Research Center

CONVENER: **Huanhuan Xu**, School of Health Management, Harbin Medical University

DISCUSSANT: **Alexander Morton**, National University of Singapore School of Public Health; **Bo Jin**, Dalian University Of Technology; **Mao You**, China National Health Development Research Center; **Yue Xiao**, China National Health Development Research Center

abs-os373 A Health Economic Evaluation of an Artificial Intelligence-Assisted Prescription Review System in a Real-World Setting in China

PRESENTER: **Xueqing Tian**, China National Health Development Research Center
AUTHORS: Di Wu, Liwei Shi, Kejun Liu, Wenqi Fu, Mr. Mao You, Ping Ren, Yingpeng Qiu, Ms. Yue Xiao, Junrui Pei

Background: Medication safety and irrational prescriptions have long been a concern in China. Primary healthcare institutions (PHIs), particularly village clinics, lack pharmacists and prescription review processes. **Objective:** This study aims to estimate the cost and evaluate the economic impact of a pilot using a artificial intelligence-assisted prescription review system (AIAPRS) in a rural county in China. **Methods:** A pilot project was conducted in Shucheng County, Anhui Province (a central province in China), which installed the AIAPRS in all 21 township health centers and 286 health clinics in 2024. A pre-post study with self-matched controls was conducted to examine the cost-effectiveness of the AIAPRS. The information platform designed for the pilot project facilitated the evaluation of both the quantity of irrational prescriptions across different risk levels and the associated drug expenses from March (established as the baseline) to June. Additionally, from the healthcare system perspective, the unit cost (in RMB per prescription audited) was estimated using the Activity-Based Costing approach. **Results:** The introduction of AIAPRS incurred a cost of 2.40 Yuan (CNY) per prescription audited, compared to zero prior to the pilot. During the baseline period, there were 18,527 irrational prescriptions per month, with a drug cost totaling CNY 1.9 million. Following three months of

implementation, the number of irrational prescriptions decreased to 11,564 per month, resulting in a total cost of CNY 1.6 million. This reduction represented a 6.0% decrease in the proportion of inappropriate prescriptions ($P < 0.05$). At the county level, the AIAPRS led to a 3.5% reduction in monthly irrational prescriptions over four months, yielding an average monthly cost savings of 125,929.4 CNY. **Conclusion:** The AIAPRS significantly enhances prescription quality at the grassroots level and reduces costs. **Keywords:** Artificial intelligence; Prescription review; Health economic

abs-os369 Economic Evaluation of Artificial Intelligence-Assisted Diagnosis of Coronary Heart Disease

PRESENTER: **Liwei Shi**
AUTHORS: Jiayu Zhao, Ms. Yue Xiao, Yingpeng Qiu

Objective Using coronary CT angiography intelligent assisted diagnosis (CCTA-AI) as the experimental group and coronary CT angiography manual diagnosis (CCTA-senior physicians, CCTA-junior physicians) as the control group, this study measured the cost-effectiveness and efficiency of the AI-assisted diagnosis system for the diagnosis of coronary heart disease from the perspective of the health system, and explored the clinical application value of AI-assisted diagnosis technology. **Methods** The study used activity-based costing to calculate the changes in CCTA examination costs and efficiency before and after the application of AI technology in five sample hospitals in Beijing; systematically searched Chinese and English databases such as PubMed and CBM, screened literature for meta-analysis based on inclusion and exclusion criteria, and calculated the combined effect size of the experimental group and the control group; used diagnostic accuracy as the effect value to calculate the cost-effectiveness of the experimental group and the control group; and constructed a decision tree model to simulate the cost-effectiveness of using CCTA-AI technology for one year in patients with suspected coronary heart disease. **Result** The cost calculation results showed that the average cost of CCTA-AI examination in the sample hospitals was 1,074.90 yuan (778.87-1,374.95), which was 191.71 yuan (15%) lower than that in the control group. Affected by factors such as "annual examination number" and "number of CT units involved in CCTA examination", the examination costs among institutions varied greatly. After the application of AI, 0.46 man-hours (0.17-0.67) could be saved for each patient examined. The results of meta-analysis showed that the diagnostic efficiency of the CCTA-AI group was significantly higher than that of the CCTA-low-senior physician group ($p<0.05$) and slightly higher than that of the CCTA-high-senior physician group ($p=0.73$). The combined sensitivity and specificity values of the CCTA-AI group were 0.86 (95%CI, 0.81-0.89) and 0.83 (95%CI, 0.77-0.87), respectively, and the AUC value was 0.91 (95%CI, 0.88-0.93). The cost-effectiveness analysis results based on diagnostic accuracy showed that the experimental group had an absolute advantage over the control group. The cost of the CCTA-AI group was 1,074,900 yuan and the effectiveness was 855.05. The model analysis results showed that the CCTA-AI group had the highest expected cost (50,656.74 yuan) and the highest utility value (0.82). Compared with the CCTA-senior physician group, the ICER value of the AI group was 2,969,386.32 yuan/QALY. **Conclusion** The diagnostic performance of the CCTA-AI group is comparable to that of senior physicians, and its application can, to a certain extent, promote the improvement of quality and efficiency of public hospitals. In the future, AI technology is expected to continue to be promoted and deepened in the medical field, optimize the overall layout of medical resources, improve the level of medical services, and continuously improve patient health. In the future, the analysis of the application value of AI technology at the system level should be further strengthened to comprehensively evaluate its actual contribution to the medical system.

abs-os335 Health Economic Evaluation of Artificial Intelligence-Assisted Diagnosis For Early-Stage Lung Cancer Screening

PRESENTER: **Yingpeng Qiu**
AUTHORS: Liwei Shi, Di Wu, Huanhuan Xu, Ms. Yue Xiao

Background: Lung cancer is one of the malignant tumors with the highest incidence and mortality in the world. With artificial intelligence (AI) technology widely applied in lung cancer, it has shown high applicability and can improve work efficiency and diagnostic accuracy. **Objective:** This study aims to evaluate the cost-effectiveness of artificial intelligence-assisted physician diagnosis in early lung cancer (stage I) screening from the perspective of the Chinese health system. **Methods:** A decision tree model was developed based on community population to simulate the cost-effectiveness of 10,000 patients for the diagnosis of pulmonary nodules by AI-assisted physician reading and physician reading, and calculating the incremental cost-effectiveness ratios, and evaluating the robustness of the model through one-way sensitivity and probabilistic sensitivity analysis, with the simulated end-point age of 78.6 years old. **Results:** In basic analysis, taking the number of early-stage lung cancer detections as the effectiveness indicator, the AI-assisted group discovered 40 more early-stage lung cancer cases than the physician group. The detection rate of early-stage lung cancer increased by 0.4%. Moreover, the AI-assisted group has a higher detection rate for lesions with diameters between 4-10mm. When using Quality-Adjusted Life Years (QALY) as the effectiveness indicator, the average cost per person in the AI-assisted group and the physician group were 1,483 RMB and 1,489 RMB respectively. The per capita effects of the AI-assisted group and the physician group are 17.02 QALYs and 16.99 QALYs respectively. Compared to the physician group, the AI-assisted group could save 6 RMB per case and gain 0.03 additional QALY per case, the ICER value was negative. The AI-assisted intervention was an absolute superior strategy. Threshold analysis showed that after the cost of AI-assisted physician reading screening was rose to 428 RMB, the ICER value was positive and below the willingness-to-pay range (893,598 RMB), which showed the AI-based intervention is economical. The results of the one-way sensitivity analysis and probabilistic sensitivity analysis showed that the model had good stability. **Conclusion:** Artificial intelligence-assisted diagnosis was cost-effectiveness in early lung cancer screening, and which can help "early detection, early diagnosis and early treatment" of lung cancer. Additionally, by controlling the costs of AI-assisted examinations appropriately and setting reasonable prices, the economic feasibility of AI medical technology can be further enhanced. **Key words:** decision tree model; artificial intelligence; lung cancer; cost-effectiveness analysis

os122 Bali International Convention Centre – Hibiscus

Costs and Utilisation in Mental Health Care: A Lifespan Perspective

MODERATOR: **Adrián Villaseñor**, University of York

abs-os174 Does Improving the Quality of Child and Adolescent Mental Health Services in the English NHS Have the Potential for Cost Savings?

PRESENTER: **Amy Barker**
AUTHORS: Jinyang Chen, Mr. Adrián Villaseñor, Rowena Jacobs, Maria Ana Matias

Background: Mental health conditions in children and young people (CYP) are high and rising. Consequently pressure has been placed on Child and Adolescent Mental Health Services (CAMHS) in England where referral rates almost doubled between 2017 and 2021. This trend is expected to have continued post covid-19 pandemic. Mental health conditions in CYP have both short- and long-term impacts on individuals' educational attainment, economic outcomes and overall health. In England, policies have prioritised care expansion and quality improvement for CAMHS services. However, little is known about the cost implications of quality improvement initiatives within CAMHS. **Objective:** We aim to address this knowledge gap by estimating the marginal cost of quality for a range of quality indicators including readmission rates, follow-up post discharge, waiting time for assessment and treatment, and clinician-reported outcome measures in CAMHS services. **Methods:** We use a large administrative data set covering all secondary mental health services for CYP (under 18) in England - the Mental Health Services Data Set (MHSDS) from 2016/17 to 2021/22. We calculate 10 generic quality measures some at either individual or trust level covering both inpatient and outpatient care. Total costs were calculated based on activity reported in the MHSDS using average unit costs at a hospital level from submissions to the National Cost Collection. We use a Generalised Linear Model (GLM), given the skewed nature of the dependent variable, total cost. The model adjusts for fixed effects including year, month and mental health provider, as well as patient demographics including age, sex, ethnicity, deprivation and case mix. Marginal cost is calculated at the patient mean. **Results:** The analysis includes over 2 million CYP. Preliminary results suggest small and often non-significant marginal costs associated with both urgent and non urgent waiting times to assessment and treatment and change in a Clinician Reported Outcome Measure (HONOSCA). However large positive marginal costs were seen for quality measures associated with inpatient treatment - readmission rates and post-discharge follow-up. This was most noted for reduction in potentially preventable readmission rates, possibly because the cost of inpatient care is high. **Conclusion:** This study suggests quality improvement initiatives in the outpatient setting can be associated with minimal cost changes and there may be cost savings if outpatient quality improvement initiatives generate reductions in inpatient bed days (either through reduced admissions or decreased inpatient length of stay).Our analysis points to areas where policymakers and providers might focus quality improvement efforts in CAMHS, especially in a resource constrained environment.

abs-os175 Excess Resource Use and Costs of Mental Health Problems in Swedish Children: A Longitudinal Register-Based Study

PRESENTER: **Ingyin Moe**
AUTHORS: Natalie Durbeej, Claire de Oliveira, Filipa Sampaio

Background

Mental health problems among children has become a major public health concern worldwide, warranting attention and action. If left untreated, mental health problems can persist into adulthood and lead to negative outcomes, including mental illness, school dropout, and unemployment. Yet, the economic burden of early childhood mental health problems in Sweden remains unquantified. This study examined the excess health care resource use and costs related to early mental health problems in preschool children.

Methods

This study uses data from a cohort of 6957 children aged 3–5 in Uppsala, Sweden. Early mental health problems were assessed using the Strengths and Difficulties Questionnaire (SDQ). These data were linked to longitudinal national register data on inpatient and specialized outpatient care from the National Patient Registry, primary care from Uppsala Region administrative database, as well as prescribed medication from the Prescribed Drug Register. Cumulative resource use and associated costs over a 4-year time horizon were estimated from a healthcare sector perspective, utilizing Diagnosis Related Groups, the Swedish cost per patient database and market prices, expressed as 2024 U.S. dollars (US$). Excess resource use and costs for children with early mental health problems were estimated compared to those without using Hurdle models for resource use and generalized linear models and two-part models for costs.

Results

Children with early mental health problems consumed approximately 3 units more prescribed medication and incur $299 more in medication costs than those without early mental health problems. Additionally, children had on average 1 more visits to specialized outpatient care at an additional cost of $622; and 5 more primary care visits at an additional cost of $376. No significant differences were found in inpatient care stays. Children with early mental health problems consumed overall significantly 9 more healthcare resources at an additional cost of $1457.

Conclusions

Children with early mental health problems incurred greater healthcare resource use and costs in terms of medication, primary care, and

specialized outpatient care compared to children without such problems. Our findings may inform healthcare planners and policy-makers of the economic impact of mental health problems among children in Sweden. Additionally, results may highlight the value of early identification of mental health problems, which in turn could facilitate delivery of appropriate treatment interventions.

abs-os177 The Economic Benefits of a Model of Pediatric Acute Mental Health and Addictions Care to Increase Value to Children, Youth, and the Healthcare System

PRESENTER: **Lola Ibraimova**, School of Public Health, University of Alberta
AUTHORS: Amanda Newton, Dat Tran, Arto Ohinmaa, Stephen Freedman, Jennifer Thull-Freedman, Bruce Wright

Background: Innovative solutions resulting in better outcomes, fewer healthcare resource use (HCRU) and lower costs for children and youth with mental health needs are integral components of an efficient healthcare system.

The objective of this study was to evaluate the cost benefit of implementing an acute mental healthcare bundle for improved mental healthcare delivery.

Methods: An observational cost analysis was conducted using data from two pediatric tertiary care emergency departments (EDs) in Alberta, Canada. Patients under 18 years with mental health issues were enrolled during a pre-implementation (standard care) and implementation (mental health bundle) periods. HCRU and associated costs were compared over 12 months following the initial ED visit.

Results: There were 686 pre-implementation (mean age 13.0 years) and 692 implementation (mean age 12.6 years) participants with no difference in terms of sex distribution ($p=0.04$). During the follow-up period, implementation participants were less likely to be admitted (4.6% vs. 9.8%; $p<0.001$) at the index ED visit and had fewer hospitalizations (mean=0.4 vs. 0.5; $p<0.001$), non-ED ambulatory care visits (mean=2.7 vs. 10.0; $p<0.001$), and practitioner claims (mean=34.3 vs. 46.8; $p=0.001$). ED visits were same for both cohorts (mean=1.5 vs. 1.5; $p=0.95$) during the follow-up period. Implementation participants incurred lower healthcare costs ($12,408 vs. $19,326; $p<0.001$) driven by lower hospitalization ($6,845 vs. $9,994; $p=0.01$), ambulatory care ($1,711 vs. $4,027; $p<0.001$), and practitioner ($3,851 vs. $5,306; $p<0.001$) expenses during the follow-up period. After risk adjustments, implementation participants had 40% (95%CI: 26%-52%) lower healthcare costs than pre-implementation participants ($p<0.001$).

Conclusions and Relevance: Participants who sought ED care after implementation of the bundle consumed fewer healthcare resources and had lower healthcare costs during the subsequent follow-up period (12 months). The integration of the bundle in tertiary care pediatric EDs is cost-saving to mental healthcare delivery.

abs-os195 The Marginal Cost of Mental Healthcare Quality for Adults in England

PRESENTER: **Mr. Adrián Villaseñor**, University of York
AUTHORS: Jinyang Chen, Rowena Jacobs, Maria Ana Matias, Adriana Castelli, Nils Gutacker, Amy Barker, Anne Mason, Maria Goddard

Background: Mental health services have been under pressure in England over recent years, with growing numbers of referrals, and large waiting lists. The government has sought to expand and improve NHS-funded mental health services, but providing quality mental healthcare at a reasonable cost is a challenge. For example, achieving quality improvements could be costly but they could also reduce costs in the long-run. There is currently a significant evidence gap in understanding the cost-quality relationship in mental healthcare and what areas policymakers might be best placed to focus quality improvements. **Objective:** This study addresses the evidence gap by estimating the marginal cost of healthcare quality for adults in England. **Methods:** We use data from the Mental Health Service Dataset (MHSDS), a large administrative dataset covering all secondary mental health services for adults in England for 2016/17-2021/22. We calculate several quality indicators at the individual (e.g. continuity of care, avoided readmissions, improvements in clinician reported outcome measures and mortality) and at the hospital level (e.g. waiting times, inappropriate out of area placement). To cost all care activity we use unit costs from the National Cost Collection and the Patient-Level Information and Costing Systems. Using a Generalised Linear Model (GLM) framework with fixed effects for time and provider, adjusting for outliers, and controlling for clinical, individual, and hospital level variables, we estimate the marginal costs of improving quality measures individually and jointly. **Results:** Our preliminary results are heterogeneous, depending on the quality indicator used, but we find predominantly negative marginal costs, suggesting that quality improvement efforts amongst mental healthcare providers might not necessarily be more costly. In keeping with previous research, we find large negative marginal costs for avoided readmission, suggesting that this is one of the most cost-effective quality indicators. There are also potential trade-offs and interactions amongst different quality indicators. **Conclusion:** To our knowledge, these are the first estimates of marginal costs for mental healthcare quality in England. Policymakers should consider the important nuances between the different quality measures for targeted quality improvement strategies in mental healthcare in the English NHS.

os151 Bali International Convention Centre – Magnolia

Theory Driven Economic Evaluation in Health and Social Care - a Disciplinary Turn or Bend in the Road?

MODERATOR: **Angela Bate**, Northumbria University

CONVENER: **Sonia Dalkin**, Northumbria University

DISCUSSANT: **Sam Redgate**, Northumbria University; **Andrew Briggs**, London School of Hygiene and Tropical Medicine; **Andrew Fletcher**, Northumbria University; **Hareth Al-Janabi**, University of Birmingham; **Sedighe Hosseini-Jebeli**, University of Birmingham; **Igor Shagalov**, London School of Economics and Political Science; **Stirling Bryan**, University of British Columbia

abs-os234 A Rationale for Theory Driven Economic Evaluation: Economic Evaluation in the Absence of Experimentation

PRESENTER: **Ms. Angela Bate**, Northumbria University

It is well documented that the most pressing challenges in health and social care require well-designed, often complex solutions. Interventions can be considered to be complex for several reasons including but not limited to: the number of components of the intervention (including people, skills, processes, organisations, and systems), the scale of the intervention (numbers of groups or settings), and the interaction and dynamic nature of these. Complexity also arises from external factors and the fact that the intervention exists in a complex world, including social, political and economic factors. Complexity thus has many implications for evaluation, not least, requiring methodological approaches and designs that embrace and account for complexity, identifying not just if an intervention works but understanding 'how', 'why', (in which circumstances, for whom?) interventions work and the implications for costs and outcomes. Impact evaluations using probabilistic/experimental methods have tended to dominate questions of effectiveness, controlling for processes and mechanisms and minimising biases to establish if there is causal effect from the intervention. Economic evaluations, often conducted as an extension of an impact evaluation have thus tended to be rooted in the experimental model in pursuit of establishing the relative cost-effectiveness of interventions. However, these methods cannot answer questions of how and why interventions work and often lack transferability in the real world. This represents a key limitation to providing applicable evidence for policy and service delivery, and highlights a methodological gap in the evaluation of complex interventions. Drawing on Tony Lawson's work alongside other ongoing and published examples of theory driven economic evaluation, this paper will explore economic evaluation in the absence of experimentation.

abs-os238 Is it Time to Rethink our Approach to Economic Evaluation Alongside Clinical Trials?

PRESENTER: **Mr. Andrew Briggs**
AUTHORS: Ms. Sam Redgate, Nicola McMeekin

In the field of evidence-based medicine, the randomised controlled trial (RCT) is widely considered at the top of the evidence hierarchy for its ability to estimate unbiased, causal effects of treatment on heath outcome. Yet the reliance on randomisation to infer causation only tells us whether treatment impacts outcome, it does not tell us 'how' such treatment effects are achieved.

In contrast to RCT-based analyses, health economic models describe how treatment impacts health outcomes, often mediated through surrogate outcomes. Using examples form previously published trial-based economic evaluations, the authors explore the potential for analysing clinical trials in such a way that the elucidates how treatment is impacting health outcomes, not just whether they impact health outcomes.

Developing an underlying conceptual/theoretical model that is then operationalised using the trial data can lead to a number of advantages for the interpretation of the results of such analyses, conditional on the underlying theoretical model being correctly specified. Such theory-driven analyses would aid our understanding of how treatments work and for whom such treatments are cost-effective. We compare such an approach for relatively 'simple' interventions (such as pharmaceuticals) with theory-driven models for more complex interventions. In particular, we ask the question of whether theory-driven economic evaluation necessarily needs to adopt a realist philosophy, and consider how doing so adds further benefits to the questions that economic evaluation can potentially answer.

abs-os243 The Application of Theory Driven Economic Evaluation in Practice 2: Process Tracing Methods in Economic Evaluation

PRESENTER: **Mr. Hareth Al-Janabi**, University of Birmingham
AUTHORS: Mr. Igor Shagalov, Ms. Sedighe Hosseini-Jebeli

Background: Economic evaluation generates evidence on the costs and benefits of health interventions, often in the form of a cost-effectiveness ratio. The idea is that a decision-maker can compare this to a threshold to determine whether the intervention is value-for-money (i.e. it will improve efficiency). This presupposes a decision-maker who uses evidence in a 'problem-solving' way to maximise health from a financial budget. It is questionable whether resource allocation works in this way in the real world and particularly outside in educational settings that are making investments in mental health and wellbeing.

Aim: To use process tracing methodology to (i) characterise resource allocation in school settings; (ii) identify where this deviates from the rational, problem-solving, model; and (iii) to generate insights for economic evaluation in these settings.

Methods: In the *Wellbeing Investment in School and Employers* (WISE) study, we used process tracing methodology to build and test theory to characterise decision-making. We used interviews and document analysis within a set of 9 case study schools and conducted an online survey to measure resource allocation practices with a wider set of schools (> n=100). The initial findings from these empirical studies have been synthesised into a set of eight features of resource allocation practice.

Results: The following features of resource allocation practice were all emphasised to varying degrees across UK schools: (i) diversity of decision-makers; (ii) conflicting objectives; (iii) workforce decisions; (iv) external search for resources; (v) contexts and constraints; (vi) practice wisdom; (vii) multiple sources of evidence; and (viii) varying evidence utilisation models.

Conclusion: The process tracing work generated important insights for economic evaluation. This includes paying close attention to (i) identifying decision-makers and their goals and constraints prior to analysis; (ii) engaging with different models of evidence use; and (iii) supporting schools with real world trade-offs around time use and external searches for resources. Process tracing may be a useful method for understanding resource allocation practices, and structuring economic evaluations, particularly in settings that are 'complex' or outside healthcare.

abs-os240 The Application of Theory Driven Economic Evaluation in Practice: Realist Methods in Economic Evaluation

PRESENTER: **Ms. Angela Bate**, Northumbria University
AUTHORS: Ms. Sonia Dalkin, Andrew Fletcher

The REEM study aims to improve evaluation by developing better ways to integrate realist and economic evaluation methods. Realist evaluation is distinct among other theory-driven approaches in that it uses a configurational approach to generative causation. Despite being amenable to using multiple methods and data types, realist evaluators rarely address economic considerations. Consequently, there are many detailed evaluations of complex interventions that open the explanatory 'black box' but do not indicate whether the intervention provides value for money.

Aims. This study therefore aims to develop *realist economic evaluation*; to determine if and how realist and economic evaluation approaches can be brought together, to produce an evaluative method that can determine what works, for whom, in which circumstances, why, and with what related resource impacts and opportunity costs.

Methods. An initial scoping review and expert stakeholder workshops were conducted to develop draft REE guidance. The guidance was then tested through three pilot evaluation studies, to a) evaluate whether REE was useful and b) further refine the guidance. Our RQs for this phase were therefore: 1) Is REE a feasible approach? And 2) what are significant challenges and enablers, or considerations required, which should be encompassed in the guidance?

One pilot evaluation, 'Waiting Well', focused on an NHS social prescribing intervention designed to enable 'prehabilitation' for people on surgical waiting lists. An estimated 70% of health outcomes are determined by social factors1 and social prescribing can be used to address multiple determinants of health. The core idea behind Waiting Well is that healthier patients will have better surgical outcomes and faster recovery times.

Initial programme theories were developed, based on patient pathways, then tested and refined using a combination of realist interviewing and a costing exercise, formulated around the realist 'context, mechanism, outcome' heuristic. The data were analysed and coded to identify causal configurations within the programme theories.

Results. Findings of the Waiting Well pilot evaluation are forthcoming in Q1 2025. We will present the refined programme theories and costs of different patient pathways though alternative models of prehabilitation, and how those work in different circumstances for different patient sub-groups.** We will also present briefly the inputs to the guidance refinement from the other two pilot evaluations in abstract terms.

Discussion. The three pilot evaluations have indicated: 1) REE is a feasible approach and 2) there are significant differences between REE and traditional EE approaches that require further elucidation through field testing and iterative refinement. Building on the UK Medical Research Council guidance and gradual acknowledgement of complexity in health economic evaluations, we see this as a way forward for HE to engage with the mechanisms of change. As such, EE findings will potentially become more useful to decision-makers, as they can consider the aspects of context essential for the desired outcomes and increase transferability of evidence.

os170 Bali International Convention Centre – Jakarta B

Making the Economic Case for Halving Premature Mortality by 2050: Insights From the Lancet Commission on Investing in Health

MODERATOR: **Stéphane Verguet**, Harvard University

CONVENER: **David Watkins**, University of Washington

abs-os349 Quantifying the Economic Value of Mortality Change and Full Income Change for 1990- 2019 and the COVID-19 Pandemic 2020-2023

The world has experienced large declines in mortality since 1990. However, commonly used economic welfare measures do not include these gains. This paper adds the value of changes in mortality risk to that of income growth to estimate recent changes in full income, 1990–2019 and during the COVID-19 pandemic (2020-2023).

We calculated the economic value of mortality change as a percentage of income at the start of each decade 1990–2023, for global regions and the 30 most populous countries. To estimate change in full income, we add age-weighted value of mortality change to the change in a conventional measure of income—gross national income (GNI). We also estimated the value of a one-year gain in life expectancy (VLY). Pandemic mortality was estimated using two approaches: 1) excess mortality and 2) P-score.

Globally, the value of mortality change was 18% of the global GNI at the start of the decade in 1990-2000, 23% in 2000-2010, and 14% in 2010-2019; or 55%, 50%, and 37% of the change in full income in the three decades, respectively. The VLY globally was 7%, 6%, and 6% of the starting income in the three decades, respectively. We observed wide variations across regions. Cumulatively, the value loss due to excess deaths during the COVID-19 pandemic were estimated at about 16-34% of the 2019 global income, with the largest loss in Central and Eastern Europe, Latin America, India, and the United States.

We conclude that mortality changes play a large role in the measurement of population well-being, accounting for almost half the gains in full income 1990–2019. However, most regions experienced major—although temporary—setbacks during the pandemic. Our estimates of the full income change suggest a more comprehensive view of changes in population well-being than either income change or mortality change alone. The estimates can also be used to advocate to finance ministries and legislatures for increased budget allocation to the health sector to support the “50 by 50” goal.

abs-os353 Modular Cost-Effectiveness Analysis: A Novel Approach to Priority-Setting for Health Benefits Package Design and Health System Development

Many countries are implementing reforms to support health system development, including revisions of health benefits packages (HBPs). However, conventional cost-effectiveness analysis (CEA) and health technology assessment methods have notable limitations when applied to maturing health systems. This paper describes a new approach to priority-setting called “modular cost-effectiveness analysis” that the Commission developed to address these limitations.

The starting point for modular CEA is to map all the interventions being considered for the HBP to local service delivery configurations and financing arrangements. Analysts then define a set of “modules” within which priority setting is done. Modules may be designed around delivery platforms (e.g., clinics, hospitals), disease areas (e.g., infectious diseases, cancer), or other dimensions relevant to implementation. Modular CEA entails two stages. First, health planners determine the available budget space for each module based on economic, strategic, and ethical (e.g., equity) considerations. Second, technical staff with expertise relevant to each module determine the optimal mix of interventions within each module given the budget constraint and module-specific objectives.

A key analytical dimension of modular CEA is its explicit handling of fixed costs and potential (dis)economies of scope within a given module. Leveraging modeling tools and approaches we developed previously, we present some worked examples to illustrate how modular CEA provides insights that are missed when conventional CEA is done on candidate interventions one by one. For example, the cost-effectiveness of various surgical procedures within a district hospital surgical program differs greatly depending on whether they are analyzed in isolation or in combination. As another example, treatment of high blood glucose in primary care is not cost-effective in isolation but is cost-effective when bundled with treatment of high blood pressure and cholesterol for the same high-risk populations. On the other hand, bundling mental health interventions with vascular disease prevention would not substantially change the cost-effectiveness of either set of interventions.

We also propose that analysts cost out realistic increments for expansion of each module, e.g., as an additional 10% population coverage over 10 years. Planners could then choose how much additional budget space to allocate to each module considering the overall health strategy. We did this exercise for a set of stylized modules based on the major health conditions that could help achieve “50 by 50.” For example, the cost of expanding a tuberculosis program by 10% would be 0.9 basis points of GDP in the average lower-middle-income country, whereas the same expansion of a basic mental health program would cost 3.6 basis points.

We conclude that modular CEA could be a useful adaptation of CEA to inform HBP design and health sector strategic planning. However, the idea is still in its infancy. Soon we plan to work with analysts in a few partner countries to test and validate the approach and iteratively refine the methods.

abs-os355 Health System Financing in Turbulent Times

The global landscape for health system financing is increasingly characterized by volatility, driven by compounding factors such as economic downturns, geopolitical instability, and the aftermath of the COVID-19 pandemic. This paper explores the shifting dynamics of health financing, focusing on how low- and middle-income countries can navigate this turbulence to achieve sustained health improvements.

How can health systems adapt their financing strategies amidst economic uncertainties to achieve "50 by 50" and improve health outcomes efficiently? We conduct a comprehensive review of recent global health expenditure trends and case studies of successful health financing reforms in low- and middle-income countries. Data sources include the World Bank, International Monetary Fund, and the World Health Organization's Global Health Expenditure Database.

Key results indicate a stark reversal in domestic health financing trends since the pandemic, with a decline in health's share of government budgets, particularly in lower-income countries. Despite temporary increases in health spending during Covid-19, many countries have reverted to pre-pandemic expenditure levels, jeopardizing progress towards universal health coverage and mortality reduction goals. To facilitate achievement of the 50 by 50 goal, most low- and lower-middle-income countries will need to allocate an additional 1-2% of GDP to government health expenditure on high-priority conditions and interventions.

The paper proposes a two-pronged approach to financing the "50 by 50" agenda. First, sustained domestic resource mobilization will need to involve cross-sectoral collaboration to enhance taxation capacity and increase the share of government revenue to health, as well as improve public financial management capacity. Second, action must be taken to improve the availability and affordability of essential medicines that address the 15 priority health conditions. The Commission proposes the "Arrow mechanism" as a pragmatic workaround to this problem. Named after the late Kenneth Arrow, who first proposed the idea for antimalarials, the Arrow mechanism involves (1) redirection of general budget transfers to ministries of health to line-item budget transfers for specific priority drugs, (2) centralized pooled procurement (by government or internationally), (3) procurement of large volumes to ensure availability, and (4) use and strengthening of both public and private supply chains.

The findings of this analysis underscore the need for renewed policy focus on health financing reforms tailored to the current economic context. The two recommendations from the commission could help mitigate the financial headwinds that governments face, make progress on "50 by 50," and improve health system resilience.

abs-os356 Achieving 50 by 50 through Strategic Financing: A Modular Political Economy Approach to Domestic Resource Mobilization

The Commission report calls for increased health financing amidst significant post-Covid-19 fiscal constraints, competing demands on government budgets, and economic headwinds. Mobilizing substantial new resources, primarily from domestic government revenues, is essential to fully implement the recommended interventions to achieve "50 by 50". This is especially true in especially for low- and lower-middle-income countries. Bearing in mind the Commission's recommendations for resource mobilization, policymakers must focus on creating conditions for the successful implementation of financing reforms. This study explores some proven political economy approaches in resource-constrained settings and frames them into health financing strategies that can respond to the resource mobilization recommendations in the Report.

This study employs a mixed-methods approach. The first component is a literature review of political economy analyses (PEA) in health financing reforms and fiscal strategies. Key sources include the WHO PEA guide and analyses on resource advocacy, investment case development, and health taxation frameworks. The second component examines public financial management (PFM) reforms, emphasizing fiscal decentralization. Data sources include World Bank, IMF, and country-level health financing data. Analytic techniques include stakeholder mapping, scenario modeling for health investments, and efficiency analysis to assess value for money. This approach contextualizes global strategies within local governance and fiscal realities.

Emerging findings suggest that coordinated financing strategies across national, subnational, and local governments are critical for achieving sustainable health investments in high-priority health conditions. Early analysis highlights the political complexities of implementing and earmarking new health taxes. It emphasizes the need for a careful implementation strategy to balance fiscal and budget feasibility of resource reallocations and public acceptance, especially in high-cost, non-essential treatments. Contextualized PFM reforms, particularly tailored line-item budgeting, are promising to improve the efficiency of priority drug procurement. Findings also underscore the importance of prioritizing health financing reforms that recognize fluctuations in external financing, complement existing efforts, and avoid "reform fatigue", overlaps, and excessive administrative burdens on health and fiscal authorities.

We conclude that unfavorable health financing trends demand a deeper understanding of constraints before mobilizing additional resources. Identifying effective reforms and generating policy recommendations is challenging, but implementation is just as complex and needs guidance and elements that ensure success. Insights from the literature and best practices highlight the need for context-specific strategies that address political, fiscal, and administrative barriers. Policymakers must prioritize not only what to reform but also how to create conditions for success, ensuring sustainable progress toward the "50 by 50" goal.

os191 Bali International Convention Centre – Nusa Dua

Health and Wellbeing Outcome Measure Valuation Methods for Children and Young People: Applications From Australia, New Zealand, Uganda and the UK

MODERATOR: **Joanna Coast**, University of Bristol

CONVENER: **Paul Mitchell**, University of Bristol

DISCUSSANT: **Giulia Greco**, London School of Hygiene and Tropical Medicine

abs-os442 Adolescents' Utility Values for the CHU9D tool in Uganda: Application of the Profile Case Best-Worst Scaling and Composite Time-Trade-off Methods

PRESENTER: **Rebecca Prah**
AUTHORS: Stephen Lagony, Ms. Giulia Greco, PhD, Donna Rowen, Helen A. Weiss, Aggrey Tumuhimbise, Fred Matovu, Jonathan Reuben Enomut, Levicatus Mugenyi, Prossy Namirembe

The Child Health Utility 9 Dimension (CHU9D) tool measures the quality of life of children and adolescents aged 7–19 years across 9 dimensions: worried, sad, pain, tired, annoyed, schoolwork/homework, sleep, daily routine, and activity participation with 5 response levels (1=best, 5=worst). It generates utility values for economic evaluations. Currently, values only exist for UK, China Netherlands and Australia. To estimate values for an African country is important as the health preferences of African children and adolescents may differ from other regions, potentially biasing economic evaluation results. The aim of this study was to generate CHU9D values among adolescents in Uganda.

I used profile case best-worse scaling (BWS-Case2) and composite Time Trade-Off (cTTO) methods. A total of 50 health states were selected with fractional factorial design from 1,953,125 states, blocked into five-choice task versions with 10 BWS tasks each. We randomly sampled 440 male and female adolescents from 12 secondary schools which were part of a cluster-randomized controlled trial (MENISCUS). Each participant was randomly assigned to a choice task version where they selected their best and worst attributes for each BWS task.

144 parents were purposively selected to complete the cTTO with 5 health states of varying impairment levels each. For health states 'better than dead', participants chose between living 10 years in the specific state versus fewer years (x) in full health. TTO score was calculated as x/10, with x adjusted until the participant was indifferent between the two choices. For health states 'worse than death' (WTD), a modified TTO approach was used: participant chose between immediate death and a period (x years) in the health state followed by 10 years in full health. TTO score was calculated as – (10 – x)/10.

For both cTTO and BWS exercises, participants completed the CHU9D and responded to questions about their overall health and quality of life.

BWS analysis is ongoing. Conditional Logit Model (CLM) is used to estimate preference weights. If preference heterogeneity is detected, I will fit a Latent Class Model (LCM) and compare both models using BIC and log-likelihood. If the LCM fits better, I will identify subgroups, generate class-specific weights, and compute their mean. With mapping, I will rescale the BWS values onto the TTO values to generate values from 0 (death) to 1 (full health).

BWS was completed by 438 adolescents with a mean age of 17 years (SD: 0.85). 74.2% were female, 91.7% understood the tasks well, and 75.2% found them easy or very easy. The cTTO tasks were completed by 127 parents, 74% were female, and the mean age was 41 years (SD: 7.5). The tasks were well understood with 14.96% finding them difficult to complete. The mean TTO values (generated with the parents) for the 5 CHU9D health states ranged from 0.16 to 0.45 (SD: 0.44). Results will be finalized in March 2025.

The study generates Ugandan-specific CHU9D values, capturing the preferences of African children and adolescents. Using these values will improve economic evaluation estimates, and result in better-informed resource allocation decisions.

abs-os461 Valuing the EQ-5D-Y-5L and EQ-5D-5L a New Zealand Adolescent Feasibility and Acceptability Study

PRESENTER: **Ms. Trudy Sullivan**, University of Otago
AUTHORS: Robin Turner, Paul Hansen, Franz Ombler, Emma Wyeth, Nancy Devlin, Sarah Derrett

Background:

There is increasing interest in understanding the acceptability and feasibility of asking adolescents to value health states, particularly for states 'worse than dead'. Research into methods for eliciting adolescents' preferences has mostly avoided asking adolescents to complete tasks to anchor values at dead=0 which is required for calculating quality-adjusted life years. The objectives of this study were to investigate the feasibility and acceptability to older adolescents of valuing health states including health states worse than dead using the EQ-5D-Y-5L (Y-5L) and EQ-5D-5L (5L), and to compare their preference weights for the Y-5L and 5L to gain an understanding of the transition between corresponding value sets.

Methods:

Two online surveys were created for the Y-5L and 5L, using the Potentially All Pairwise RanKings of all Possible Alternatives (PAPRIKA)

method, a type of adaptive discrete choice experiment (DCE), and a binary search algorithm to identify health states worse than dead. Convenience sampling was used to recruit 24 adolescents aged 16-19 years. Participants individually attended two think-aloud sessions about two weeks apart and completed the Y-5L or 5L respectively. At the end of each survey, participants were shown their ranking of the five EQ-5D dimensions and asked if the ranking was as they expected. The sessions concluded with a semi-structured interview. Paired t-tests were used to compare The rankings of dimensions were compared using paired t-tests and participants' Y-5L and 5L preferences weights were graphically compared using Bland-Altman plots. Participants' feedback was summarized.

Results:

Participants found the introductory video helpful, the survey easy to understand and could capably value health states, including those worse than dead. Though some participants found the DCE questions and binary search questions difficult to answer most participants (83% Y-5L; 79% 5L) said their ranking of dimensions was as they expected. Completing the survey in the presence of two researchers made them take the survey more seriously.

The overall ranking of dimensions was similar between the Y-5L and 5L with Feeling worried, sad or unhappy / Anxiety/Depression 1st, Pain/ Discomfort and Usual Activities 2nd or 3rd, Mobility 4th and Looking after myself/Self-Care, 5th. There was no evidence of a difference ($p>0.57$) in mean differences in preference weights (by dimension) between the Y-5L and 5L. The mean value for dead (i.e. before rescaling the preference weights so dead=0), the lowest health state value and the percentage of health states less than zero were 0.410, −0.796 and 17.8% respectively for the Y-5L and 0.417, −0.884 and 21.2% for the 5L.

Conclusion:

It is feasible and acceptable to elicit health state preferences of older adolescents including for health states worse than dead suggesting that adolescents' preferences can be used when creating value sets. Completing the survey in a supportive environment likely contributes to data quality. The differences in Y-5L and 5L preference weights were small indicating that the corresponding value sets could be similar.

abs-os489 Valuing the ICECAP-CYP:6-11 Capability Wellbeing Measure: a Best Worst Scaling Study in the UK

PRESENTER: **Mr. Paul Mitchell**, University of Bristol
AUTHORS: Samantha Husbands, Tim J. Peters, Sarah Byford, Philip Kinghorn, Paul Anand, Louise Proud, Joanna Coast, Isabella Floredin, Katie Breheny

Background

A new measure of capability wellbeing for children and young people (CYP) aged 6-11 years old has recently been developed. This measure is part of the ICECAP family of capability wellbeing measures, for use in the economic evaluation of health and care interventions. The ICECAP-CYP:6-11 has four levels for each of seven attributes: fun and play; learning and experiencing; attachment, stability and support; physical protection and security; achievement; freedom and having choices; well-becoming/aspiration. For the ICECAP-CYP:6-11 to be used in health and care economic evaluations, it is important that population values are attached to the attribute levels so that decision makers understand the relative importance of attributes and levels to the public.

Aim

To develop a UK population value set for the ICECAP-CYP:6-11.

Methods

An online panel company was used to recruit parents/guardians of 6-11 year olds in the UK. Parents/guardians were chosen to complete the valuation task due to limited evidence of validity on valuation methods in this age group. We undertook a best worst scaling (BWS) case 2 (profile) to generate population values for the ICECAP-CYP:6-11. Parents/guardians of 6-11 year olds completed 16 BWS tasks each, where they were asked to choose the best and worst part of varying attribute levels, thinking about their child as they made their choices. Parents/ guardians completed a proxy ICECAP-CYP:6-11 measure first to familiarise them with the seven ICECAP-CYP:6-11 attributes. Piloting suggested introducing a minimum time period to read the BWS instructions, complete a practice and the 16 BWS tasks. For participants to be included in the final analysis, they needed to complete the 16 BWS tasks in two minutes or more. They were also required to not report any errors that would violate a weak monotonicity rule (i.e. the desirability of an attribute) – this occurred when participants suggested the top level for an attribute was worst when a bottom level on another attribute was available in that task, and vice versa.

Study design included the completion of four blocks of 16 BWS tasks. Initial unadjusted analysis describes the best-worst pairs chosen most often in one of the four BWS blocks. Full analysis of the BWS data and estimation of the population valuation set will be completed and presented at the conference.

Results

Data were collected from 24 July-25 August 2023. From a potential pool of 5,992 parents/guardians, 2,645 completed the survey, with 711 of those completing the BWS tasks over the minimum time without errors. Best-worst pairs show that that *attachment, stability and support*, and *physical protection and security* were chosen as the top two attributes for best and worst, with the former top level being chosen as best most often and the latter bottom level being chosen as the worst most often.

Discussion

Initial evidence suggests that attachment, stability and support (written as “Being able to feel loved and have people who are there for me”) and physical protection and security (written as “Being able to stay safe from harm”) are the two most important capabilities on the ICECAP-CYP:6-11.

abs-os481 Valuing the Subjective Well-Being of Young People in Australia

PRESENTER: **Kaung Mon Winn**
AUTHORS: Mr. Gang Chen, Maame Esi Woode

Background:

The subjective well-being of young people can be effectively achieved by targeted policies and interventions that increase satisfaction in their specific life domains. Understanding the relative importance or weight of key life domains for adolescents enables policymakers to design targeted strategies that effectively enhance their subjective well-being, aligning policies with their unique needs and priorities.

Aim and Objective:

This study aims to elicit the utility weights and relative importance of key life domains for Australian young people from their own perspectives.

Methods:

An online survey was conducted in 2024, targeting Australian young people aged 15 to 19 years. A Discrete Choice Experiment (DCE) technique was employed to assess how young people perceive the importance of twelve key life domains, including physical health, mental health, family, friends, neighbourhood, life at school, choice, future, safety, time use, appearance, and things they have. Each domain was described using 4 levels. The DCE data was analysed taking into account potential preference heterogeneity using both latent class conditional logit and mixed logit models.

Findings:

A total of 799 Australian young people (53% female), with a mean age of 17 years (range: 15–19), completed an online DCE survey. All 12 domains were found to be statistically significant with varying importance. Based on the percentage of utility ranges within each domain relative to the total utility ranges across all domains, it is revealed that family, physical health, and mental health are the top three life domains for enhancing the subjective well-being of Australian adolescents, whilst neighbourhood, things you have and time use are three least important domains.

Conclusion:

The stated preference evidence from this study provides new knowledge on the relative importance of key life domains that matter the most for the subjective well-being of Australian young people.

11:00 AM –12:30 PM WEDNESDAY [Evaluation Of Policy, Programs And Health System Performance]

os193 Bali International Convention Centre – Medan

Establishing the Impact of Climate Change on Health Systems: Empirical Applications Across High- and Low-Income Countries

MODERATORS: **Nishant Jain**, ADB; **Manuela De Allegri**, University of Heidelberg

DISCUSSANT: **Josephine Borghi**, Department of Global Health and Development, London School of Hygiene and Tropical Medicine

abs-os495 Emergency Hospitalizations and Related Economic Burden of Heat Exposure: A Nationwide Time-Series Study in Germany

PRESENTER: **Hedi Katre Kriit**
AUTHORS: Alina Herrmann, Raeleesha Norris, Ms. Manuela De Allegri, Joacim Rocklöv

Background: Climate change increases the frequency and intensity of extreme heat events, which are associated with adverse health impacts. Europe is warming twice the rate of global average and in 2024 record number of days with strong heat stress was recorded. Europe’s population is especially vulnerable to heat events due to the large proportion elderly and people living in of urban areas. Heat effects on mortality has been widely studied, however, little is known about heat impacts on health care systems in terms of increases in emergency hospitalizations (EH) and their related economic costs in continental Europe.

Aim: This study aims to describe the relationship between daily mean temperature and EHs in Germany and to establish the risk among different demographic groups (age, gender) and for different disease diagnostic categories. Secondly, the study aims to estimate both the

number of EHs attributable to heat and the related economic costs from statuary health insurance perspective.

Methods: In this study an anonymized statuary health insurance data of 4.3 million individuals (approximately 5% of the total population) were linked with daily temperature data. We used distributed lag non-linear models with quasi-Poisson regression to estimate the risk of EH in relation to mean temperature during summer months of Maj to September in 2017-2022. Moreover, the number of EH and the costs attributable to heat was estimated.

Findings: We demonstrated an increased risk for EH with increasing temperature across Germany. We observed immediate risks increase among children ((6-17% (95% CI: 1-38%)) and the elderly ((3-11% (95% CI:1-17%)) in relation to extreme heat, and for adults ((2% (95% CI: 1-4%)) in relation to low and moderate heat. For diagnostic categories the highest increased risk for EH was observed for metabolic disease ((43% (95% CI: 30-60%)), followed by skin and subcutaneous tissue diseases ((13% (95% CI: 3-27%)), kidney and urinary tract diseases ((10% (95% CI:1-19%)), respiratory diseases ((7% (95% CI: 1-15%)) and injuries ((5% (95% CI: 1-8%)). We estimate 8.42% of the EH to be attributable to heat, corresponding to €35 millions for the study period.

Discussion: This is first nationwide study examining the relationship of summer ambient temperature and EH in Germany and quantifying the attributable economic burden to heat. If scaling the heat attributable economic burden to the total population, we estimate that 5-6% of the annual health expenditure was attributable to heat for this study period. Suggesting that increasing heat events already cause a substantial health economic burden, which has not been quantified before. This study provides valuable information for strengthening the health care system responsiveness for rapidly increasing number of heat events to guarantee high quality of care, but also essential for designing and evaluating the effectiveness of heat adaptation policies.

Conclusion: Our study demonstrates that heat increases the risk for EH. This calls for adequate preparedness planning in the health care sector, including effective adaptation policies to minimize the adverse health and economic effects of heat.

abs-os459 Extreme Heat and Mental Health: A Cross-Sectional Study Among Healthcare Workers in the Matam Health District, Senegal

PRESENTER: **Makhan Danfakha**
AUTHORS: Adama Faye, Valery Ridde, Jean Marc Goudet, Emmanuel Bonnet, Veronique Filippi

Background

Extreme temperatures (ET), exacerbated by climate change, represent a growing threat to global health. The Matam region, located in northeastern Senegal, is the most affected by ET in the country, experiencing increasing temperatures and frequency of extreme events. According to the Intergovernmental Panel on Climate Change (IPCC, 2021), these events are expected to intensify, significantly impacting population health, particularly mental health. Recent studies have demonstrated that prolonged exposure to heat can exacerbate pre-existing mental health disorders, increase psychiatric consultations, and heighten the risk of suicidal behaviors, including among healthcare workers who are on the frontline (Charlson et al., 2021; Lawrance et al., 2022; Thompson et al., 2023). As part of the EXTRAM Sen research project, we conducted a quantitative survey among healthcare workers in the Matam health district.

Objective

This study aimed to assess the impacts of extreme temperatures on the mental health of healthcare workers in the Matam health district, identify associated risk factors, and document the perceptions and strategies of healthcare professionals in response to these climatic conditions.

Materials and Methods

We conducted a cross-sectional descriptive study from October 20 to 27, 2024, involving a sample of 218 public and private healthcare workers operating in 45 service delivery points within the Matam health district. A digital questionnaire, adapted from the HIGH Horizons survey on the impact of heat on workers' health, was designed using Kobotoolbox. It incorporated internationally validated psychometric tools: WHO-5 (mental well-being), PSS-4 (perceived stress), GAD-7 (generalized anxiety), PHQ-9 (depression), Mini-International Neuropsychiatric Interview (psychiatric disorders), Maslach Burnout Inventory (professional burnout), and PSQI (sleep quality).

Data analysis is ongoing to examine associations between extreme temperatures, observed psychological symptoms, mental health impacts, and coping strategies.

Preliminary Results

Out of the 250 targeted participants, 218 healthcare workers responded, achieving a response rate of 87%. Data were collected from 45 out of the 47 service delivery points in the district. Regarding respondent characteristics, 66.5% were women, and the average age was 35.6 years. The most represented professional categories included community health workers (18.35%), nurses (17.89%), midwives (14.22%), nursing assistants (12.84%), and physicians (6.42%).

Preliminary analyses reveal significant impacts of ET on the mental health of healthcare workers. Two cases of suicidal risk were identified during data collection and received immediate medical care. The collected data will be analyzed considering temperature variations recorded on the days of the survey.

Conclusions

Mental well-being of healthcare workers is essential for a well-functioning health system. Our study will provide insight into the magnitude of the problem, orienting possible solutions to tackle this emerging health system challenge through concerned action at system level.

abs-os444 Health and Economic Assessment of Extreme Temperature and Late Preterm Births in Germany - A Space-Time-Stratified Case-crossover Study

PRESENTER: **Hannah Lintener**
AUTHORS: Raeleesha Norris, Ms. Manuela De Allegri, Falko Sniehotta, Hedi Katre Kriit

Background: With climate change, the intensity and frequency of heat events is increasing. Pregnant women have been shown to be particularly vulnerable to extreme heat exposure. Literature suggests increased risk for PTB due to extreme heat, even in temperate climates.

Study aim: In this study, we aimed to assess the association between extreme heat days and PTB using a nationally representative sample of statutory health insurance (SHI) data in Germany and estimate the heat-attributable economic burden of PTB from the SHI perspective.

Methods: We applied a retrospective, time-space-stratified case-crossover study design using R Studio. PTB hospital cases were extracted from the InGef database, a nationally representative sample of anonymized SHI data and matched with mean daily temperatures on federal state level from the ERA-5 dataset by the European Centre for Medium-Range Weather Forecasts. We calculated relative risks (RR) using distributed lag non-linear models (DLNM) using a quasi-Poisson regression during 2017-2022 from March to September. The economic burden was estimated by multiplying the attributable number (AN) of heat-associated PTB with the additional mean direct hospitalization costs associated with PTB (inflation-adjusted).

Results: The association between temperature and PTB suggests an increasing risk for PTB with increasing temperature, displaying a U-shaped curve. We estimate an increased risk of 1.32 (95% CI 0.84-2.07), 1.19 (95% CI 0.89-1.60) and 1.13 (95% CI 0.92-1.40) for PTB outcomes in relation to the 99^{th}, (26°C), 95^{th} (23°C) and 90^{th} percentile (21°C), respectively. The AN of PTB in relation to temperatures between reference and maximum temperature (15°C-29°C) is estimated to be 144 cases (95% CI 0-347). With an average additional cost of PTB of € 18,915 (19,917 USD) per case, the economic burden of PTB attributable to heat in the sample is estimated to 2,718,895 € (2,862,996 USD).

Conclusion: The findings suggest that heat may potentially be associated with an increased risk of PTB as well as a substantial economic burden of up to 2,718,895 € due to PTB associated with daily mean temperatures between 15°C-29°C. However, the actual societal costs of heat-associated PTB are underestimated as only a subsample of the SHI population and direct hospitalization costs was considered with no inpatient, long-term, indirect or intangible costs accounted for in this analysis. Future studies need to explore effects further; however, findings already suggest a need for heat adaptation measures targeted at pregnant women to reduce the health and economic burden of heat.

abs-os478 The Effect of Extreme Weather Events on The Utilisation of Routine Maternal and Child Health Services in Zambia

PRESENTER: **Chris Mweemba**
AUTHORS: Moses Chisola, Cherie Part, Dell Saulnier, Josephine Borghi, Chitalu Chama Chiliba

Background: Extreme weather events, such as floods and heatwaves, are becoming more frequent due to climate change, and present substantial risks to health systems from shifting demand patterns and service disruptions. These risks are especially high in resource poor settings, with potential to hinder routine health services, such as for maternal and child health (MCH) care, with implications for health outcomes. Although evidence is growing of the effects of floods and heatwaves on MCH, there has been less attention to service utilization effects, yet maintaining healthcare access could reduce adverse health effects.

Aim: This study examines the effect of floods and heatwaves on utilization of four routine maternal and child health services (antenatal care, institutional delivery, postnatal care, and childhood immunization) using secondary data in Zambia.

Methods: We use monthly district-level service utilization data (visit/delivery counts) from Zambia's District Health Information System (DHIS) 2 for 2014-2022, alongside data on district socio-economic status, health sector funding, population density, and health worker and facility density.

Flood exposure is assessed through three district-level measures, taking the highest monthly value: (1) share of land with floodwater, (2) share of human settlements with floodwater, and (3) share of facility catchment areas with floodwater. Floods are mapped by comparing satellite data with water reference maps using NASA's MODIS Near-Real Time Global Flood Product and the Global Surface Water database. Heatwave exposure was assessed using ERA5-Land re-analysis data from the Copernicus Climate Data Store, aggregated to district level. Monthly heatwave exposure was defined by three or more consecutive days above the 90th, 95th, and 99th percentiles of daily maximum temperature, calculated for the three hottest months (1990-2019 reference). Monthly counts of heatwaves and 'hot days' (above the 90th, 95th, and 99th percentiles of daily max temperature) were also considered. Absolute temperature values (continuous) were converted to percentiles by district and month to assess impacts of relative exposure.

To examine the relationship between flood exposure and service utilization, we compare quasi-Poisson regression with distributed lag nonlinear models (DLNM) to capture delayed effects, with fixed-effects panel regression with month and district fixed effects. Heterogeneity in exposure effects is examined by urban/rural districts, socio-economic status (above/below median), and health facility/worker and population density.

Key results: We present the relationship between flood and heatwave exposure and utilization of MCH services across districts in Zambia,

comparing the findings from the different regression models, and identify temperature and flood intensity thresholds above which services are impacted. We also show differential effects across provinces and by subgroups.

Conclusions: It is important to examine the impacts of weather extremes on routine services and drivers of vulnerability to understand the need for and targeting of adaptation measures to ensure continued Universal Health Coverage progress. Our presentation will conclude by reflecting on the opportunities and challenges in using routine data to monitor climate impacts on MCH care.

11:00 AM –12:30 PM WEDNESDAY [Evaluation Of Policy, Programs And Health System Performance]

os228 Bali International Convention Centre – Surabaya

Building Efficient and Equitable Health Systems in Asia: Insights from Regional Collaboration for HTA

MODERATOR: **Saudamini Dabak**, Health Intervention Technology Assessment Program (HITAP) Foundation

DISCUSSANT: **Yot Teerawattananon**, Health Intervention and Technology Assessment Program Foundation (HITAP); **Wendy Babidge**, ASERNIP-S, Royal Australasian College of Surgeons

abs-os656 Development of a Health Technology Assessment (HTA) Registry for Asia

PRESENTER: **Ryan Jonathan Sitanggang**

Background: The volume of Health Technology Assessments (HTAs) in Asia is steadily increasing, providing valuable evidence for healthcare decision-making. However, access to this growing body of research remains fragmented, with limited sharing practices and minimal representation in global repositories. To address this gap, HTAsiaLink is developing a regionally maintained HTA registry to centralise information on planned, ongoing, and completed HTAs across Asia. This initiative aims to enhance collaboration among HTAsiaLink members, reduce research duplication, accelerate policy decisions, and support regional harmonisation efforts, such as standardising clinical reporting in the Association of Southeast Nations (ASEAN). **Objective:** The aim of this study is to review experiences of existing registries and learn from member perspectives about the requirements of the registry to facilitate data sharing among HTAsiaLink members, strengthen evidence-informed decision-making and advance the integration of HTA ecosystems across the region. **Methods:** A review of existing HTA registries to identify best practices and challenges. Repositories such as Tufts Cost-effectiveness Analysis (CEA) Registry, INAHTA, and ClinicalTrials.gov were analysed for features, strengths, and limitations. In parallel, in-depth interviews with HTAsiaLink Board members from Singapore, the Philippines, Indonesia, and Malaysia provided insights on registry design, user engagement, sensitive data considerations, and usability features. A survey distributed to the HTAsiaLink Council members to further refine priorities, ensuring the registry aligns with stakeholder needs. The HTAsiaLink Board was consulted on the design and development of the registry. **Results:** Preliminary results indicate strong stakeholder support for the initiative, emphasising its potential to streamline processes and improve collaboration. Feedback from the global review highlighted the need for clear inclusion standards and intuitive interfaces. Stakeholders prioritised transparency, usability, and regional relevance, all of which are guiding the registry's prototype development. The registry will track HTAs from planning to completion, offer multilingual accessibility, provide user-friendly search functionalities, and ensure robust data security. It will integrate into the HTAsiaLink website for accessibility and serve as a centralised platform to reduce inefficiencies and enhance the dissemination of HTA evidence across Asia. Final consultations with stakeholders will be used to refine the registry’s design and functionality to ensure it meets regional needs effectively. Long-term sustainability is emphasised through a management plan that accommodates potential transitions in HTAsiaLink’s institutional arrangements. **Conclusion:** By centralising HTA efforts, the registry will enhance regional collaboration, improve access to evidence, and support timely and informed policy decisions. It will also contribute to on-going efforts to harmonise HTA in the region. This initiative aligns with HTAsiaLink’s mission to drive innovation and efficiency in HTA activities in Asia.

abs-os636 Navigating the Health Technology Assessment (HTA) Guideline Development: a Special Task Force Between HTAsiaLink, HTAi, and ISPOR

PRESENTER: **Kinanti Khansa Chavarina**

Background: Health technology assessment (HTA) is increasingly being adopted as a multidisciplinary, systematic, and participatory tool for priority setting and to inform decision-making. In many countries, HTA has been used to support health policy decisions regarding health services and technologies for the population and promote efficient resource allocation. Alongside political will, strong governance, data infrastructure, and capacity building, national HTA guidelines have been identified as a key factor in establishing a well-functioning HTA system. More countries are developing their national guidelines, including those that are relatively in a nascent stage of HTA development, such as low- and middle-income countries (LMICs) that have limited resources and context constraints. Although there are several international organisations that offer support in developing HTA guidelines, there are limited resources and literature that could provide an overview to develop HTA guidelines. **Objectives:** This special task force aimed to provide a report of good practices and practical recommendations for developing or updating HTA guidelines to facilitate the guideline development process and ensure successful implementation. **Methods:** The Task Force, established in 2022, brought together experts and academics from diverse regions worldwide, each with extensive experience in developing HTA guidelines for national health policymaking. A mixed-methods approach was used to develop good practices and context-dependent recommendations. This approach included a literature review and key-informant interviews. The synthesised recommendations were validated through stakeholder consultations, open peer reviews, and expert feedback. Additionally, a series of teleconferences among Task Force members were held to iteratively refine the report. **Results:** This report presented a set of resources and context-appropriate practices for developing or updating HTA guidelines. The recommendations outlined six key aspects throughout the guideline development cycle. These

included (i) setting objectives, scope, and principles of the guideline, (ii) building the team for a quality guideline, (iii) defining the stakeholder engagement plan, (iv) developing content and utilising available resources, (v) putting in place appropriate institutional arrangements, and (vi) monitoring and evaluating guideline success. **Conclusion:** Across all contexts, the recommendations emphasised transparency, building trust among stakeholders, and promoting a culture of ongoing learning and improvement. The report advocated for aligning the development and revision of guidelines with the evolving HTA landscape and the pace of HTA institutionalisation. As HTA continues to be used to inform diverse decision-making processes across various country contexts, it will be important to monitor lessons learned to ensure the recommendations remain relevant, practical, and effective.

abs-os642 Strategic Priorities and Goals for HTAsiaLink

PRESENTER: **Lapad Pongcharoenyong**

Background: HTAsiaLink is a regional collaboration in HTA and health systems policy research, recognized for its strong relationships and collaborative approach among its over 50 organisational members from across 20 countries. As the network grows, maintaining focus on HTA development becomes increasingly challenging, particularly given the diverse income levels of its member countries. A strategic plan will guide HTAsiaLink's expansion, address the needs of non-member countries, and build capacity across varying HTA systems. This plan will outline goals, objectives, and strategies for advancing HTA research, capacity building, and policy engagement across the region. **Objective**: The objective of this initiative is to develop a strategic plan for the HTAsiaLink network, aiming to understand the landscape and strategic plans of other networks on HTA and the needs of members in the region for building capacity for and institutionalising HTA. **Methods:** The "Individual, Node, Network and Environment" or INNE framework for capacity building was used as a conceptual framework for the study. A targeted review was conducted on HTA and health system strategic plans for networks. A survey was conducted with members to understand their needs and expectations from the networks with six sections: (1) Organisational Profile, (2) Current Engagement with HTAsiaLink, (3) Role of HTAsiaLink, (4) Organisational Priorities, (5) Network Management, and (6) Additional Inputs. Based on the survey data, Key Informant Interviews (KII) with selected members was conducted. Data was synthesised and summarised thematically. **Results:** The review of strategic plans from nine organisations highlights common themes in health and policy environments, by focusing on HTA as a core objective. Common goals include capacity building, evidence-based decision-making, and long-term objectives like strengthening public health systems. Stakeholder engagement through surveys and expert reviews is central to all plans. Strategic priorities center on capacity building, enhancing organizational value, and long-term impact. Communication strategies, including publications, workshops, and online platforms, align with HTAsiaLink's practices. Regular monitoring and impact assessments are used to track progress. Challenges identified include financial constraints, diverse stakeholder needs, and dynamic policy environments. Based on these results, key areas and indicators were identified for consultation with members. **Conclusion:** The development of HTAsiaLink's strategic plan will be instrumental in guiding the network's growth and addressing the diverse needs of its members across the Asia-Pacific region. By reviewing strategic plans of key organisations along with insights from HTAsiaLink members will help shape the roadmap that aligns with regional HTA capacities and promotes collaboration. Over the next 5-10 years, the strategic plan will help HTAsiaLink advance HTA research, support policy development, and build capacity, while addressing challenges such as financial constraints and stakeholder diversity. This approach will strengthen HTAsiaLink's role in supporting health systems and improving health outcomes across Asia.

11:00 AM –12:30 PM WEDNESDAY [Supply And Regulation Of Health Services And Products]

os43 Bali International Convention Centre – Bali

Licensed and Unlicensed Workers in Residential and Community-Based Long-Term Care

MODERATOR: **Bianca Frogner**, University of Washington Center for Health Workforce Studies

CONVENER: **Joanne Spetz**, University of California, San Francisco

DISCUSSANT: **Alicia Plemmons**, West Virginia University; **Jack Needleman**, University of California, Los Angeles, Fielding School of Public Health; **Fangli Geng**, Brown University

abs-os163 Services, Regulations, Training, and Staffing in U.S. Residential Care Facilities

PRESENTER: **Joanne Spetz**, University of California San Francisco
AUTHORS: Lela Chu, Timothy Bates

Background and Aims: Residential care communities (RCCs), which are also known as assisted living facilities and residential care facilities for the elderly, provide long-term services and supports in a residential setting. They provide care to both older and younger adults who need assistance due to disability or cognitive impairment. In 2016, it was estimated that more than 800,000 people lived in nearly 29,000 RCCs in the United States, and spending on residential care has been projected to nearly double between 2015 and 2030. The U.S. Bureau of Labor Statistics estimated that facilities that provide care for the elderly, which includes both RCCs and nursing homes, employed 888,500 workers in 2021, and employment will surpass 1.03 million workers by 2031. Home care aides and nursing assistants accounted for more than 380,000 of these jobs. This study will provide detailed information about staffing in RCCs using a nationally-representative survey, exploring relationships between residential care facilities' resident characteristics, services offered, state regulations of RCCs, and staffing.

Methods: The principal data source for this study will be the RCC component of the National Post-Acute and Long-Term Care Study (NPALS). The 2020 dataset had 4,312 respondents, and a weighted response rate of 45%. We are finalizing access to the restricted-use microdata for 2020 and 2022, which are needed to access state identifiers and all variables required for this study. We will use both descriptive statistics and

multivariate regression to examine staffing patterns of residential care facilities in general, and how they vary by facility size, ownership type (chain, for-profit vs non-profit), resident demographics (age, race/ethnicity), and geographic location (Census region, rural vs. urban). We also will examine training required of and offered to unlicensed aides and how this varies by facility and geographic characteristics. Finally, we will assess whether state staffing regulations for RCCs are associated with different staffing patterns, holding other facility and resident characteristics constant.

Key Results: We are finalizing data on regulations of RCCs for all 50 states. Prior research has documented that home care aides and nursing assistants accounted for more than 380,000 of jobs in RCCs. Average staff hours per resident day are higher in RCCs with more than 75% of their residents diagnosed with dementia compared with RCCs with small percentages of residents with dementia. An analysis of 2014 data found that staffing of licensed nurses was higher in RCCs located in states that required a licensed nurse be available or on staff; 38 states had such a requirement at that time.

Conclusions and Implications for Policy and Practice: This study will provide valuable information to regulatory agencies, training programs, and RCCs themselves about staffing patterns and training received in RCCs, including whether there are differences in these characteristics that are associated with the degree to which these communities include people living with Alzheimer's disease and related dementias and with state policies and regulations.

abs-os162 The Prevalence of Multiple Job Holdings Among Regulated and Unregulated Care Workers in Ontario and British Columbia Nursing Homes

PRESENTER: **Ms. Amy T. Hsu**

Background: In Canada, the demand for long-term care (LTC) services is anticipated to increase ten-fold by 2038. The provision of direct care to LTC residents falls primarily on unregulated workers, such as personal support workers (PSWs) or care aides. Despite their essential work, PSWs face limited job security, with many working multiple jobs or more than full-time to earn a living wage. Given the increasingly challenging work environment, understanding multiple job holdings among unregulated LTC workers is necessary.

Approach: This study examines sociodemographic, employment, and self-reported psychosocial and health characteristics of single and multiple job holders among both regulated and unregulated care workers in Canadian LTC homes in Ontario and British Columbia (BC). We used survey data collected as part of a prospective cohort study between March 2021 and November 2022. The study population consisted of regulated and unregulated care workers in Ontario and BC LTC homes, including nurses, PSWs, food service workers, rehabilitation assistants, and recreation assistants. Job holding was defined as the number of jobs held prior to pandemic single-site restriction policies were enacted in each province.

Results: A total 417 regulated and 701 unregulated care workers from 27 Ontario and 12 BC LTC homes were included in our study. Overall, our sample consisted predominantly of PSWs, women, individuals who held a certificate or diploma, and/or worked in urban homes with 100 or more beds. In terms of job holding, 885 workers (79.2%) held a single job, while 233 (20.8%) held two or more jobs. Almost 50% of multiple job holders were of Asian descent and nearly 70% were immigrants to Canada, while approximately 50% of single job holders were white and 55% were immigrants to Canada. We found a higher percentage of multiple job holders (38.9%) reported being quite a bit or extremely stressed at work compared with single job holders (27.6%).

Conclusion: We observed a high prevalence of multiple job holding within the LTC sectors in Ontario and BC. Our findings aim to inform LTC workforce planning and supports required given the aging population and growing workforce. Future research is needed to better understand the drivers and impacts of multiple job holding.

abs-os165 Workplace Absences in the Homecare Sector: Applying Time-to-event Regression Analysis to Model Personal Support Worker Unplanned Absences

PRESENTER: **Katherine A.P. Zagrodney**, University of Toronto

Background: Unplanned healthcare worker absences are a global challenge, affecting those seeking care, fellow employees through added responsibility and coverage, employers, and the healthcare system. Healthcare workers, and particularly personal support workers (PSWs), are more likely to experience absences than other occupations. In many countries, PSWs provide the majority of paid homecare, thus their high unplanned absence rates are particularly impactful to homecare delivery. Existing quantitative literature focuses on sickness absences pre-pandemic, while qualitative studies capture PSW experiences during the pandemic. Applying quantitative models to better understand contemporary factors influencing homecare PSW absences is important for the design of evidence-informed labour supply policies.

Objectives: To examine the frequency of homecare PSWs' unplanned absences and to determine the relative effects of demographic, workplace, and contextual factors on the likelihood of a PSW having an unplanned absence in a given week.

Data: The open cohort design utilized weekly longitudinal administrative data for approximately 2,000 PSWs providing over five million hours of publicly funded homecare services within a homecare organization in Ontario, Canada from January 2019 to June 2024.

Analysis: Descriptive statistics were applied to describe changes in absences trends over time. Cox proportional hazard models (time-to-event regressions) across stratified periods (pre-, early-, mid-, late- and post-pandemic) were used to model unplanned absences for homecare PSWs, controlling for individual baseline heterogeneity. Predictor variables captured the relative effects of demographic, workplace, and contextual factors on the hazard of an individual PSW experiencing an unplanned absence in a given week.

Results: Unplanned absence rates spiked early-pandemic before returning to relatively stable pre-pandemic rates. In Ontario, school closures

were prevalent throughout pandemic periods and were significantly correlated with unplanned absences. While late- and post-pandemic findings are forthcoming, stratified models for pre-, early-, and mid-pandemic periods found that PSWs with higher income, shorter travel distance, and older age, were the least likely to have an unplanned absence across multiple periods. Specifically, higher income significantly reduced the hazard of an unplanned absence by 10.2-16.4% (pre: HR 0.836; 95% CI [0.786, 0.889; early: HR 0.898; 95% CI [0.824, 0.980]; mid: HR 0.879; 95% CI [0.803, 0.961]). PSWs who travelled further distances the previous week had higher odds of an unplanned absences in pre- and mid-pandemic periods (HR 1.166; 95% CI [1.092, 1.246]; HR 1.252; 95% CI [1.139, 1.377], respectively).

Conclusion: Understanding homecare PSW unplanned absences will be increasingly relevant for health workforce planning in the context of limited labour supply and rising needs from an aging population. Based on time-to-event stratified regression models, key predictors of unplanned absences were lower income and further travel distances. Additionally, school closures had a significant effect on absences for this highly gendered workforce which highlights the impact of disruptions in the broader care economy on this vital component of the healthcare workforce. As the need for homecare PSW services continues to expand, it will be increasingly important to design data-informed policies that can improve workforce stability and continuity of care.

12:30 PM –1:30 PM WEDNESDAY [Social Events]

Bali International Convention Centre

Lunch - Exhibition Gallery (Level 2) only

1:30 PM –3:00 PM WEDNESDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Bali

Payments, Pricing and Price Transparency

MODERATOR: **Bruno Ventelou**, CNRS - Aix Marseille University

Ind-408 Alternative Pricing Policies for Multi-Indication Products: A Quantitative Analysis

PRESENTER: **Carlos Rojas Roque**

ABSTRACT

Background. Various pricing models have been proposed for multi-indication drugs, including uniform pricing across all indications and indication-based pricing (IBP). While existing studies have examined the effects of these pricing models on access, quality-adjusted life years (QALYs), and healthcare costs, few have assessed their overall impact on population health. Moreover, most studies overlook elements such as launch timing, post-patent value, and the influence on innovation. A thorough evaluation of IBP is increasingly relevant, as several countries are adopting IBP policies, and spending on multi-indication drugs is rising, especially with new products like immunotherapies demonstrating efficacy across diverse cancer types.

Objectives. To assess the population health impact of three pharmaceutical pricing policies for multi-indication drugs: uniform pricing, IBP, and a hybrid model called commercial flexibility.

Methods. We develop a quantitative framework to compare how these pricing policies affect drug access, health benefits, innovation, and pharmaceutical costs over a product's lifecycle. The outcome of the analysis is the net health effects, encompassing both the health benefits derived from the utilisation of a new drug and the health opportunity costs linked to the extra expenses required for its funding. To reflect current policies in the UK, uniform pricing and IBP are implemented with an approval norm (γ) of £30,000/QALY for all indications, and £20,000/QALY for indications requiring commercial flexibility. The framework is illustrated with numeric examples and two case studies (nivolumab and pembrolizumab) relevant to the UK, yet the framework and qualitative findings have broad application across health care systems.

Results. Implementing IBP reduces overall population health by 521-5,719 QALYs (range across product value profiles, with and without innovation effects) compared to uniform pricing. Commercial flexibility results in lower population health than uniform pricing (0-229 fewer QALYs) when innovation effects are not considered, but somewhat higher outcomes (0-1,795 more QALYs) when innovation effects are included. For IBP to improve health outcomes in the UK, where pricing decisions are not expected to substantively influence pharmaceutical R&D decisions, it would require a γ of £20,000/QALY or below. For commercial flexibility to be beneficial, it would require a γ of £15,000/QALY or below for indications where commercial flexibility applies. Introducing nivolumab under IBP is projected to result in a population health loss of 69,747 QALYs, higher than the 17,333 QALYs lost under uniform pricing. Pembrolizumab's introduction under IBP is expected to a loss of 102,467 QALYs, compared to 19,603 QALYs lost under uniform pricing. Thus, introducing IBP at current γ would approximately double expenditure for those products without improving access to medicines. An approach that seeks to maximise long-term population health, balancing innovation incentives with the opportunity costs of higher pharmaceutical expenditure for these products, would involve IBP with a γ of approximately £10,000/QALY.

Conclusions. IBP and commercial flexibility can improve access to new drugs but must be carefully designed to avoid cost increases that could harm overall population health. Lower cost-effectiveness thresholds are required for these policies to contribute positively to population health.

Ind-1935 How Does the Spanish National Health System Set Price of Non-Industrial Advanced Therapy Medicinal Products?

PRESENTER: **Zuzana Spacirova**
AUTHORS: Juan Carlos Rejón-Parrilla, Jaime Espín

Background: Chimeric antigen receptor (CAR) T cell therapies (CAR-T therapies) are a type of advanced therapy medicinal products (ATMPs) that belong to the family of personalized cancer immunotherapies. They are indicated for patients with relapsed or refractory haematological malignancies (i.e. B-cell acute lymphoblastic leukaemia, diffuse large B-cell lymphoma, Mantle cell lymphoma and multiple myeloma). Long-term follow-up data indicate prolonged remission rates and improved survival. They can be produced by pharmaceutical companies, but the majority of ATMPs originates from research performed in specialized academic facilities, through public support or the support of non-for-profit funds; the development and manufacture is at small scale, not for commercial purposes and at a national level only. This last route for development has been enabled by the so-called 'hospital exemption' (HE), which is a clause that was added to the European ATMP regulation EC1394/2007 (Article 28), to allow manufacturing of ATMPs outside the standard centralized marketing authorization. In Spain, there are five ATMPs produced under HE up to now, but only one of them (CAR-T ARI-0001 developed by *Hospital Clìnic* in Barcelona) is financed by the Spanish National Health System (NHS). However, it is unclear what resources (cost elements) required for its manufacturing were considered when setting price; this price (89,270€) is one third of price of commercial CAR-Ts financed by the Spanish NHS (i.e., 320,000-360,000€).

The objective is to describe the landscape around the pricing and reimbursement of ATMPs that are developed by academic and non-profit developers, to understand the pricing dynamics that apply to this family of products.

Methodology: First, we did targeted reviews of selected literature based on our knowledge of the field and targeted ad-hoc searches of relevant sources to inform this work, including peer-reviewed literature and grey literature (including reports and articles by specialist or mainstream news-outlets). Second, we designed a semi-structured questionnaire that has been sent to the manufacturers of non-industrial ATMPs in Spain.

Results: The Spanish Ministry of Health has elaborated a guideline on what cost elements required for manufacturing of academic ATMPs should be considered in price setting. The answers to the questionnaire will reveal if this guideline had to be completed by the ARI-0001 manufacturer in price & reimbursement process. In the Netherlands, the researchers have developed a guideline to calculate price of ATMPs from the manufacturer point of view. Both guidelines exclude the cost of amortization of the building and the cost of the alternative use of land, building and other assets the belong to the hospital. Additionally, the Dutch guideline excludes the cost of failure.

Conclusions and implications: We have identified differences in guidelines to be used in price setting of academic ATMPs across the European countries. Greater methodological harmonization across Europe is needed. Additionally, if academic ATMPs are allowed to compete with commercial ATMPs with prices calculated as they are now, this could result in unfair competition.

Ind-1381 Intermediaries Under the Spotlight: Transparency of Pharmacy Benefit Managers and Drug Spending

PRESENTER: **Nicola Maria Fiore**
AUTHORS: Ms. Oriana Ciani, Joseph Ross, Simone Ghislandi

Background: In the US, prescription drug prices are negotiated between pharmaceutical companies, pharmacy benefit managers (PBMs), and plan sponsors, resulting in complex and often opaque pricing structures. PBMs negotiate drug prices with manufacturers on behalf of plan sponsors, and may profit by charging plan sponsors more than they reimburse pharmacies (a practice known as "spread pricing"). Since 2018, amid heightened scrutiny over rising prescription drug costs, several states have implemented laws banning PBM spread pricing in an attempt to reduce drug costs for patients. We study how banning specific contracting practices in the drug supply chain can reduce drug costs for consumers, specifically examining premiums, deductibles, list prices, and cost-sharing paid by beneficiaries.

Objectives: Regulators argue that banning spread pricing will better align what plan sponsors pay with what pharmacies receive, reducing hidden PBM profits and ultimately lowering patient costs. We investigate whether these bans effectively reduce total and out-of-pocket costs for consumers.

Methods: We use the staggered adoption of state-level PBM spread pricing bans to study their impact on Medicare Part D drug plans. Comprehensive plan–drug–county data are obtained from the "Quarterly Prescription Drug Plan Formulary, Pharmacy Network, and Pricing Information" dataset, covering 2016 to 2024. The unit of observation is at the plan–county–drug–year level. For each plan, we collect data on premiums, deductibles, drug prices, and cost-sharing for DPP-4 inhibitor drugs (ATC A10BH). We compute total and out-of-pocket costs and analyze whether spread pricing bans decrease drug spending for beneficiaries. Our staggered difference-in-differences design accounts for potential heterogeneity across plan types and affiliations.

Results: Spread pricing bans lead to significant reductions in the total cost of DPP-4 drugs, primarily through lower patient cost-sharing, rather than changes in premiums or list prices. The effects are strongest for branded drugs and for plans unaffiliated with PBMs, where PBM profit margins were likely highest before the bans.

Discussion: Our results suggest that targeted contracting regulation in the drug supply chain can lower prescription drug costs, especially for patients using high-margin branded drugs and in plans without PBM affiliations. We contribute to policy discussions on pharmaceutical pricing by providing new evidence on the effectiveness of state-level spread pricing bans and highlight the importance of considering contracting structures in regulatory design.

Ind-1724 Price Transparency in Hong Kong s Private Healthcare Services: Usage and Usability of Price Information Among Private Healthcare Facilities Users

PRESENTER: **Ho Man Shum**, Centre for Health Systems & Policy Research, Jockey Club School of Public Health and Primary Care, Chinese University of Hong Kong
AUTHORS: Chi Tim Hung, April Yushan WU, Chiu Ha Kong, Wai Ling Cheung, Ho Kwan Yam, Eng-kiong Yeoh, Eliza Lai Yi Wong

Background: Price transparency initiatives for healthcare services have been implemented in health systems with large private sectors to reduce costs by encouraging consumers to select cheaper providers. A prevalent strategy involves publicizing prices for "shoppable" healthcare services, which, however, have shown limited effectiveness. Low utilization of price information by patients and poor usability are often cited as reasons, but evaluation of price information usability from a consumers' perceptions is lacking. Since 2021, private hospitals and day procedure centers in Hong Kong have been required to publicize prices for major chargeable items. Evaluation of these initiatives is needed. **Objectives**: This study aims to evaluate the usage and usability of published price information, including fee schedules and bundled pricing, from patients' perspective. It also seeks to identify factors associated with the usability of price information and to explore patients' barriers in utilizing price information. **Methods**: This is a cross-sectional survey followed by in-depth interviews conducted in Hong Kong from October 2023 to April 2024, targeting local residents aged 18 or older who had undergone at least one common non-emergency procedure in private healthcare facilities. The survey included questions about the usage of published price information, reasons for not using, experience and perceived usability of price information. We assessed perceived usability through an average score derived from 14 statements based on the validated System Usability Scale. Descriptive statistics were summarized, and multivariate linear regression was applied to identify factors associated with perceived usability. Semi-structured qualitative interviews were conducted by inviting survey participants as a supplementary approach to better understand patients' experience when utilizing price information. **Results**: From the 500 respondents in the survey, there were 215 (43.0%) who referred to price information for their most recent non-emergency operation/procedure. Among non-users, 180 (63.2%) had no intention to seek price information, primarily due to trust for their doctors (67.2%) and having adequate affordability or insurance coverage (54.4%). Among users, the overall perceived usability of price information was satisfactory, with mean score of 3.90 out of 5. Statements with highest and lowest ratings were future use of price information (Mean= 4.27, SD= 0.66) and easiness to compare price (Mean= 3.59, SD= 0.94) respectively. Multivariate analysis indicated that respondents who utilized bundled pricing information was the only factor significantly associated with higher perceived usability. In the qualitative part, 30 interviews were conducted and three major barriers of using price information were identified: insufficient comprehensiveness; low understandability; and difficulties in estimating total price. **Conclusions**: This study is the first to assess users' perceived usability of published price information. While the utilization rate was not high, they significantly exceeded those reported in US studies, likely due to lower insurance coverage in local context. Overall, the usability of price information was considered satisfactory, but with significant room for improvement. Bundled pricing information could be a preferrable solution. Further study is warranted on the effectiveness of price information locally.

Ind-1080 Health Insurance Payment for Telehealth Services: Scoping Review and Narrative Synthesis

PRESENTER: **Qingqing Li**
AUTHOR: Junfang Xu

Background: As the telehealth services have demonstrated significant advantages in the providing of qualified and accessible care, health insurance payment for telehealth services have been issued by various countries. However, the optimization of health insurance payments for telehealth services remains uncertain. Therefore, we conducted a systematic review of the current situation regarding health insurance payments for telehealth services, with the aim of providing evidence to enhance policies related to health insurance payments for such services. **Methods:** This systematic review was conducted by comprehensively retrieving date from six electronic bibliographic databases from inception until October 2023. The databases included China National Knowledge Infrastructure (CNKI), Wan Fang, Weipu Database (VIP), Web of Science, PubMed, and Embase, following the PRISMA guidelines. Two authors independently assessed search results, extracted data, and evaluated the quality of the included studies. After the initial screening of titles and abstracts, full texts were obtained and examined. The following data were extracted and analyzed: first author, date of publication, country, type of telehealth services introduced in health insurance, health insurance reimbursement providers, reimbursement standards for telehealth (e.g., the condition for the reimbursement and reimbursement rate), and key findings of studies. Moreover, we also conducted a narrative synthesis to summarize and report the findings. **Results:** A total of 7232 articles were retrieved. Following quality assessment, 23 articles were finally included, with the covered countries including China, the United States, Australia, France, Japan, UK, and Germany. The forms of the services vary across different regions, mainly including online consultation services, online medical monitoring services, online mental health services, online health education services, online surgical guidance services and other services. Payment standards are generally categorized into fee-for-service and global budget payment, with clear health insurance payment quotas or proportions and certain restrictions (e.g., specifying the location of medical visits, setting the limitation on distance from home to hospitals or setting a prerequisite for reimbursement is the referral of primary doctors). The paying entities for health insurance payment include national health insurance and commercial health insurance. In addition, there are two kinds of reimbursement rates: a comparable rate for both telehealth and in-person healthcare services, and a lower rate for telehealth services compared to in-person healthcare services. **Conclusions:** To enhance the accessibility of telehealth services through health insurance payment, it is crucial to further refine the design of health insurance payment for telehealth and strengthen the supervision of services quality, bridging the gap between telehealth and in-person healthcare services.

Bali International Convention Centre – Magnolia

Analysis of Health Expenditure

MODERATOR: **Pratik Khanal**,

Ind-2091 Ship in a Storm? Public Debt, Health and Other Social Spending in Developing Countries.

PRESENTER: **Charles Birungi**
AUTHORS: Jaime Atienza Azcona, Lazarus Muchabaiwa, Benard Musekese Wabukala, Ramathan Ggoobi, Michael A. Obst, Melissa Sobers

Background

Social spending is in a crisis. In developing countries, there are troubling trends. This is in part due to a growing public debt deluge. Governments in developing countries are increasingly turning to public debt to navigate the persistent financing challenges. Scholarly debate on the linkage between public debt and social spending such as on health is inconclusive. This paper tests the displacement effect of debt servicing on government spending away from education, health, and HIV spending.

Data and methods

The study uses publicly-accessible panel data for 26 Low-Income Countries (LICs) and 51 Lower Middle-Income Countries (LMICs) for the period 2010 – 2022. Based the "displacement effect" hypothesis, the analysis employs the Driscoll-Kraay (DK) standard errors approach to panel data estimation to test whether debt servicing obligations constrain government budgets and shift spending away from social sectors.

Results

The impact of public debt on social spending varies depending on the country's income level. A 1% increase in total debt is associated with 1.3% increase in education spending, while debt servicing shows no significant impact in LICs. In contrast, both total debt and debt servicing negatively affect education expenditure in LMICs. Specifically, a 1% increase in debt servicing is associated with a 0.04% decrease in education spending in LMICs. Additionally, results show that debt servicing has a negative effect on current government expenditure on health in LICs. A 1% increase in debt servicing results in approximately 0.7% reduction in current expenditure on health by the governments in LICs. However, the effect on total debt stock on health spending is insignificant. For the LMICs, total debt stock and debt service are associated with 1.2% and 0.3% increase in health expenditure respectively. Finally, on HIV spending, results show a positive relationship between public debt and spending on HIV for both LICs and LMICs. A 1% increase in debt service is associated with 0.6% and 0.2% increase in HIV expenditure for LICs and LMICs respectively.

Conclusions

Whereas public debt can be a benefit and not a burden, overall, debt servicing displaces much-needed investments in education and health in developing countries. However, this study highlights the complex and varied relationship between public debt and social spending across different economic contexts. Regarding global social spending policies, the findings suggest a need to recognise public debt servicing is a critical barrier to social spending and the modalities of debt servicing should thus be re-oriented to minimize the negative impacts of debt on social sector outcomes. By extension, treating the debt deluge has potential to expand fiscal space for social sectors and move the world towards achieving the social sector-related Global Goals by 2030. Increase in HIV spending associated with increased debt servicing could, in part, be due to strong advocacy for increased domestic resource mobilization given the current heavy donor dependence for financing national HIV responses. Building on and strengthening systems that are working for the HIV response, there is need to strengthen advocacy for increased social spending as well as rethinking and restructuring current and future debt.

Ind-1560 South Korea's Healthcare Expenditure Across Health Conditions, Demographics, and Payer Types (2011-2020)

PRESENTER: **Katelyn J Yoo**
AUTHORS: David Bishai, Bryan Patenaude, Yoonkyung Lee, Tae-jin Lee, Sooyeol Park, Junghoe Kim, Yerin Cha

Background South Korea has witnessed a rapid increase in health expenditure, reaching USD 135 billion in 2021 and accounting for 9.3% of its GDP, surpassing the OECD average. Despite achieving universal health coverage, significant gaps remain in service coverage, leading to high out-of-pocket (OOP) expenses that expose households to financial burdens.

Methods This study examines healthcare spending in South Korea from 2011 to 2020 using national datasets, focusing on expenditures across two primary payer categories: public insurance and OOP payments. Data were stratified by health condition, age group, sex, type of care, and income level. A combination of the National Health Insurance (NHI) dataset and the Korea Health Panel Survey (KHPS) was used to estimate total health expenditures, with multiple imputation methods applied to address data gaps.

Findings Healthcare expenditure in South Korea rose significantly from $45.6 billion in 2011 to $76.9 billion in 2020, placing an increasing economic burden on the system. Public health insurance spending grew at an annual rate of 5.1%, while OOP expenses rose by 5.0% for covered services and 6.7% for uncovered services. Despite a shift toward greater public funding—with public expenditure comprising 64.4% of total spending in 2020—OOP payments still accounted for 35.6%, remaining above the OECD average. Individuals aged 60 and above contributed to 51.3% of total expenditures. Gender disparities emerged, especially in high-cost areas like obstetrics and gynecology, where

women incurred higher OOP costs. Additionally, uncovered services experienced significant spending growth across all income levels, with major cost contributors including musculoskeletal disorders, urinary tract disorders, and chronic diseases such as hypertension and diabetes.

Interpretation This study highlights the need for targeted healthcare policies in South Korea to address rising costs and persistent inequalities. High OOP expenses disproportionately impact vulnerable groups, especially women and the elderly, while uncovered medical costs are growing across income levels, straining households. Conditions like musculoskeletal disorders, hypertension, and diabetes, along with gender-specific costs such as obstetric care, emphasize access inequities. Uncovered OOP expenses are rising faster than covered services, particularly among older adults. Addressing these issues requires policies to ease financial burdens and ensure equitable healthcare access.

Ind-707 Sources of Regional Variation in Healthcare Expenditure in Japan: Evidence from Movers

PRESENTER: **Sayaka Nakamura**
AUTHORS: Haruko Noguchi, Shiko Maruyama

Significant regional variation in healthcare utilization is observed across many countries, and understanding its drivers has important policy implications. A seminal study by Finkelstein, Gentzkow, and Williams (2016) (henceforth FGW) exploit patient migration to decompose regional variation in healthcare utilization into differences in patients' characteristics and differences in place effects. The former represents the demand-side component, and the latter reflects the supply-side component, such as the market structure and providers' characteristics, as well as geographic factors. They conclude that the major source of regional variation in the U.S. is differences in place effects rather than patient effects. Conversely, several studies applying FGW's methodology to data from European countries find that regional variation in healthcare utilization is primarily driven by differences in patients, which might be attributable to universal health insurance and stronger government-controls over prices in Europe. However, previous findings are mixed even among European countries, which might suggest the role of other aspects of the health care system.

This study investigates the sources of regional variation in healthcare expenditure in Japan using administrative insurance claims data from 2015 to 2022, obtained from a large insurer that provides mandatory health insurance to employees of small and medium-sized enterprises and their families, covering about one-third of the Japanese population. Japanese data offers valuable insights into how the share of place-specific factors varies in the context of differing institutional frameworks across countries and differing market structures across service areas. Japan shares a universal health insurance system and government-controlled prices for healthcare services with previously studied European countries, but direct government control over health care providers appears weaker in Japan, with little standardization of care, lack of monitoring, absence of strong incentive schemes for cost containment, and geographic maldistribution of physicians. We compare across different service categories; medical care, dental care, and prescription drugs to study how the results vary with market characteristics of the service category, exploiting scarcity of physicians in non-urban areas and overall abundance of dentists.

Following FGW, we exploit migration to decompose regional variation in Japanese healthcare expenditure into patient factors and place-specific factors. We build on FGW's methodology by using the raw healthcare expenditure as the outcome variable, rather than conventional log-transformed expenditure with an added constant, using demography-adjusted means, and studying migration across Secondary Medical Areas and across prefectures (Tertiary Medical Areas).

Our analysis finds that regional variation in total healthcare expenditure is primarily driven by demand-side factors. When we analyze expenditure by service category, we observe the same pattern for medical expenditures. However, for dental and prescription expenditures, about a half of prefectural variation is explained by place effects, which might suggest excessive care provision due to surplus of dentists and prefectural variation in prescription and supply of generic drugs. Additionally, correlation between place effects and patient effects is positive for dental expenditure, consistent with sorting of physicians and patients and with previous findings, but negative for total expenditure, medical expenditure, and prescription drug expenditure.

Ind-1405 Variation in Healthcare Expenditure across Health Institutions: The Role of Physician

PRESENTER: **Shiko Maruyama**, University of Technology Sydney
AUTHORS: Jiahui Guo, Hang Zou

Background: Geographic variation in healthcare expenditures and its drivers are well-documented. To understand the source of regional variations in healthcare, researchers have explored the drivers of geographic variation by applying the mover design. However, few studies have investigated another large variation and its drivers: expenditure variation across health institutions. Even fewer studies have explored the drivers of such variation in developing countries. Our study fills this gap by applying the mover design to isolate the role of physicians in driving expenditure variation across health institutions. Physicians, who make critical decisions in testing, prescription drugs, and overall treatment plans, exhibit substantial variation in practice styles and beliefs about effective treatments. Additionally, physicians may respond strategically to financial incentives. Quantifying the contribution of physician factors provides important policy implications for policymakers who hope to curb the increase in healthcare costs by reducing medically unjustified variations. **Objectives:** Using administrative data of outpatient and inpatient services from 2007-2017 in Sichuan Province, China, we first examine variation across Chinese health institutions. We then investigate the role of physicians in explaining the variation in expenditure across health institutions. **Methods:** To separately identify the relative contribution of the physician factor from other determinants of expenditure (eg. patient factor), we employ the mover design, which allows us to separate the contribution of physician factors from the overall variation by exploiting physicians' move across healthcare institutions. Specifically, we use two empirical approaches: a fixed-effects model to decompose expenditures and calculate component shares, and an event-study analysis to visualize the dynamics of physician contributions in the years surrounding a move. Additionally, we use LASSO and k-means methods to select variables and categorize institutions into groups, exploring physician contributions within these categories. **Results:** First, we document a large variation across Chinese health institutions with a growing variation in inpatient expenditures, particularly after 2010, whereas outpatient expenditure variations remain relatively stable over the years. Second, our event study analysis reveals that expenditure in physicians' changes rapidly when and after physician move to other institutions, with little pre-trend before physicians move.

Moreover, by decomposing the expenditure, our fixed effect model infers that the physician factor accounts for 5 percent and 20 percent of the difference in expenditure between above- and below-median health institutions for outpatient and inpatient, respectively. Finally, when categorizing institutions into different groups and analyzing the movers within the groups, we observe a larger physician role in explaining expenditure differences, particularly in smaller institutions. **Conclusion and Implications:** We find that physician factors explain only 5 percent of the variation in outpatient expenditure but 20 percent in inpatient expenditure. These findings suggest that policies regulating physicians' behavior have limited effectiveness in alleviating the burden of healthcare costs in China overall, especially for outpatient services. Furthermore, greater focus should be placed on regulating smaller institutions. **Keywords:** Expenditure variation, Health institution, Physician, Mover design, China

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1:30 PM –3:00 PM WEDNESDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Jasmine

Cost-Sharing, Insurance Design, and Patient Behavior

MODERATOR: **Karen Eggleston**,

Ind-120 Patient Responses to Declines in Cost-Sharing: Telehealth and High-Deductible Health Plans

PRESENTER: **Risha Gidwani**
AUTHORS: Steven Asch, Lane Burgette, Aaron Kofner, Veronica Yank, Zachary Wagner

A majority of privately-insured Americans are enrolled in high-deductible health plans (HDHPs), which are characterized by 100% cost sharing for most services until a high deductible is met. A host of evidence indicates that as patient cost-sharing increases, patients reduce their use of both high-value and low-value health care. This may be especially problematic for the 60% of Americans that are chronically ill and require regular access to medical care to manage their diseases. Using quasi-experimental techniques, we study what happens to care utilization when patient cost-sharing *decreases* and whether patients are responsive to selective declines in cost-sharing, in a national cohort of 1.4 million chronically-ill adults. Using difference-in-differences and event study models, we evaluate the effect of a 2020 policy change to $0 cost sharing for telehealth services, and how utilization changed differently for HDHP enrollees compared to nonHDHP enrollees. Due to this policy shock, HDHP enrollees experienced substantial declines in cost-sharing for telehealth, while nonHDHP enrollees experienced small declines in cost-sharing. Entropy balancing weights were used to address confounding from time-varying factors that might have changed differently between HDHDP and nonHDHP groups. Our outcomes included the following: 1) use of any outpatient care; 2) use of $0 telehealth; and 3) use of $0 telehealth as a proportion of outpatient care. To test whether any differences were due to preferences for care modality versus cost-sharing, we further evaluated: 4) use of non-$0 telehealth. Difference-in-differences results indicate no difference in change in overall outpatient visits between groups ($p = 0.84$). However, HDHP enrollees increased their use of $0 telehealth by 0.08 visits more over an 8-month period than did nonHDHP enrollees ($p < 0.001$) and shifted more of their care to $0 telehealth ($b= 0.01$, $p < 0.001$) following the policy change. HDHP enrollees also had lower uptake of non-$0 telehealth compared to nonHDHP enrollees (($b= -0.01$, $p = 0.04$). Event study models allowing for monthly changes in behavior across different disease states revealed similar results. Results show that HDHP enrollees with chronic conditions responded to a sudden decrease in (selective) cost-sharing for telehealth by increasing their use of such services more so than enrollees in non-HDHPs. That HDHP enrollees had lower use of telehealth services that retained cost-sharing provides support for the argument that the causal mechanism for their relative increase in $0 telehealth utilization was due to the larger decline in cost-sharing rather than a stronger preference for the telehealth modality. This is the first study to rely on a policy shock – the shift to $0 telehealth – to evaluate the effects of HDHPs on consumer behavior. Our results indicate that patients respond in economically rational – and selective – ways to changes in cost-sharing. Our findings have implications for the Consolidated Appropriations Act of 2023, which allows HDHPs to offer first-dollar coverage for telehealth for 2023 and 2024, and indicate that extending such legislation beyond 2024 can help ensure receipt of outpatient care for chronically-ill patients.

Ind-1553 The Effect of Cost-Sharing on Medical Care Demand: Insights from Novel Real-World Data for the Oldest-Old in Japan

PRESENTER: **Rong Fu**
AUTHORS: Haruko Noguchi, Akira Kawamura, Masato Oikawa

Objective: This study evaluates the impact of Japan's Ministry of Health, Labour and Welfare increasing cost sharing for medical care services from 10% to 20% for those aged 75 and older with a specified income in October 2022. This primary focus is on assessing effects on medical care utilization and out-of-pocket expenses among the oldest-old adults.

Methods: Using a regression discontinuity design with an event study (RDD-event study), this study focuses on single-person households near a 2 million JPY income cutoff. The treatment group, just above the cutoff, experiences a cost-sharing increase, while the control group, below the cutoff, maintains a 10% cost sharing. Income, with a 0.5 million JPY bandwidth, serves as the running variable. Data from the National Database of Health Insurance Claims linked to taxable income records (n=19,264,480 as of January 2023) provide a monthly longitudinal dataset from November 2021 to March 2023.

Results: The RDD-event study includes around 1.37 million individuals, averaging 82 years old with an annual income of 4 million JPY. One month before the cost-sharing increase, total medical care expenditure rises by 4%, decreases by 6% in October 2022, remaining negative and statistically significant from November 2022 onwards (3-4% range). Similar trends are observed in medical care utilization, with a smaller and insignificant impact on utilization rate three months after the cost-sharing increased. Notably, 16 diseases exhibit negative and statistically

significant impacts post-increase, ranging from approximately -17% for dental caries and -3.6% for diabetes. Six months later, impacts decrease by 20% for 10 diseases (e.g., hypertensive, asthma), stay consistent for 2 diseases (cataract and Musculoskeletal disorders), and become statistically insignificant for 4 diseases (e.g., diabetes, Alzheimer's).

Discussion: Findings suggest a "last-minute surge in demand" before the cost-sharing increase, causing to an initial spike in medical care expenditures. Post-increase, individuals markedly reduce costs, linked to prior medical care service utilization. Oldest-old individuals tend to reduce service quantity (intensive margin) rather than abstain completely (extensive margin). On average, simulated out-of-pocket expenses surge by 95%, with around 85% experiencing nearly twofold increases during the observational periods. The study indicates sustained access to medical care services, even with increased cost-sharing for elderly incomes above a specific threshold. But, elasticity varies significantly by disease, emphasizing the need for comprehensive considerations beyond income, including the health status of the oldest-old adults when contemplating adjustments.

Ind-2633 The Impact of Pharmaceutical Copayment Reduction on Healthcare Use and Out-of-Pocket Costs in Australia

PRESENTER: **Thomas Plunkett**

Background: Within Australia, medications have been subsidised under the Pharmaceutical Benefits Scheme (PBS) for over 75 years, with the copayment amount increasing each year in line with inflation. Amidst cost of living pressures, in January 2023 the Australian government reduced the prescription medication patient copayment from $42.50 to $30 (approximately a 30% decrease) for general patients, but not for concessional patients (welfare recipients, low-income patients, and pensioners). Exploiting the framework of a natural experiment, we analyse the impact of this policy on out-of-pocket expenditure (OOPE) and healthcare use.

Methods: We analyse the impact on a 10% random sample of adults (18 years and older) from a whole-of-population pharmaceutical (PBS), out-of-hospital healthcare use, and Census-linked administrative dataset for all Australians, for the years 2021 to 2024. Using a matched sample of concessional patients (who did not experience a copayment change) as a control group, we implement a difference-in-differences approach to investigate the average OOPE savings experienced by patients, as well as the impact on out-of-hospital healthcare usage, such as general practitioner and specialist visits.

Results: Preliminary analyses suggest a modest OOPE saving experienced by the average Australian general patient, with minimal impacts on additional healthcare usage. Additional analyses suggest that the policy impacts were small as the majority of medications are already priced below the general copayment levels.

Conclusion: Given the current state of increased cost-of-living pressures worldwide, Government policies offering relief to a crucial expenditure such as medications is seemingly a welcome initiative. However, our results suggest that this policy is insufficient to address OOPE towards prescription medicines. Given the majority of prescription medicines are already below the general copayment, future iterations of the policy should consider further reductions to the copayment and employ better targeting to benefit patients. Moreover, as this Australian policy affects all general patients (i.e., those from higher socioeconomic classes as well), this renews the discussion around inequalities in OOPE within Australia and whether more targeted policies for those most in need should be implemented instead.

Ind-119 High-Deductible Health Plans and Receipt of Guideline-Concordant Care for Chronically-Ill Persons

PRESENTER: **Risha Gidwani**

AUTHORS: Alex Peltz, Steven Asch, Lane Burgette, Zachary Wagner, Aaron Kofner, Veronica Yank

Importance: High-deductible health plans (HDHPs) are a highly-common insurance mechanism in the United States, enrolling 57% of privately-insured persons. We evaluate whether HDHPs meet the medical needs of chronically-ill people, who require regular access to health care. More than 50% of Americans have one or more chronic illness. **Data and Cohort:** We study a longitudinal cohort of chronically-ill adults aged 18-64 in the 2016-2018 MarketScan data. MarketScan contains administrative and claims data from approximately 350 payers nationwide. Cohort members had asthma, diabetes, hypertension, coronary artery disease, heart failure, or major depressive disorder. **Outcome Measures:** Use of annual recommended medical care, which was abstracted from disease-specific evidence-based clinical practice guidelines and consisted of: 1) clinic visits; 2) lab tests; 3) prescription drugs; and 4) a composite measure evaluating all three. Results were pooled across disease type to improve the policy relevance of findings; disease-specific analyses were also conducted. **Methods:** Our identification strategy leveraged multiple quasi-experimental approaches: difference-in-differences models combined with instrumental variables and entropy balancing weights. The treatment group consisted of persons forced to enroll in a HDHP; the control group consisted of persons in nonHDHPs. Forced new enrollment in a HDHP was instrumented by employment in a full-replacement firm (an employer that only offered HDHPs). Entropy balancing was used to address any residual confounding. We also conducted triple-difference models to assess any sex-based disparities, using the same identification strategy. **Results:** We followed 537,092 adults over 3 years. Groups exhibited covariate balance after entropy balancing. In this multiply-morbid cohort, forced enrollment into a HDHP reduced use of recommended medical care, with persons in HDHPs reducing their use of recommended clinic visits by 2.1 percentage points (95% CI -3.3 to -0.1), $p < 0.001$), their use of recommended annual labs by 3.5 percentage points (95% CI -5.0 to -2.0, $p < 0.001$), and their use of recommended prescription drugs by 12.0 percentage points (95% CI -14.1 to -9.8, $p < 0.001$). Overall, HDHP enrollees were 3.4 percentage points less likely to recommended medical care compared to nonHDHP enrollees (95% CI -4.4 to -0.26 percentage points, $p < 0.001$). The direction of effect was consistent across disease types. Results from triple-difference models females forced to enroll into HDHPs had a greater reduction in use of recommended clinical care compared with males forced to enroll into HDHPs ($p = 0.021$). **Conclusions and Relevance:** HDHPs do not support receipt of recommended medical care, across a variety of chronic conditions. HDHPs may be particularly problematic for females, who experience income and wealth disparities that may leave the same cost-sharing more burdensome for females than for males. Our results have important implications for recently-proposed U.S. federal legislation that proposes to exempt chronic illness management from HDHP deductibles.

Ind-2656 Investigating Behavioural Changes in Response to Medication Copayment Reductions Across Different Therapeutic Groups in Australia

PRESENTER: **Thomas Plunkett**

AUTHORS: Karinna Saxby, Yuting Zhang

Background: In Australia, most prescription medications are subsidised under the Pharmaceutical Benefits Schemes (PBS), which has two tiers: concessional (i.e., low income patients, welfare recipients, and pensioners) and general patients. Unfortunately, many individuals still report delaying or not filling a prescription when needed, due to cost. As a measure to prevent this, once patients' spending on medications reaches certain thresholds in a calendar year, they can obtain medications at reduced cost for the rest of that year under the PBS's Safety Net program. In 2021, the PBS Safety Net threshold for concessional patients was $316.80 (equivalent to 48 prescriptions) and $1,497.20 for general patients (equivalent to approximately 37 full copayment prescriptions). We aimed to study how people respond to reaching their safety net. Specifically, how they change their medication consumptions after reaching the threshold and whether this could be indicative of delayed or missed prescription in the pre-period. We also aimed to explore if this varies across therapeutic groups. **Methods:** We used a national administrative dataset containing PBS data linked with Australian Census data, for 2021. We identified general patients and concessional patients through their first identified copayment after reaching the safety net threshold, and then examined their medication use patterns each month before leading to, and after reaching, the safety net threshold. We utilised a dynamic difference-in-differences approach to study the effect of reaching the safety net on individuals' medication consumption. Analyses were stratified by concessional status and Anatomical Therapeutic Chemical (ATC) classification, with results presented in event-study analyses. **Results:** We found that individuals filled more prescriptions after reaching the safety net. This varied significantly between concessional (i.e., lower income) individuals and general patients, and with ATC groups consisting of more chronic medications than acute medications. **Conclusion:** We identified that individuals fill more prescriptions after reaching the safety net, especially lower income individuals, suggesting that individuals are delaying or not filling prescriptions before reaching the threshold, which harms adherence. This is in line with recent surveys. We also found this is more pronounced for therapeutic groups associated with more chronic medications. Recent policy changes have lowered copayment amounts and safety net thresholds, resulting in cheaper medication for patients. However, these policies have not impacted all groups equally, and our research contributes to the idea that the PBS Safety Net program could be improved to reach individuals who would benefit most from it.

1:30 PM –3:00 PM WEDNESDAY [Health, Its Valuation, Distribution And Economic Consequences]

Bali International Convention Centre – Karangasem

Breaking the Cycle: Mental Health, Structural Inequities, and Economic Resilience Across Generations

MODERATOR: **Sara Ciarlantini**,

Ind-355 Understanding the Impact of Maternal Depression on Offspring Later Life Socioeconomic Outcomes in Canada

PRESENTER: **Claire de Oliveira**, Centre for Addiction and Mental Health

AUTHORS: Emmanuelle Arpin, Jemimah Ride, Margaret Jamieson

Abstract

Background: According to the World Health Organization, depression is a leading cause of disability worldwide and a major contributor to the overall global burden of disease. Depression can affect not only the depressed individual but also those with whom they interact, such as their children. The negative effects of maternal depression on offspring can occur as early as in utero and infancy to childhood and remain through adolescence. Some research has also found that maternal mental health can continue to impact offspring psychosocial health into adulthood. However, few studies have examined the impact of maternal depression on socioeconomic outcomes of offspring in adulthood largely due to the lack of suitable, longitudinal data. Furthermore, existing work has mainly relied on survey data, which can be subject to self-reporting biases. To date, no related work has been done using Canadian data.

Objectives: Using a novel linkage between Statistics Canada's National Longitudinal Survey of Children and Youth (NLSCY) and the T1 family file tax return (T1FF), this study seeks to understand the role of maternal depression on offspring adult socioeconomic outcomes and, if present, determine whether this impact differs by offspring socio-demographic characteristics (sex, race and ethnicity) and family/household characteristics (household income, maternal education, single vs. two-parent household, family size, frequency of maternal depressive periods). In addition, this work aims to explore the mechanisms through which maternal depression affects offspring adult outcomes via adolescent outcomes.

Methods: This analysis is guided by the Cunha and Heckman's skills production model, where adverse conditions (i.e., presence of maternal depression) occurring during the developmental period have the potential to hinder the production of health and skills and ultimately impact later life outcomes. This analysis also draws on Jacobson's extension of Grossman's model, where the family is conceptualised as a producer of health. Several models are estimated to understand the role of maternal depression (measured by a shortened version of the CES-D), during childhood and early adolescence, on post-secondary education, after-tax individual income, and receipt of social assistance when offsprings are young adults, while controlling for relevant covariates. A covariate decomposition approach, commonly used in the intergenerational income mobility literature, is employed to explore the mechanisms through which maternal depression affects offspring adult outcomes via adolescent outcomes (e.g., test scores).

Results: The NLSCY-T1FF linked dataset produced a sample of 15,000 individuals between the ages of 0 to 11 years in 1994 whose socioeconomic outcomes were examined in 2015, when they were between the ages of 21 and 32. Descriptive and regression analyses are currently under way by the research team. **

Discussion: Depression exerts enormous health and economic burdens on the health care system. Little work has examined maternal depression as a determinant of offspring adult socioeconomic status. Developing interventions and programs that target maternal mental health (in addition to offspring health) may help impede the negative trajectories of functioning that can extend into adolescence and adulthood and, in turn, increase the likelihood that children of depressed mothers grow into healthy, capable individuals later in life.

Ind-911 Beyond Health Care Costs: Drivers of Health-Related Production Losses in Switzerland

PRESENTER: **Mr. Simon Wieser**, University of Zurich
AUTHORS: Christina Vetsch-Tzogiou, Christoph Thommen Sr., Xavier Schärer, Andreas Kohler, Michael Stucki, Yaroslava Zemlyanska

Background: Production losses caused by temporary or permanent reductions in working capacity constitute a substantial economic impact of poor health. However, they are rarely analyzed beyond isolated cost-of-illness studies. While most countries systematically monitor health care spending, there is no equivalent framework for measuring production losses. Consequently, the magnitude of these costs, their different forms —such as absenteeism, presenteeism, disability, and premature death—and their distribution across diseases, age and sex remain unclear. This study aims to quantify total production losses in Switzerland using a human capital approach for the years 2012, 2017, and 2022, examining the trends in their different forms and identifying the diseases driving these losses.

Methods: Our analysis followed a two-step approach: First, we calculated the total production losses by their different forms and aggregated them into their yearly totals. Second, we decomposed these losses by disease, age, and sex. We drew on multiple data sources, including national statistics on work volume, income, and causes of death, the Swiss Labor Force Survey, and a workforce panel survey covering working conditions, health issues, and the Work Productivity and Activity Impairment Questionnaire. Additionally, we accessed detailed data from the national disability insurance scheme. The data on production losses due to premature death and disability included diagnostic information, allowing clear attribution of these losses to specific diseases. In contrast, data for absenteeism and presenteeism were limited, covering only a selected subset of major diseases. To address this limitation, we applied a stepwise regression analysis, first attributing losses to uncoded diseases and then allocating the remaining losses to coded diseases.

Results (preliminary): Production losses amounted to 70.7 billion Swiss Francs (CHF, 1 CHF ≈ 1 USD in 2022), equivalent to 9% of Switzerland's GDP in 2022, representing a 15% increase compared to 2012. In 2022, presenteeism accounted for the largest share of production losses (48%), followed by absenteeism (26%), disability (18%), and premature death (8%). Musculoskeletal disorders (16%), mental disorders (15%), injuries (15%), and cardiovascular diseases (10%) were the leading causes of absenteeism, while 26% of absenteeism-related losses were attributed to uncoded diseases. Across all forms of production losses, mental disorders had the greatest impact, contributing 18% of total losses, with younger age groups being particularly affected.

Conclusions: In 2022, total production losses in Switzerland were only slightly lower than total health care spending (91.5 billion CHF). Combined, these costs represented over 20% of the country's GDP. Among the working-age population, production losses substantially exceeded health care expenditures. Production losses were primarily driven by high prevalence and often chronic conditions such as musculoskeletal and mental disorders. As labor shortages intensify and the population ages, understanding the factors contributing to various forms of production losses becomes increasingly vital. This knowledge is essential for developing effective policies to address their growing social and economic burden.

Ind-663 Estimating Lifetime Cost of Sexual Violence in the UK: An Analysis Using Administrative Data from Rape Crisis Services

PRESENTER: **Estela Capelas Barbosa**, City, University of London

Background: Sexual violence is a crime that has devastating consequences for its victims, including physical and mental health-related problems that result from trauma. In the UK, there is little evidence around the lifetime costs of sexual violence.

Methods: The aim of this study is to estimate the lifetime cost of sexual violence in Essex, UK and evidence return on investment for support services. There are three main methodological components to this study. First, a rapid review using a systematic approach was be conducted to identify relevant unit costs that may be attributable to child and adult sexual violence, which identified 26 relevant publications. Second, administrative data from three Rape Crisis centres was analysed, and regression predictions based on multiple imputation used to infer adjusted relative probabilities attributable to each victim of sexual violence and abuse. Administrative data was also be used to infer the duration of harm where relevant. Finally, an estimate of the cost of sexual violence and abuse was be calculated by cost component, differentiating between child sexual violence and adult sexual violence.

Results: The literature review enable the identification of relevant unit costs. Wherever possible, cost to public funds were preferred as a unit of measurement. We calculated the relative probability for the cost components, where the literature review did not identify a lifetime per victim cost. This enabled the relative probability to account for repetition, that is, when a victim appears in the dataset twice. We assumed that in this case, either there was multi-victimisation or that the abuse had not stopped after the first completion of support. Based on the fully imputed dataset, the likelihood of costs to education was 0.02 or 2%. This was only relevant for victims aged 16 and below. The adjusted probability of use of use of health services was 1.25 per victim. The adjusted probability of police involvement was 0.61 for cases of adult sexual abuse and 0.53 for cases of child sexual abuse (CSA). The lower probability for CSA is likely a result of the long lag between the incident(s) and reporting to the police in cases of CSA. Finally, the relative probability of QALY loss was estimated based on the disability weights for sexual violence

estimated by Global Burden of Disease Collaborative Network, 2018, and for productivity loss, relative proportion is the relative risk of unemployment, the unit cost is the ONS average salary in the UK and 37.4 years is the average work life. The estimated lifetime cost of child sexual abuse using administrative data from Rape Crisis centres in Essex is £472,048.53. In turn the estimated lifetime costs of adult sexual abuse using administrative data from Rape Crisis centres in Essex is £248,431.50.

Conclusions: Sexual abuse is more costly than previously estimated in other studies. While not directly comparable, our study reinforces the further need to make best possible use of administrative records to address gaps in knowledge. Further studies should focus on lifetime costs of victims with disabilities and other co-morbidities.

Ind-1962 Falling Behind: The Impact of Severe Mental Health Shocks on Prime-Age Workers' Labor Market Outcomes

PRESENTER: **Kamrul Islam**, NORCE Norwegian Research Centre & University of Bergen, Norway
AUTHOR: Egil Kjerstad

Background Working adults with severe mental disorders face significant challenges in the labor market, including reduced working hours, absenteeism, low wages, unemployment, and early exit from the workforce. Mental health shocks can impact labor market outcomes through multiple pathways. However, causal analysis of the relationship between mental health and labor market performance is complicated by the potential endogeneity of mental health shocks. Research needs to address these competing explanations in non-experimental settings. This study uses comprehensive registry data and advanced econometric techniques to examine the effects of severe mental health shocks on labor market outcomes, while also contributing to the understanding of ongoing research challenges in this field. **Data and Methods** Our data are obtained from different registry sources: health data come from the Norwegian Patient Register, socio-demographic, wage income, and disability pensioner (DP) data are gathered from Statistics Norway (SSB), and labor market participation data come from the FD-Trygd. We merged the datasets and organized the data as panel/longitudinal data. Our sample includes healthy individuals aged 24-45 who participated (n=892,991) in the labor market at baseline (2008/09). To analyze their labor market performance, we follow the cohort prospectively from 2010 to 2019 (N=5,725,949). We use a staggered difference-in-differences (DiD) design to estimate treatment effects, accounting for differential treatment effects across time and individuals. We define the treatment (event) as the first onset of an severe chronic mental health condition, such as schizophrenia, major depressive disorder, or bipolar disorder. To ensure the validity of the staggered DiD estimation, we rely on key assumptions, including staggered treatment adoption, which assumes that once individuals receive treatment, they remain treated throughout the observation period. Initially, we consider never-treated workers as the comparison group. To address potential endogeneity in treatment timing, we subsequently employ not-yet-treated groups and perform pre-treatment trend tests to validate the identification strategy. The average treatment effects on the treated (ATT) are estimated and aggregated within an event study framework. **Results** Our results show that, compared to never-treated workers, the treated workers' ATT is negative and significant: they are 11% less likely to be employed, and an increased probability of being on disability pension (7.7%) compared to never treated workers. Compared to not-yet-treated workers these probabilities are 7% and 3.8%, respectively. A similar negative impact is observed in the probability of earning lower wages (132%) and FTE (9.7%) compared to never treated workers. Compared to not-yet-treated these probabilities are 79.8% and 4.3%, respectively. Moreover, these negative effects vary notably by education level of the workers, highlighting the importance of accounting for heterogeneity across groups. Importantly, the identification strategy is supported by the absence of pre-tretment trends among not-yet-treated groups, whereas never-treated units exhibit inconsistent trends. **Conclusion** Our study concludes that severe mental disorders have a significant negative impact on various labor market outcomes. The magnitudes of the effects varies by education level, with lower-educated groups experiencing more negative impacts. These effects not only harm individuals directly affected by mental health issues but also have the potential to widen existing socioeconomic inequalities. Given the growing emphasis on work activation policies in many developed countries, it is crucial that future policy evaluations account for the specific challenges faced by individuals with mental disorders.

1:30 PM –3:00 PM WEDNESDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Frangipani

Healthcare Preferences and Discrete Choice Experiments

MODERATOR: **Marcel Bilger**,

Ind-771 Patient Preferences for Long-Acting HIV Treatment among people with HIV in Kenya: A Preference Heterogeneity Assessment.

PRESENTER: **Enrique M Saldarriaga**, University of Washington
AUTHORS: John Kinuthia, Jacinda Tran, Douglas Barthold, Naum Jepkosgei, Brett Hauber, Susan Graham, Catherine Maina, Anne Kaggiah

Abstract

Background. Adherence to antiretroviral therapy (ART) remains an important barrier to achieving viral suppression in many sub-Saharan African countries, including Kenya, where approximately 1,4 million people were living with HIV in 2023. Long-acting ART (LA-ART) regimens are emerging alternatives to daily oral HIV treatment, designed to improve adherence. While LA-ART regimens are being rolled out in the United States as they become available, they are not yet available in most African settings. Understanding end-users' preferences for these therapies is crucial to increasing their uptake when rolled out.

Aim. We elicited preferences for LA-ART among people living with HIV in Kenya, explored heterogeneity in these preferences and investigated the association between preference heterogeneity and sociodemographic and psychosocial characteristics.

Methods. We designed a discrete choice experiment (DCE) to elicit preferences for LA-ART attributes. We recruited 700 participants from the Kenyatta National Hospital Comprehensive Care Clinic and two Sex Workers Outreach Program (SWOP) clinics in Nairobi, Kenya between January 2023 and February 2024. Each participant answered 17 choice-tasks, each with 2 hypothetical LA-ART alternatives and current daily oral therapy. Each LA-ART profile was defined by mode (long-acting oral pills, injections under the skin, injections into the muscle, and implants), pain, frequency, location of treatment, pre-treatment time undetectable, pre-treatment negative reaction testing, and late-dose leeway. Participants also answered demographic and psychosocial questions and provided consent to link their clinical data. We fitted a latent-class model to the DCE data and assigned class membership to each participant, then estimated a multinomial logit model to explore associations between class membership and participant characteristics.

Results. We found three classes in our DCE data. All classes preferred some form of LA-ART over their current daily oral therapy. Class 1 (38%) had a relatively high preference for injections (subcutaneous or intramuscular), Class 2 (21%) for LA-oral tablets, and Class 3 (41%) for implants. Classes 1 and 2 showed significant preference for "clinic" over "home" for treatment administration, while Class 3 was indifferent to this attribute. Compared to Class 2 participants, Class 1 and 3 participants had more experience with injections, were less likely to hate injections, and were less likely to be sex workers or men who have sex with men. Further, Class 1 was more likely to have private insurance, less likely to have a social support system, and less likely to be heterosexual. Conversely, Class 3 was more likely to have housing insecurity and less likely to be male.

Conclusions. Our findings show associations between heterogeneity in preferences for LA-ART options and demographic and psychosocial characteristics. These results provide a deeper understanding of the preference landscape for LA-ART. Preference heterogeneity can aid in the development of interventions better aligned to patients' needs, which may increase LA-ART acceptability, uptake and adherence.

Ind-131 Preferences of Cancer Survivors for Follow-up Care in China: Discrete Choice Experiment

PRESENTER: **Yiqi Xia**
AUTHOR: Ping He

Background: As cancer survival rates improve, follow-up care has become crucial for enhancing the quality of life among cancer patients. In China, where cancer incidence and survival rates are rapidly increasing, understanding the preferences of cancer survivors regarding follow-up care is essential. While previous studies have explored the preferences of cancer patients for follow-up care in developed countries, there is a lack of research on the perspectives of patients in China and other developing nations.

Objective: This study aims to elicit the preferences of cancer survivors in China concerning follow-up care using a discrete choice experiment (DCE) to inform healthcare strategies that enhance survivor satisfaction and health outcomes.

Methods: A discrete choice experiment was designed to investigate cancer survivors' preferences in China based on six key attributes of follow-up care, including care provider, thoroughness of follow-up contents, follow-up interval, delivery method, duration, and content of care. Data were collected from 192 participants online, and a mixed logit model was employed to analyze the results, allowing for the examination of heterogeneity in preferences. Additionally, latent class analysis was conducted to identify differences within the sample that exhibit distinct preferences.

Results: The care provider, follow-up interval, and delivery method were found to significantly influence cancer survivors' preferences for follow-up care in China ($p < 0.05$). Specifically, the study revealed strong preferences for follow-up care delivered by specialist doctors, at twice-a-month intervals, and online compared to the care provided by general practitioners, once three months and via telephone, respectively. The latent class analysis identified two distinct subgroups, highlighting variability in preferences based on demographic factors and cancer types. Class 1 favored consultations with specialist doctors, shorter intervals, WeChat communication, longer durations, and psychological support content, while Class 2 preferred follow-up with specialist nurses, longer intervals, telephone communication, shorter session durations, and advice on health management and complications. Simulated probabilities indicated a substantial increase in the likelihood of choosing follow-up care when delivered by preferred providers under optimal conditions. Notably, interactions with demographic factors such as age, marital status, and education revealed significant heterogeneity in preferences, emphasizing the impact of these characteristics on survivors' choices for follow-up care.

Conclusions: This study is novel to underscore the importance of tailoring follow-up care to the specific preferences of cancer survivors in China. The findings suggest that personalized follow-up strategies, particularly those involving specialist providers and preferred delivery methods, can significantly enhance patient engagement and satisfaction. Future healthcare policies should incorporate these preferences to improve the quality of follow-up care for cancer survivors.

Ind-1636 Preferences and Willingness to Pay for Pneumococcal Vaccines Among the Elderly in India: A Discrete Choice Experiment

PRESENTER: **Ramkrishna S L**
AUTHOR: Jeffrey Pradeep Raj

Introduction: Elderly people are at a high risk for severe illness from pneumococcal infections, such as meningitis and pneumonia. In order to device an effective immunization strategy, the preferences and willingness-to-pay (WTP) of elderly individuals in India for pneumococcal vaccines becomes important. The proportion of elderly in India is rising, and them being more susceptible to pneumococcal infections understanding their decision-making process is crucial. Utilizing a discrete choice experiment (DCE) framework, the study examines the trade-offs elderly are willing to make between key vaccine characteristics, such as efficacy, safety, and cost. *Methods*: The study is currently ongoing and is expected to be completed by Nov 2024 with a target sample size of 2000. A total of 843 participants were enrolled against a target of

2000. The study included consenting Indian citizens aged 60 years and older, regardless of biological sex. Participants were invited via an online link shared across various digital platforms. The questionnaire was divided into three sections: (1) socio-demographic details, (2) medical history and COVID-related information, and (3) a discrete choice experiment (DCE) presenting six pairs of hypothetical pneumococcal vaccines. Each vaccine was described using a fixed set of attributes such as effectiveness, side effects, cost, number of doses, duration of protection, and place of administration, with varying levels for each attribute in the paired comparisons. Responses that were incomplete or did not meet pre-defined quality standards were excluded from the analysis. *Results*: Of 941 respondents, 98 failed the trap question and 843 responses were finally analysed. The most important attributes were duration of protection followed by effectiveness. Respondents were willing to pay INR 4085 (48.41 USD), INR 3254 (38.56 USD), and INR 2898 (34.34 USD) per dose for vaccines offering lifelong, 10-year, and 5-year protection, respectively, compared to 1-year protection. Additionally, they were ready to pay INR 2277 (26.98 USD) for a vaccine with 70% effectiveness and INR 2042 (24.20 USD) for 90% effectiveness over a vaccine with 50% effectiveness. Vaccine hesitancy (to at least 3/6 vaccine pairs) was seen in 6.88% *Conclusions:* Duration of protection and effectiveness are key factors influencing pneumococcal vaccine preferences among the elderly in India. Before implementing a nationwide policy on pneumococcal vaccination for the elderly, it is crucial to understand their preferences, assess their affordability and willingness to pay, and address concerns about vaccine hesitancy.

Ind-524 Preference for Ambient-Assisted Living Services Among Older Chinese Adults: A Discrete Choice Experiment

PRESENTER: **Jin Liu**
AUTHORS: Anli Leng, Stephen Nicholas, Elizabeth Maitland, Jian Wang

Background: At the same time as China's aging population leads to a surge in demand for old-aged care, China faces a shortage of formal caregivers. One way to address the shortage of formal old-aged care, ambient-assisted living (AAL) services uses artificial intelligence (AI)—infused applications and platforms that promote independent living by utilizing assistive technologies to help older adults control age-related diseases, manage age-related health conditions and improve old-aged wellness. By promoting safe and independent aging in place, AAL can alleviate the care burden on family members, formal caregivers and the health system. Studies have confirmed the effectiveness of AAL services, indicating AAL's potential to address critical gaps in old-aged care. Surprisingly, there has been little research on older adults' decision-making towards emerging AAL services. This study investigates older Chinese adults' preferences and willingness-to-pay (WTP) for AAL services and explores the factors influencing AAL services decision-making.

Methods: Through stratified random sampling, a discrete choice experiment (DCE) was conducted with adults aged 60 and above across five cities in Shandong Province in August 2024. Each DCE scenario encompassed six attributes: service location, service function, difficulty, security, out-of-pocket payments and quality of life. Data were collected through face-to-face interviews using a structured questionnaire administered by trained investigators. Preferences, relative importance (RI) of attributes and the marginal WTP were estimated using a mixed logit model. Preference heterogeneity was examined by subgroups analysis.

Results: A DCE survey was completed by 235 older adults. All six attributes had a significant impact on older adults' preferences, with security, quality of life and service location identified as the most important factors. Participants preferred AAL services at home (vs nursing institutions, β=-0.454, $p<0.01$); focused on daily living assistance (vs psychiatric care, β=0.262, $p<0.05$); lower difficulty (vs high difficulty, β=0.327, $p<0.01$) and higher security (vs low security, β=0.736, $p<0.01$); enhanced quality of life (good vs poor quality of life, β=0.497, $p<0.01$); incurred lower out-of-pocket payments (β=-0.002, $p<0.01$); and with the maximum WTP of US$129.747 per month. The predicted uptake rate for the optimal AAL services scenario (home-based services, providing health management, low difficulty, high security, good quality of life and cost of US$14.04 per month) was 66.6%. Participants were willing to pay US$61.20 (95% CI: US$38.22, US$93.82) for improved security and US$41.36 (95% CI: $20.99—US$67.54) for a better quality of life. There was heterogeneity in the preferences of older adults with different gender, urban-rural residence, and health status characteristics.

Conclusions: This study revealed older adults' preferences to improve the design of effective AAL services. Policymakers should prioritize enhancing service security and improving quality of life to increase older adults' acceptance and satisfaction with AAL services. We recommend designing tailored AAL services solutions that address the diverse demands of older adults to improve old-aged care quality and older adults' overall well-being.

Ind-543 Examining Preferences for Public Healthcare Provision of Rural Residents in China: A Discrete Choice Experiment

PRESENTER: **rui liu**
AUTHORS: Xiaoying Zhu, Weidong Huang, Miao Miao

Abstract Background: The rural healthcare system plays a vital role in providing essential health service to rural population and contributing significantly to promoting health equity. However, the underutilization of rural healthcare services remains a persistent issue. The study aims on assessing the rural residents' preferences on public healthcare to provide evidence for policy makers in making rural healthcare service delivery more responsive to rural residents' health needs. Methods: A Discrete Choice Experiment (DCE) was conducted to assess preferences of the rural residents in Heilongjiang province, China. Drawing from the literature review, Anderson model, preference exercise, and Delphi method, six attributes were identified and included in the choice experiment questionnaire. The data collection was implemented between June and December 2021. Using stratified random sampling method, 13 cities in Heilongjiang Province were divided into three levels according to their economic development level. 4 rural areas were randomly selected for each level, and 52 rural residents were randomly recruited for each rural area. Mixed logit and latent class logit (LCL) models were used to analyze residents' preference. Results: A total of 536 participants completed the questionnaire, and the response rate is 85.8%. The attribute "Healthcare provider type" was found as the most significant factor influencing public healthcare services preference, followed by "Public medical institution type (PMI)", "Travel time", "Available diagnosis and treatments", and "out-of-pocket (OOP) payment". Preferred services included higher-level of hospitals, specialist, a broader range of diagnoses and treatments, closer distance and lower OOP expenses. For participants without chronic diseases, the type of PMI was the most influential

factor, while for those with chronic diseases, the healthcare provider type was the most important. The LCL model results suggested that the Class 1, labeled as "Quality Seekers," preferred healthcare services provided by specialized practitioners in large hospitals; the Class 2, labeled as "Positive Accessibility and Affordability," favored services located within 30 minutes of travel and with low OOP payments. Conclusions: Our findings provide valuable insights into public healthcare utilization preferences among rural residents. The results underscore the importance of healthcare provider quality, PMI type, travel time, and available diagnostic and treatment options in healthcare policy decision-making. **Keywords** Public healthcare provision; rural residents; preference; discrete choice experiment

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1:30 PM –3:00 PM WEDNESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Dahlia

Vaccination Costs

MODERATOR: **Brendan Kwesiga**, UNICEF

abs-os475 The State of the Evidence on Immunization Delivery Costs in Low- and Middle-Income Countries: Findings From a Systematic Review

PRESENTER: **Ms. Christina Banks**, ThinkWell
AUTHORS: Ms. Flavia Moi, Ms. Laura Boonstoppel, Syed Najibullah, Afroja Yesmin

Background: Evidence on immunization delivery costs is key to ensure that immunization programs are adequately funded and achieve their coverage targets. With 40 vaccines prequalified by WHO since 2020 and more essential vaccines about to enter the market, it is crucial that countries and donors understand the costs of delivering immunization services in LMICs, how costs differ across settings, antigens, and delivery strategies, and where evidence gaps remain. To this end, we conducted a systematic review to shed light on the state of the evidence on immunization delivery LMICs.

Methods: We conducted a systematic review of 4,853 resources published between March 2019 and December 2023. We included studies conducted in LMICs that reported immunization delivery unit costs, and excluded resources that only presented secondary data or modelled cost estimates. 607 unit costs as well as contextual information about the study setting (including vaccine delivered, delivery strategies, target population) and costing methodology were extracted from 51 publications matching the inclusion criteria, and compiled into a publicly available database—the Immunization Delivery Cost Catalogue (IDCC)—which presented results from a previous review. We then conducted a descriptive and evidence gap analysis of all unit costs in the IDCC and estimated the median, minimum, and maximum cost per dose across comparable datapoints.

Results: We found that immunization delivery cost evidence exists for 49 countries (36% of all LMICs). 73% of evidence is for routine delivery, 20% for supplementary immunization activities (SIAs) and 7% combine routine and SIAs. Only 16% of the studies reported unit costs for more than one delivery strategy. We identified evidence gaps on the cost of delivering through different strategies and to specific target populations (e.g. zero-dose children, out-of-school girls, the elderly), on specific types of SIAs (e.g. integrated campaigns, outbreak responses conducted during epidemics) and for new vaccines (e.g. mpox, dengue, HepB) for which currently there is none.

We found that with a median cost per dose of $1.34 (min-max: $0.11-$36.74) routine delivery is costlier than SIAs ($0.52, min-max: $0.17-$3.86) on a per dose basis. Outreach is the costliest delivery strategy ($3.73, min-max: $0.44-$27.27), while facility-based delivery is the least costly ($1.65, min-max: $0.08-$22.27). Targeting adults is more costly than reaching children, with COVID-19 priority populations being the costliest to reach ($2.85, min-max: $0.96-$5.34) and infants and children under 15 yo being the least costly target population (median: $0.63, min-max: $0.17-$3.51). Evidence for delivery of a single vaccine shows that vaccines targeting adolescents, adults, and priority groups are costlier to deliver per dose, with influenza (median: $3.75, min-max: $1.58-$5.85), HPV (median: $2.56, min-max: $0.39-$33.15), and TT/Td (median: $2.23, min-max: $1.57-$5.06) being the costliest on a per dose basis.

Conclusions: The cost evidence compiled by our review can be used for planning and budgeting at country level, and to inform resource mobilization and advocacy at regional and global levels. Moreover, our analysis provides a comprehensive overview of the existing evidence base on immunization delivery costs and highlights persisting evidence gaps, providing valuable insights on areas where further research is needed.

abs-os108 Approximating Reaching Zero-Dose Children With Standardized Country-Level Routine Outreach Vaccine Delivery Unit Cost Estimates

PRESENTER: **Allison Portnoy**
AUTHORS: Taylor Holroyd, Emma Clarke-Deelder, Dr. Tewodaj Mengistu, PhD

****Background**** The Immunization Agenda 2030 aims to reach all people with immunization services, including ‘zero-dose’ children—children who have not received any routine vaccine. To plan for the efforts to reach zero-dose children with needed vaccinations and make informed decisions to improve immunization coverage and equity, decision-makers need to know how much these efforts will cost. Without widely available primary data, there is a need for proxy estimates for the costs of extending vaccine delivery to zero-dose children who are typically part of disadvantaged and hard-to-reach populations. This project aims to approximate the costs of reaching zero-dose children with standardized country-level estimates of vaccine delivery unit costs for outreach delivery for low- and middle-income countries (LMICs).
****Methods**** We extracted estimates of the outreach delivery cost per dose for childhood immunization services from the 2024 update of the Immunization Delivery Cost Catalogue. We used these data to construct a prediction model for estimating standardized outreach vaccine

delivery unit costs. A meta-regression approach was used to incorporate factors expected to predict unit costs as a function of a set of country-level and study-level predictors (study year, economic or financial cost, routine or campaign delivery, full or incremental costing approach). The fitted prediction model, specified as a generalized linear regression model, assuming a Gamma distributed outcome and a log link function, was used to estimate outreach vaccine delivery costs per dose in 130 LMICs for the year 2023. ****Results**** We estimated the prediction model using results from 48 observations across 19 countries specific to outreach or mobile delivery of childhood vaccines. The best fit model with study-level predictors included reported diphtheria-tetanus-pertussis (DTP3) coverage and under-five population size. For 2023, the predicted mean economic cost per dose was $7.91 (95% uncertainty interval $2.44–20.14), averaged across all 130 LMICs. ****Conclusions**** Reaching zero-dose children is crucial for improving equity in global health, and estimates of the costs of doing so are needed to inform budgeting for immunization programs. Our study provides estimates produced via meta-regression analyses that can help countries to improve budgeting and planning for implementation of future interventions to reach zero-dose children.

Ind-1980 A Rapid Systematic Review of Costs, Cost-Effectiveness and Budget Impact of Measles, Malaria and Meningitis Vaccination Strategies in Africa

PRESENTER: **Charles C Ezenduka**
AUTHORS: Nkolika Uguru, Obinna Onwujekwe, Enyi Ifeoma Etiaba, Chibueze Anosike

Abstract

Background/objective:

The effectiveness of vaccines is critical to achieving the goal of disease control and elimination in mostly LMICs, constrained by limited resources and underfunding. In the face of dwindling resources and declining donor support, Africa remains mostly underserved with minimal coverage. We conducted a rapid review of published studies on the costs, cost-effectiveness, and budget impact analysis of priority vaccine delivery in Africa, to generate relevant information to strengthen evidence generation and inform policy for improved efficiency of vaccine coverage. The rapid review was necessary for faster decisions and further efforts at generating empirical evidence to inform vaccine policy for enhanced coverage in Africa.~~

Methods: We conducted a rapid systematic review of published literature on the costs, cost-effectiveness, and budget impact analysis of priority vaccine strategies to prevent measles, malaria, and meningitis in African countries, to synthesize information to achieve desired objectives. As a rapid review, we only searched reliable large electronic databases PubMed and HINARY using standard search terms and covering human studies published in English between 2004 and 2024. Our search also included reference tracing of selected studies. Following title and abstract screening, we appraised the quality of included studies in line with the standard guidelines to extract and report relevant data on costs, cost-effectiveness and budget impact of identified strategies. Where possible, incremental cost-effectiveness ratios (ICERs) were calculated to describe the efficiency of each intervention in increasing coverage.

Results: Our initial search yielded a total of 758 articles from which 49 which met inclusion criteria were selected following screening. A total of 23 of the 49 full text articles were finally appraised for quality and data extraction. Measles vaccine delivery was evaluated in ten (10) studies, closely followed by malaria vaccine, (9) and meningitis (4) studies. **S**trategies that increased immunization coverage and cost-effective were implemented alongside RI/EPI (16). No intervention accounted for the most common (8) comparator across studies. Transmission, mathematical, and Markov models were the predominant modeling tools (11). Costing measures varied significantly across studies, with implications on planning and budgeting. Majority (65%) of vaccination outcomes were measured in DALYs, with malaria accounting for 53%. Almost all malaria vaccination studies (8) included DALYs as an outcome measure, with ICER varying between seasons and countries, @$30 - $200 per DALY averted. For measles, ICER ranged between $1.5 and $861 per DALY averted. In 48% of the studies, vaccination outcomes reported cost savings - 7 in~~ measles, and 2 each in malaria and meningitis respectively.

Conclusion:

Our findings suggest very limited quantitative evidence on the costs, cost-effectiveness, and budget impact analysis of published vaccine strategies in Africa. Costing evidence needs more efforts for improvement and reporting to enhance more efficient allocation of resources in programs for improved coverage. Standardization of costing methods is highly recommended to enable the synthesis and use of cost data. Findings reveal scope for improved evaluation of strategies with comparable reliable methodological approaches to strengthen evidence generation for vaccine policy and planning for efficiency of service delivery and improved immunization coverage.

Ind-1409 Exploring the Cost Implications of Vaccine Regimen Changes: Evidence From Ethiopia's Switch to a Single-Dose Human Papillomavirus Vaccine Regimen

PRESENTER: **Mercy Mvundura**, PATH
AUTHORS: Belayneh Anteneh, Diriba Bedada, Rose Slavkovsky

Introduction

Based on a 2022 World Health Organization endorsement, countries have the option to implement a single- or two-dose human papillomavirus (HPV) vaccine regimen since a single dose of HPV vaccine was shown to have comparable efficacy and duration of protection as multiple doses. It may also offer program advantages including simplified logistics associated with delivering fewer doses, potential for improved vaccination coverage, and anticipated cost savings for vaccine procurement and delivery. However, the evidence on the cost implications of a single-dose HPV vaccine regimen is based on modeling. Our study aims to provide real-world evidence on the program cost implications and

operational context associated with a switch to a single-dose HPV vaccination regimen.

Methods

Ethiopia administered a single-dose HPV vaccine regimen to a cohort of 9- to 14-year-old girls during a November 2024 campaign. We will use ingredients-based micro-costing methods to collect data to estimate the financial and economic costs of the vaccination activities. Stratified random sampling was used to select 80 health facilities that provided HPV vaccination services during the campaign, representing four regional and 36 woreda (district) administrative offices. During data collection scheduled for January 2025, we will use structured costing questionnaires to interview health facility staff responsible for providing HPV vaccination services and program managers at the sub-national administrative levels in our sample and at the national level. For each HPV vaccination program activity conducted, financial costs will be estimated including costs for vaccine and supplies procurement, per diems, meetings, fuel, and vehicle rental. In addition, opportunity costs—such as the time costs for health and non-health workers involved in HPV vaccination program activities, as well as costs for capital (e.g., vehicles and vaccine storage equipment)—will be estimated. Numbers of vaccine doses administered and adolescents vaccinated (data from immunization program records) will be used as denominators in the costing analysis. The costing will be done from the health system perspective. All costs will be reported in 2024 USD.

Results

Results are pending, but we will estimate the financial and economic costs per facility, and per adolescent vaccinated under a single-dose regimen. These estimated costs will be compared to those reported when Ethiopia was using a two-dose regimen: economic costs of $23.47 per adolescent receiving the full regimen, of which $13.55 were financial costs and $9.92 were opportunity costs. Under the two-dose regimen, vaccine procurement costs were the largest share of the costs, and human resource time was the largest share of the opportunity costs. So, there is potential for large savings in these costs with a single-dose schedule. We will characterize program context including number of HPV vaccination sessions conducted, locations where sessions were conducted, and frequency and intensity with which program activities were conducted under a single-dose schedule.

Conclusions

The evidence generated will inform program planning and budgeting. It will also be useful for local stakeholders trying to make the HPV vaccination program more affordable and sustainable and as other countries seek evidence on the cost implications of the regimen switch.

1:30 PM –3:00 PM WEDNESDAY [Health Care Financing & Expenditures]

Bali International Convention Centre – Denpasar A

Issues in Healthcare Financing

MODERATOR: **Jacob Novignon**, University of Ghana

Ind-2401 Optimising Scarce Resources to Improve Nutrition Outcomes in Low Resource Settings

PRESENTER: **Augustine Omodieke**

AUTHORS: Ibrahim Ibrahim, Yewande Ogundeji, Nduka Nelson, Godwin Onebunne

Background Nutrition and health outcomes in Nigeria have remained poor, with more than one-third of children under-5 stunted and at risk of death or impaired development. Despite the availability of cost-effective nutrition interventions which can address the drivers of poor nutrition outcomes, Nigeria has made very limited progress due to underinvestment and limited fiscal space for nutrition. In low resource settings (including Nigeria and many low- and middle-income countries), value for money through efficiency gains is a critical component for expanding fiscal space for implementing lifesaving interventions. Using Nigeria as a case study, we aimed to identify opportunities for more efficient resource allocation and spending for nutrition to accelerate improvements in nutrition outcomes within the context of constrained resources. **Methodology** A quantitative approach was utilized for this study aided by the Optima Nutrition tool. The tool contains a geospatial component to model and determine funding allocations that minimize stunting, wasting, anaemia and under-five mortality at both the national and regional levels. The model has a flexible intervention set that includes a variety of vitamin supplementation programs, infant and young child feeding education, treatment of severe acute malnutrition, treatment and prevention of diarrhoea, fortification of foods, and others. The study was conducted in four Nigerian states (Abia, Kaduna, Kano, and Oyo) to determine the best mix of cost-effective interventions to be prioritized and the investment requirement to accelerate nutrition results. In each state, a multisectoral Expert Working Group (EWG) was constituted, and trained on data requirements and conduct of optimization analysis. State specific databooks were completed (using national, state, and proxy data where applicable) and validated with specific objectives (targeting maternal and child outcomes) defined based on national targets, informing state specific optimization analysis. **Results** The optimization analysis showed that prioritizing (scaling up coverage levels), by reallocating more money to, a mix of interventions including Treatment of SAM, Micronutrient Powder, Iron and Folic Acid Supplementation (IFAS – at both health facility and community levels), Vitamin A Supplementation, as well as Infant and Young Child Feeding (IYCF 1,2,3) will collectively deliver greater gains in nutrition outcomes (including increased number of alive- and non-stunted, non-wasted, and non-iron deficient anemic children; and reduced child and maternal deaths) at the current spending level. Additionally, the analysis showed that with this intervention mix, these states could reduce prevalence of stunting, wasting, non-ID anemia in children and ID anemia in pregnant women by 1.8-9%, 3.2-50%, 2.2-12% and 10-18.25% respectively over a 5-year period by increasing their current annual investment in nutrition by up to (35%) Abia, (20%) Kano and Kaduna, and (30%) Oyo. **Conclusion** To achieve more nutrition for the money, it is crucial for nutrition financing to be optimized, and expenditure frugally planned. Many low- and middle-income countries with constrained fiscal space

can make remarkable progress towards achieving nutrition targets and consequently global targets utilizing the innovative Optima allocative efficiency analysis to determine the best intervention mix to be implemented (at both national and sub-national levels), and the incremental shift in annual nutrition investment required.

abs-os772 Assessing Fiscal Space for Health in Nigeria and Increasing Primary Health Care Facilities Spending

PRESENTER: **Stanley Chibuzor Ezenwa**

AUTHORS: Muhammed Muhammed, Aisha Aliyu, Joshua Elaigwu, Felix Abrahams Obi

The Nigeria Fiscal Space for Health initiative is a strategic endeavor aimed at significantly enhancing the financing of Primary Health Care (PHC) in three critical north central and northwest zones of Nigeria. This comprehensive study is being executed by the Health Financing Unit of the National Primary Health Care Development Agency (NPHCDA), with expert technical guidance from Results for Development (R4D), an organization renowned for its focus on improving health systems.

The core objective of this assessment is to conduct an in-depth evaluation of the fiscal space dedicated to health at the Primary Health Centres (PHCs). To achieve this, we employed a descriptive cross-sectional methodology that combines qualitative and quantitative research approaches, ensuring a robust analysis. Our research instruments included carefully validated semi-structured questionnaires and Key Informant Interviews (KII) that explored a range of critical factors, such as community health needs, budgetary revenues and expenditures, and specific areas of inefficiency in the PHC framework. Data collection was carried out by a team of trained field assistants, who utilized the Open Data Kit (ODK) applications to capture information electronically.

The key findings from this assessment reveal significant challenges faced by PHCs, particularly concerning perceived inadequacies in budgetary allocations that directly impact the delivery of health services. It was identified that budget releases to PHCs consistently fall short of the amounts that were allocated from the national and state, which poses formidable obstacles to effective implementation of health programs. Moreover, there are growing concerns regarding the insufficient financial support from pivotal sources such as the Basic Health Care Provision Fund (BHCPF) and the National Health Insurance Agency (NHIA), despite some reports highlighting potential positive impacts of these funds. The team uncovered substantial financial management gaps, including inadequate record-keeping practices and a limited availability of skilled human resources within health facilities, which hinder operational efficiency and accountability.

In response to these identified challenges, we propose a series of targeted recommendations aimed at strengthening the fiscal framework and financial management within the PHC system. These include comprehensive capacity-building initiatives for healthcare staff, enhanced supervision and monitoring mechanisms, and active engagement with financial managers to foster better management practices and optimize resource allocation.

In conclusion, this assessment powerfully underscores the urgent need for carefully targeted interventions to improve the fiscal space and financial management strategies in Primary Health Care across all six geopolitical zones in Nigeria. Moreover, it highlights the potential for these improvements to serve as a model for similar initiatives beyond West Africa, ultimately contributing to better health outcomes for communities.

Ind-1901 Driving Efficiency and Strengthen Strategic Purchasing in Malawi's Public-Private Partnership with a Major Faith-Based Healthcare Provider

PRESENTER: **Christian Abraham Arega**

AUTHORS: Francis Zhuwao, Andrews Gunda, Moses Zuze, Dumisani Enricho Nkhoma, Gerald Manthalu, Emily Chirwa, Stephanie Heung, Mihereteab Teshome, Joe Zonda, Dominic Albert Nkhoma

Background

The Christian Health Association of Malawi (CHAM), the largest non-governmental healthcare provider, delivers 37% of healthcare services nationwide and 75% in rural areas through a Public-Private Partnership (PPP) with the Government of Malawi (GoM). Through Service-Level Agreements (SLAs), CHAM facilities are contracted to deliver pre-defined services under a fee-for-service (FFS) provider payment mechanism, alongside a healthcare worker salary block grant.

While this partnership has expanded access, questions have emerged about its value-for-money (VfM) and the efficacy of the FFS mechanism. This study was commissioned to inform the renewal of the Memorandum of Understanding (MoU) between CHAM and GoM.

Research Questions

The study answered three research questions. First, it examined whether the salary block grant supported efficient service delivery compared to public facilities. Second, it evaluated the cost savings to the government from contracting CHAM facilities. Lastly, it investigated the effectiveness of the FFS scheme in facilitating timely payments and explored whether alternative payment mechanisms might enhance service delivery.

Methods

Workforce modelling was used to investigate differences in service delivery output relative to the expected service volumes between 60 CHAM and GoM facilities. To achieve this, expected service volumes were calculated using cadre-level staffing data and time-motion estimates for 36 services. These estimates were then compared to actual service volumes from facility-level data available in DHIS2 and used to generate efficiency scores. Commodity and drug costs were compared between private sector, Central Medical Store Trust (CMST), and SLAs. Furthermore, to understand challenges of the FFS model, 26 qualitative interviews were conducted with stakeholders from Ministry of Health, Ministry of Finance (MoF), CHAM and development partners funding SLAs. Finally, a payment process map was created by tracking invoices from 12 CHAM facilities to pinpoint bottlenecks in the funding flow.

Key Findings

Findings indicate that for inpatient services, complicated deliveries, antenatal visits, and certain HIV services, CHAM facilities correlate with higher efficiency scores. This efficiency, along with cost savings from SLA contracts — 93% of SLA drug and commodity prices were lower than private sector equivalents and 60% below CMST — supports the continuation of the SLAs as they provide good VfM.

Despite the demonstrated VfM of contracting CHAM, the process mapping exercise highlighted delays of up to 90 days in FFS reimbursements frequently resulting in drug stockouts and reduced service volumes, which compromise care quality and accessibility. Nonetheless, majority of the CHAM facilities surveyed favoured the FFS model, if payments are timely and perceived risk of financial mismanagement with upfront payments. Hence, digitizing the payment system was identified as a priority to streamline invoice processing and ensure timely payments to facilities, thus improving liquidity and service continuity. In the future, a hybrid model with partial upfront payments and/or capitation may be considered to further mitigate solvency risks and introduce stronger cost-control measures.

Conclusions

The findings of this study have been used to inform the renewal of the MoU between CHAM and GoM, including efforts to address provider payment bottlenecks, as the CHAM SLAs have proven to confer strong VfM to the GoM.

Ind-2865 Mapping Health Financing Policies to Improve Spending Efficiencies and Financial Risk Protection in Middle Eastern and North African Countries.

PRESENTER: **Diana Kizza**

AUTHORS: Reem Hafez, Palwasha Anwari

Background: Health financing is pivotal to achieving Universal Health Coverage (UHC), ensuring equitable, efficient, and transparent resource allocation to improve population health. The Middle East and North Africa (MENA) region encompasses 20 countries with diverse economic, political, and demographic contexts that shape health financing systems. Despite these variations, UHC is a shared priority across the region, reflected in national development plans. However, challenges such as fragmented health spending, high out-of-pocket (OOP) payments, inefficiencies in public health finance, and limited financial protection persist, threatening progress toward UHC. This review maps and describes government health financing policy instruments across MENA to assess government intent to address health spending challenges and promote equitable access to financial protection for health service delivery. **Method:** Qualitative review of publicly available health financing policies, laws, and strategies in the MENA region, with analysis guided by WHO's health financing core functions framework, focusing on revenue generation, pooling of funds, and purchasing of services to evaluate policy intent, design, and alignment with UHC goals. Documents were sourced from government websites, international agency repositories, and academic databases. Inclusion criteria prioritized publicly accessible documents that explicitly or implicitly addressed health financing. Qualitative content analysis using a coding framework with a thematic focus on objectives of equity, efficiency, and financial risk protection was adopted to identify policy intent and implementation approaches. The study does not assess implementation fidelity or policy effectiveness, nor does it include unpublished documents. Ethical considerations were addressed by exclusively analyzing publicly available data. **Findings:** Eighteen countries embed the right to health in their constitutions, but only three (Egypt, Morocco, and Sudan) have dedicated health financing strategies. Thirteen countries have health policies or strategies that implicitly address health financing, while nine have health insurance laws or policies, with some implementing mandatory schemes. Persistent challenges highlighted in these policies include high OOP spending, affecting up to 13 million individuals annually, and limited insurance coverage exacerbating inequities, especially in middle-income countries. Protracted conflicts also strain health systems, necessitating the extension of unplanned provision of healthcare to migrants and refugees. Innovative responses vary by income status. High-income countries (six Gulf States) leverage oil revenues to provide free universal healthcare but face rising costs from non-communicable diseases and are exploring value-based mechanisms. The eleven Middle-income countries are expanding health insurance coverage, reforming policies to address inefficiencies, and refining strategic purchasing mechanisms, such as capitation, pooled procurement, and benefit package reviews, to improve resource allocation. **Conclusion:** Health financing reforms in MENA are evident in national policies, and reveal significant government intent to tackle spending inefficiencies, access inequities, and financial risks on households. This reflects governments' intent to address persistent barriers of technical and allocative inefficiencies and high proportions of OOP spending. Strengthening governance, expanding pre-payment mechanisms, and enhancing purchasing strategies will be vital to optimizing resource use and improving financial protection across the region. Further work is required to assess the implementation and effectiveness of these policies to achieve UHC goals; particularly in conflict-affected and middle-income countries with reduced fiscal space for health.

Ind-388 Strengthening Health Financing in Complex Humanitarian Contexts: Analysis From Northwest Syria and its Implications for Other Disrupted Contexts

PRESENTER: **Sophie Witter**, Queen Margaret University Edinburgh

AUTHORS: Abdulkarim Ekzayez, Ibrahim Bou-Orm, Fouad Fouad, Sumit Mazumdar

Background

WHO has developed clear norms for strong health financing systems to support progress towards Universal Health Coverage (UHC). These guidelines presuppose relatively stable settings with established governance arrangements. However, the world has seen a growing number of increasingly protracted crises, which have left many countries with disputed authorities in all of parts of their territories. These complex humanitarian crises represent major hurdles against progress towards global commitments of and ensuring equitable, affordable, and sustainable access to essential health services. What does this mean for how health financing systems are configured and do we need to adapt our guidance? In this study, we examine the case study of Northwest Syria, where successive periods of protracted war and forced displacement have led to shifting, fragile, and donor-dependent health systems. Our study aims to contribute to actionable evidence on the optimal use of scarce financial resources to reduce fragmentation, increase resilience, and build sustainability in the context of Northwest Syria and similar areas which lack unified state-led governance.

Research question

What are the challenges and potential opportunities to build resilience in relation to the health financing functions and their governance in Northwest Syria?

Methods

The study took a mixed methods case study approach, using data from (1) a desk review of key reports, agency publications, and relevant databases, (2) key informant interviews and (3) expert meeting(s), including drawing on the expertise of the research group. These were analysed thematically and used to develop causal loop diagrams that capture the complexities of financing in this setting. Findings were then compared with international health financing guidance to probe how fit this guidance is for disputed areas and protracted emergency settings.

Results

We present a diagnostic of financing arrangements in Northwest Syria, using the framework of the WHO Health Financing Progress Matrix (HFPM), highlighting specific financing bottlenecks, especially around coordination across the multiple actors, and propose interventions to support sustainable health financing and system recovery. We also propose areas of adaptation of the framework to make it more suitable to these disrupted settings.

Conclusions and implications

We highlight health financing challenges but also opportunities for system strengthening in northwest Syria. While specific, these challenges reflect features that are commonly found in other disrupted settings, so better understanding of their nature and how to address them is important for moving ahead with UHC globally. Suggested adaptations of the HFPM for complex emergency and disputed settings is also a contribution to the development of this important normative and measurement tool.

Ind-333 Payment Compliance of The Informal Sector Workers in Indonesian National Health Insurance: A Thorough Study on Ability and Willingness To Pay

PRESENTER: **Wan Aisyiah Baros**, BPJS Kesehatan
AUTHOR: Dedy Revelino Siregar

ABSTRACT

Background: Currently the Indonesian National health Insurance (JKN) has covered more than 90% of Indonesia population. Although around 18% of the enrolees were inactive related to the incompliance of their premium payment. The proportion of inactive enrolees were varied among the four types of membership within the three types of class. This situation could impede accessibility to health services and affect the overall health status.

Objective: aims to measure the ability to pay (ATP) and willingness to pay (WTP) between the informal sector workers enrolees (PBPU); and to determine the factors affecting their compliance and commitment to pay JKN premium regularly. In addition, this study will explore the alternative sources of funding to support the informal sector workers enrolees in order to comply the payment of the JKN.

Methodology:The study was a nation-wide survey that covered fifteen districts and 4059 respondents, which examined the ability (ATP) and willingness to pay (WTP) among informal sector workers under the JKN scheme. WTP was examined using bidding game, while ATP was calculated as 5% of disposable income by using household expenditure as a proxy for household income. Logistic regression was used to explore the compliance factor with variables of interest that includes household expenditure, JKN class, regional area, commitment (for compliance), risk aversion, and out of pocket, while for variables of control consist of demographic characteristics, family medical history, utilization, and satisfaction rate.

Result: The ATP were still below the existing premium, except for active enrolees in class three. The WTP of active enrolees were willing to pay 10% higher above the existing premium, while the WTP of inactive enrolees was 50% lower. In the case of catastrophic illness, WTP increased between 1-3%. Compliance to pay the premium was influenced by a number of factors, expenditure on tobacco and alcohol, willingness to pay, risk averse, catastrophic illness, healthcare utilization, size of household member and patient satisfaction. Surprisingly household member with childbearing and employment both have negative influence toward compliance. Other factors that have positive influence were expenditure on food and non-food, literacy on JKN and type of JKN class enrollment. In achieving an effective access, the gap between the existing premium and ATP WTP should be addressed. The limitation of government budget should lead to a finding alternative source of fund to meet the gap of informal sector financial burden.

Keywords: Ability to pay, willingness to pay, informal sector workers, National Health Insurance

Ind-2306 Exploring Political, Economic, and Social Drivers of Primary Health Care Financing in Indonesia: Challenges, Reforms, and Disparities in Fiscal Space

PRESENTER: **Ms. Likke Prawidya Putri**
AUTHORS: Dina Balabanova, Nouria Brikci, Kara Hanson, Adrianus Hendrawan

Background: Primary Health Care (PHC) in Indonesia has been critical for ensuring affordable healthcare access since the establishment of

Puskesmas in the 1960s. With over 20,000 PHC facilities today, PHC serves as the gatekeeper under the National Health Insurance (NHI) scheme. However, limited funding has hindered optimal PHC performance. Decentralized health governance has resulted in substantial variations in health system outcomes, compounded by disparities in resource distribution and fiscal space at the provincial and district levels. While national-to-local funding transfers exist, districts with low fiscal capacity continue to struggle in financing PHC services. This study explores how political, economic, and social factors have influenced PHC financing reforms and identifies challenges and opportunities for improving funding in districts with diverse fiscal capacities.

Method: This study employed qualitative case study method by systematically reviewing literature and regulations on PHC financing in the last 25 years and interviewing national and sub-national stakeholders. Three districts were included as the study locus, representing very low, low, and high fiscal capacity.

Results: Three key reforms took place that could have resulted in changes in PHC financing: the 2001 decentralization, the 2014 NHI, and the post-pandemic health sector transformation. These reforms directly influenced the funding for PHC through mechanisms such as the establishment of special allocation funds, which finance public PHC (Puskesmas) infrastructure development, or operational assistance fund (BOK) that fund promotional and preventative health strategies implemented by *Puskesmas*. Additionally, they indirectly influenced PHC by devolving authority, allowing PHC managers to innovate and increase budget availability. Political factors appeared to be more dominant compared to economic or social aspects in influencing PHC financing. Politically, the central government, despite decentralization, remains pivotal, contributing over 50% of PHC funding through policies and fiscal instruments. The role of transfers from national government played more significant role in those with very low fiscal capacity. Local political dynamics also shape PHC budgeting, with populist agendas like free healthcare and food supplementary program driving temporary funding increases. Advocacy by academics and civil society has led to long-term reforms, such as health operational assistance and national health insurance; yet, not much influence on local budget allocation. At sub-national level, efforts to achieve a good public finance management has led to an expanded Puskesmas' financial authority, leading to better use of PHC funding. From the economic aspect, the district with high fiscal capacity has more resources for health programs, allowing additional benefit package for its population. The presence of local private sector with a specific agenda could have influenced how PHC are financed at the district level.

Conclusion: This study identified the political, economic, and social factors influencing PHC financing in Indonesia. Despite decentralization, central government funding remains crucial, especially in low-fiscal-capacity districts. Key reforms have shaped financing, but disparities in fiscal space and resource allocation persist, challenging equitable healthcare access.

Ind-501 Factors Affecting Institutionalization of Economic Evidence and Cost-Effectiveness Threshold: A Qualitative Analysis of Policy Processes in Thailand

PRESENTER: **Pitsinee Supapol**
AUTHORS: Chittawan Poonsiri, Siobhan Botwright, Yot Teerawattananon, Nitichen Kittiratchakool, Ms. Wanrudee Isaranuwatchai

Background:

Financing health interventions under universal health coverage presents a significant challenge regarding best use of resources. Economic evaluation can identify interventions providing good value for money, with a cost-effectiveness threshold (CET) often used as a reference for system efficiency or willingness to pay. Institutionalization of economic evidence and a CET in decision-making is influenced by various factors unique to each context, particularly with respect to established formal rules and practice. These factors may evolve over time, with rotation of committee members or policymakers' growing knowledge and understanding of economic evidence and CET. While previous studies have examined factors influencing the institutionalization of Health Technology Assessment (HTA), there remains a gap in research specifically addressing the factors affecting the integration of economic evidence and CET, and many countries employing HTA, particularly in low-income settings, still do not fully integrate economic aspects into their decision processes.

Objective:

This study aims to investigate the factors influencing institutionalization of economic evidence and the CET to inform policymaking, and how this may change over time.

Methods:

This study adopts a qualitative process case study approach, as it enables an in-depth exploration of the complex, context-dependent process of institutionalizing economic evidence and the CET in health policy decision-making. Thailand, with a long history of applying economic evidence and CET in the Universal Coverage Benefit Package (UCBP) and the National List of Essential Medicines (NLEM), was chosen as the focus country to provide a rich longitudinal data, where having two institutional contexts as case studies improves generalizability of findings. Meeting minutes from sub-committee, board, and working group meetings from 2008 to 2023 served as the primary data source. Emerging themes and patterns were identified using thematic approach and iteratively tested for replication logic within-case and cross-case analysis. To improve validity, interviews were employed as a secondary data source, providing triangulation with the insights obtained from meeting minutes.

Results:

Preliminary findings from the review of UCBP meeting minutes indicate that, in the early years, the sub-committee, newly introduced to economic evidence and the CET for health intervention assessment, expressed significant concerns regarding the adaptability of these tools to Thailand's context, as well as the accuracy and completeness of data from economic evaluations. While the sub-committee initially appeared reluctant to rely on the CET, the chair played a pivotal role in encouraging its use. Eventually, the use of economic evaluation and CET has

clearly become an increasingly important aspect of Thailand's HTA process, with the sub-committee choosing to defer decisions when cost-effectiveness evidence was not adequately presented.

Conclusion:

These preliminary findings highlight that policymakers' familiarity with and understanding of economic evidence and the CET are important in institutionalizing these tools. The presence of advocates, including policymakers and pioneers in integrating economic evaluation into the HTA process, also strengthened the institutionalization. As a next step, comparing with experience in other settings will help uncover universally applicable factors that support the effective institutionalization of economic evidence and CET in decision-making.

Ind-843 Association of Multimorbidity on Medical Expenditures Among Older Adults With Cognitive Impairment: A Nationally Representative Study in China

PRESENTER: **ye zhang**, Renmin University

Background: Although the negative impact of cognitive impairment on health status and medical expenditures has been discussed previously, an increasing number of geriatric individuals with cognitive impairment are also suffering from multiple chronic diseases. However, there are limited estimates of medical expenditures for older Chinese adults with cognitive impairment and multimorbidity. This study uniquely contributed to the cognitive impairment literature by investigating mean medical expenditures associated with multimorbidity in total and out-of-pocket medical service categories. **Aim:** This study aimed to compare the medical expenditures of older Chinese adults with cognitive impairment, focusing on those with multimorbidity versus no multimorbidity. The study hypothesised that medical expenditures would be higher among those with both cognitive impairment and multimorbidity versus those without multimorbidity. **Methods**: Using data from the nationally representative Chinese Longitudinal Healthy Longevity Survey in 2018, this study included 3,036 participants aged 60 years and above with cognitive impairment. Cognitive impairment was assessed using the Chinese version of the Mini-Mental State Examination (MMSE). The score of MMSE ranged from 0 to 30, with higher scores indicating better cognitive function. Multimorbidity was defined as the presence of two or more chronic conditions. Nonparametric tests and a two-part model were applied to estimate group differences in total annual medical expenditures and the annual out-of-pocket medical expenditure. Three sensitivity analyses were conducted to assess the robustness of the results. **Results:** Descriptive analysis showed that multimorbidity was significantly associated with all personal characteristics ($p< 0.05$) except for the number of children ($p = 0.379$). Participants with multimorbidity had 122.2% greater total medical expenditures ($\beta = 0.80$, $p< 0.05$) and 90.3% greater out-of-pocket expenditures ($\beta = 0.64$, $p< 0.05$) compared with those without multimorbidity. All three sensitivity analysis proved the robustness of the results. Firstly, after excluding observations with 'unable to answer' on any MMSE items, medical expenditures were 134.0% and 99.3% greater in the multimorbidity group than in the no multimorbidity group for total and OOPE, respectively ($\beta = 0.85$, $p< 0.001$; $\beta = 0.69$, $p< 0.001$, respectively). Secondly, when using a stricter MMSE score to identify cognitive impairment, total medical expenditures increased by 154.8% ($\beta = 0.94$, $p< 0.001$), as was the case with OOPE increased by 122.6% ($\beta = 0.80$, $p< 0.001$). Thirdly, after imputing missing data on medical expenditures, total expenditures were 122.6% greater ($\beta = 0.80$, $p< 0.001$), and OOPE were 96.1% higher ($\beta = 0.67$, $p< 0.001$). **Conclusions:** This study found greater medical expenditures among older Chinese adults with cognitive impairment and multimorbidity, which captured the substantial financial burden of multiple chronic conditions in this population. This study highlights the need to design strategies and treatments for better chronic disease management in older population. **Keywords:** Cognitive impairment, Multimorbidity, Medical expenditure, Older adults

Ind-1570 Impacts of DRG Prospective Payment System on the Quality of Healthcare: Evidence From a Quasi-Experimental Analysis in Beijing, China

PRESENTER: **zhen cao**
AUTHORS: Zhongjun Guan, Moning Guo

Background： The DRG prospective payment system（DRG-PPS）is widely used around the world as an effective means of incentivizing healthcare providers to improve efficiency and control costs. However, previous studies have found uncertainty in the impact of DRG-PPS on healthcare quality. Chinese public hospitals derive their income mainly from health insurance funds, so they are vulnerable to the financial incentives created by payment reform. Moreover, high-quality empirical studies are concentrated in high-income countries. with limited evidence available for low- and middle-income countries. **Objective:** Exploring the impact of the DRG-PPS on the quality of healthcare, providing empirical evidence for the improvement of the payment system. **Methods:** Taking advantage of the exogenous shock of implementing the DRG-PPS based on the inpatient case home page and outpatient electronic medical record data of patients with neurological disorders in Beijing, we analyzed the impact of the DRG-PPS on the quality of healthcare by using the difference in difference method. We examined the trend of changes in healthcare quality indicators in the period before the policy implementation by utilizing the event analysis method. Given that the DRG-PPS might differentially affect patients undergoing various diagnosis and treatment methods, it is imperative to delve deeper into the variations in healthcare quality within surgery and internal medicine before and following the policy's implementation. Furthermore, an additional analysis was performed to examine the correlation between the decrease in medical resource consumption during the study and the propensity to admit patients with mild conditions identified. **Results:** DRG-PPS has had a positive impact on the improvement of the quality and efficiency of healthcare services, with a 12.6% decrease in the average hospitalization expenses and a 0.96-day reduction in the average length of stay, while at the same time, it has led to a significant decrease in the hospitalized mortality by 0.31 percentage points and a substantial reduction in the 30-day readmission rate by 3.04 percentage points. However, concurrently, the DRG-PPS has also occasioned a decline in the case-mix index across all disease group categories. Notably, there has been a specific decrease in the percentage of surgical patients within the surgical disease group. This observation partially substantiates the strategic behavior of hospitals, which may be engaging in patient selection following the payment reform. In addition, the DRG-PPS caused an increase in the 30-day post-discharge re-admission rate, and hospitals have a tendency to transfer the cost of healthcare to outpatient clinics. **Conclusion:** DRG-PPS demonstrates substantial effects in restraining cost escalation and enhancing quality. Nevertheless, caution must be exercised to mitigate potential issues such as patient selection bias and upcoding. **Keywords** DRG, prospective payment, Healthcare, Quality, China

Bali International Convention Centre – Surabaya

Mental Health, Disability, Rehabilitation and the Care of Elderly

MODERATOR: **Matthew Franklin**, University of Sheffield

Ind-74 Stepped, Evidence-Based and Integrated Care for Severe Mental Illness: A Health Economic Evaluation of the RECOVER Trial for People with SMI

PRESENTER: **Léon Gerardo Kreis**, "University Medical Center Hamburg-Eppendorf, Department of Health Economics and Health Services Research"
AUTHORS: Anja Rohenkohl, Holger Schulz, Daniel Lüdecke, Hans-Helmut König, Christian Brettschneider, Jürgen Gallinat, Anne Karow, Antonia Zapf, Martin Lambert

Background: The goal of the stepped, evidence-based and integrated RECOVER care service model is to improve quality and efficiency of care for people with mental disorders by optimized cross-sector coordination, as well as systematic and evidence-based additions to the care system. One approach is to divide care services by illness severity, by which the RECOVER care model should allocate healthcare services adequately and efficiently, in order to achieve cost savings at care of equal or higher quality. This work focuses on people with a severe mental illness (SMI), representing levels 3 and 4 in the RECOVER model.

An SMI can cause serious functional impairments and significantly restrict important daily activities. The stepped interventions in RECOVER consisted of overarching programs (such as social work, supported employment, peer support) and additionally included case management, (group) psychotherapy, and pharmacotherapy (level 3), or Assertive Community Treatment including psychotherapy and pharmacotherapy (level 4). This work represents the health economic evaluation of the RECOVER care service model for persons with an SMI from a societal perspective.

Methods: Direct and indirect costs were determined based on the information provided by the trial participants on the uptake of healthcare services and productivity losses. Using this data, we compared costs between RECOVER and usual care during the 12-months follow-up, and assessed cost-effectiveness of RECOVER from a societal perspective.

Cost differences between RECOVER and usual care were estimated using GLM regressions with a log-link function, whereby a Poisson distribution was assumed. To analyze the cost-effectiveness, quality-adjusted life years (QALYs) were determined using the EQ-5D-5L. QALY differences between RECOVER and usual care were estimated using linear regressions. The incremental cost-effectiveness-ratio was calculated and uncertainty was assessed by estimating cost-effectiveness acceptability curves with net monetary benefit regressions. Scenario analyses considering a healthcare payer perspective and different patient-reported outcome measures were conducted.

Results: 506 patients with SMI (RECOVER: 252, usual care: 254) were included. Total societal costs over the 12-months follow-up period in RECOVER were significantly reduced compared to usual care (23,828€ vs. 30,443€, $p<0.001$). Cost savings were mainly attributable to lower inpatient costs (7,400€ vs. 13,782€, $p<0.001$), while costs for outpatient and psychotherapy services were significantly higher in the RECOVER model compared to usual care (4,650€ vs. 3,057€, $p<0.001$).

The cost-effectiveness analysis showed that the RECOVER interventions were associated with 0.02 QALY (n.s.) more than usual care, resulting in RECOVER dominating usual care. For all assumed willingness-to-pay thresholds between €0/QALY and €250,000/QALY, RECOVER yielded cost-effectiveness probabilities greater than 99%. Scenario analyses showed robustness of results.

Conclusion: The presented results of this study show considerable potential for increasing efficiency in the care of people with SMI, suggesting that the RECOVER service care model could be a cost-saving extension to usual care. These savings arise primarily from a shift in utilization from the inpatient to the outpatient sector, whereby the quality of life of those affected does not deteriorate.

Ind-792 Evaluating the Economic Costs of Common Mental Health Disorders in Ghana: A Case Study of Patients and Their Caregivers From two District Hospitals.

PRESENTER: **Mansoora Baidoo**
AUTHORS: Prince Boakye Frimpong, Jacob Novignon

Abstract

Introduction

About 2.3 million people in Ghana are estimated to be living with mental disorders (MDs), yet only 2% of them receive allopathic psychiatric treatment. The economic burden of MDs can be substantial given the reduced functionality associated with such conditions. Regrettably, these potentially extensive and long-lasting economic burdens are frequently disregarded. This study seeks to estimate the economic and financial costs of common MDs to patients and their main caregivers in two selected district hospitals in Ghana.

Methods

This study used a cost-of-illness approach to measure the economic and financial costs of MDs. Cross-sectional data was collected from 88

patients diagnosed with common MDs at the Ejisu and Effiduase district hospitals and their caregivers. Economic costs were divided into direct and indirect costs. Direct costs were further divided into medical and non-medical costs. Medical costs covered expenses on drugs, injections, diagnostic/laboratory tests, consultations, psychotherapy/counselling, and admission. Non-medical costs included the cost of food, transportation, accommodation, rituals/prayers, and miscellaneous. Indirect costs were estimated as the value of MD-related productive time losses for patients and their caregivers, using the human capital approach. These were calculated by multiplying the number of workdays a respondent is absent from work due to the condition by his/her reported wage rate, if employed, or by the national daily minimum wage, if unemployed. Additionally, intangible costs associated with MDs were assessed using a Likert's scale to rate the extent of the non-quantifiable welfare losses endured by patients and their caregivers under five themes: (i) stigmatisation, (ii) emotional distress, (iii) functional disability, (iv) loss of leisure, and (v) social relationship.

Results

The average annual cost of MDs in Ghana was valued at US$841.04 (GHS 9,259.85) per patient, with direct and indirect costs constituting US$323.09 (38.42%) and US$517.95 (61.58%), respectively. The highest direct cost components were drugs and injections with an average annual cost of US$141.85 (43.91%), followed by admission (22.71%), and transportation costs (13.43%). The value of patients' productive time lost due to unemployment was the greatest indirect cost component (38.08%), followed by the value of workdays lost to caregiving activities (17.54%). The average annual productive time lost by employed patients and caregivers was 41 and 32 workdays, respectively. The highest rated intangible cost for caregivers was emotional distress, while patients mostly reported stigmatisation and emotional distress as their key intangible costs.

Conclusion

These findings suggest that MDs have a high economic burden, with indirect costs accounting for a larger share of the total economic cost. They also highlight the need for interventions to lessen the burden on patients and their caregivers. These include improving and expanding mental healthcare resources, financial protection strategies to remove barriers to care, as well as raising awareness through anti-discrimination campaigns in Ghana.

Ind-614 Modelling Major Depressive Disorder Using the Validated SiMMDep Platform: Using Economic Analysis to Develop Clinical Pathways

PRESENTER: **Prof. Stirling Bryan**, University of British Columbia
AUTHORS: Shahzad Ghanbarian, Louisa Edwards

Background: Major depressive disorder (MDD) is a prevalent and recurrent condition associated with high levels of morbidity and substantial healthcare and societal costs. As a tool to support rapid evaluation of new treatments and interventions for MDD, we developed the Simulation Model of Major Depression (SiMMDep) platform, a validated individual-level simulation model of MDD care pathways in Canada.

Pharmacological therapy is often first-line treatment in MDD. However, most patients require multiple trials of medication to find one that is both effective and does not cause intolerable side effects. Pharmacogenomic (PGx) testing is a promising intervention that uses targeted genomic information to guide prescribing decisions, potentially reducing this trial-and-error process, improving patient outcomes and reducing care delivery costs.

Existing evidence points to the cost-effectiveness of PGx in the context of MDD, but the positioning of testing in the clinical pathway (e.g., testing at diagnosis or after "failing" one or more medications) has not been investigated. Our research addresses this question: For patients with MDD, where in the care pathway should PGx testing be positioned to maximize efficiency? This paper provides a rare example of model-based economic analysis to support the development of clinical care pathways, specifically focusing on the optimal positioning of a new test within the MDD treatment pathway.

Methods: We used the SiMMDep platform to conduct a probabilistic analysis assessing the effectiveness and cost-effectiveness of PGx testing for patients with a new moderate or severe MDD episode. This analysis was conducted from the public payer's perspective over a 20-year horizon. The model included a cohort (N = 194,149; mean age = 46 years) of both newly diagnosed and prevalent MDD patients. All clinical pathways modelled included use of PGx testing but varied in when testing was considered: 1) before first antidepressant, or 2) after "failing" one medication. The analysis estimated incremental costs, life-years (LYs), and quality-adjusted life-years (QALYs) for a representative MDD cohort in British Columbia (BC), Canada.

Results: We conducted a probabilistic analysis across selected variables, demonstrating that the pre-prescription strategy was cost-saving compared to the strategy of prescribing after "failing" one medication over a 20-year horizon. The pre-prescription approach resulted in an average incremental cost of $7.5 million, yielding 644 additional QALYs and 76 LYs.

Significant cost savings were identified for public healthcare payers, with $9.9 million saved on managing refractory MDD and $1.1 million saved on psychotherapy costs. These savings were driven by earlier access to more effective pharmacotherapy, which reduced reliance on more resource-intensive treatment options.

Conclusions: By re-using a robust and validated model, we were able rapidly to generate high-quality, evidence-based insights that support development of care delivery for patients with MDD in Canada. By providing PGx testing prior to initiating pharmacotherapy, we showed major cost-savings to the BC health system and improved patient benefits compared to waiting for one unsuccessful antidepressant trial. Exploring the broader implications of PGx testing using SiMMDep enables policymakers to evaluate its impact under different implementation strategies.

Ind-479 Effects of a Coordinated Post-Stroke Care Program (StroCare) on Healthcare Costs of Stroke Patients at 12-Months Follow-up

PRESENTER: **Andreas Beisel**

AUTHORS: Hans-Helmut König, Martin Härter, Lena Seibel, Stefan Boskamp, Michael Rosenkranz, Holger Schmidt, Götz Thomalla, Judith Dams

Introduction: Stroke is a leading cause of death and disability and imposes a high economic burden on public healthcare systems, largely due to expensive inpatient stays and post-stroke care. Although timely rehabilitation and interdisciplinary post-stroke care are essential for optimal recovery and cost reduction, many stroke patients in Germany face rehabilitation delays and barriers between healthcare sectors. The StroCare intervention provides a coordinated outpatient program to control risk factors after stroke. Moreover, it includes case managers and an electronic rehabilitation portal to improve interdisciplinary communication. The aim of this study was to evaluate whether StroCare reduces healthcare costs from the payer perspective.

Methods: Patients insured with the BARMER statutory health insurance were recruited from 01/2020 to 09/2022 in a multicenter trial in Germany. To assess health care utilization and costs, health insurance claims data were used to compare the intervention group with a usual care control group. Additionally, a historical control group was compiled from claims data. Inclusion was mainly based on stroke diagnosis and the absence of pre-existing dementia or disability. Adopting a German healthcare payer perspective, outcomes were inpatient hospital costs, care costs and total healthcare costs within a 12-month follow-up period after the initial hospitalization. Sensitivity analyses included winsorization and calculation of costs per day lived to account for cost outliers and mortality. As randomization was not possible, entropy balancing was applied to account for imbalances in sociodemographic and clinical parameters between groups. Weighted gamma and two-part models were applied. Significance was set at $p < 0.025$ with Bonferroni corrections.

Results: Compared to the usual care control group (n = 208), the intervention group (n = 186) caused 1799€ lower care costs (p = 0.006). Similarly, the intervention group caused 1897€ lower care costs than the historical control group (n = 2010; p = 0.000). No significant differences were observed for inpatient hospital costs and total healthcare costs. After calculating the costs per day lived, the difference between the intervention and usual care control group in terms of care costs was no longer significant.

Conclusion: Evidence suggests that StroCare was associated with lower care costs within 12 months after the initial stroke, although these results may be influenced by mortality. However, the long-term effects of StroCare beyond 12 months are not known yet and should be evaluated when data become available.

Ind-1216 Cost-Effectiveness Analysis of an Enhanced Recovery After Surgery (ERAS) Process After an Elective Minimally Invasive Heart Valve Surgery

PRESENTER: **Rebecca Thiel**

AUTHORS: Evaldas Girdauskas, Hans-Helmut König, Christian Brettschneider

Abstract

BACKGROUND:

Enhanced Recovery After Surgery (ERAS) programs are a multidisciplinary approach with the objective of optimizing the preoperative, intraoperative and postoperative recovery period. The implementation of ERAS demonstrated the ability to reduce hospital costs while concurrently improving health outcomes across various surgical specialties. Evaluations of ERAS in minimally invasive heart valve surgery are scarce. This study provides a cost-effectiveness analysis from a societal perspective.

METHODS:

This study is part of a bicentric cluster-randomized controlled trial, *INCREASE*, which was conducted in Germany. All participants underwent elective minimally invasive heart valve surgery, involving either the mitral or the aortic valve. The intervention group received the ERAS program, which included early extubation, intensive postoperative mobilization, and discharge approximately on the fifth postoperative day with rehabilitation scheduled thereafter. The control group received the standard of care.

Costs were assessed by hospital charges, additional costs associated with the intervention, health care utilization within one year postoperatively and the indirect costs resulting from productivity losses. The effect was analyzed in terms of quality-adjusted life years (QALYs). Both, costs and effects were valued using specific German value sets. An incremental cost-effectiveness ratio (ICER) and a cost-effectiveness acceptability curve (CEAC) were calculated by estimating a series of net-monetary benefit regressions.

RESULTS:

A total of 190 participants were recruited and analyzed, with 97 assigned to the control group and 93 to the intervention group. The intervention group exhibited higher costs (115€ (SE: 3237)) and additional effects (+ 0.017 QALY (SE: 0.02)) compared to the control group, these differences were not statistically significant. ERAS resulted in an ICER of 6,855 €/QALY. The intervention group had significant lower costs during the initial hospitalization (-2,937€ (SE:1,417) p-value:0.04). The CEAC indicated a 72% probability of cost-effectiveness at the 150,000€/QALY willingness-to-pay threshold.

DISCUSSION/ CONCLUSION

Although the ERAS program resulted in reduced costs for the initial surgery and hospitalization in comparison to the standard of care, the CEAC revealed that the probability of cost-effectiveness of ERAS-based elective minimal invasive heart valve surgery is moderate. Additional probabilistic sensitivity analyses demonstrated that the results were consistent across subgroups. Nevertheless, ERAS improved the quality of life while reducing hospital costs and length of hospitalization after valve surgery. The evidence is constrained by a small sample size, which was mostly male (74%). Therefore, further research is needed.

Ind-1401 An Economic Evaluation of Bimodal Cochlear Implantations Compared to Unilateral and Bilateral Cochlear Implantation among Adults in Australia

PRESENTER: **Mohammad Nure Alam**

AUTHORS: Bamini Gopinath, Yvonne Tran, Mutsa Mutowo, Kompal Sinha

Objective: Bimodal stimulation (BMS), combining a cochlear implant (CI) in one ear and a hearing aid (HA) in the contralateral ear, is increasingly used in adults with bilateral severe to profound sensorineural hearing loss (SNHL). Existing evaluations are limited by a lack of primary, patient-level utility data. This study tackles this knowledge gap by assessing the cost-effectiveness of bimodal stimulation versus unilateral cochlear implant and sequential bilateral cochlear implants using primary health utility data.

Methods: A Markov state-transition model was used to estimate costs and quality-adjusted life years (QALYs) over a lifetime horizon from the Australian healthcare system perspective. Utilities were assessed using the Health Utilities Index (HUI) Mark III. Resource utilization was based on expert-informed clinical pathways and costs sourced from the Medical Benefits Schedule (MBS) and Australian Refined Diagnosis Related Groups (AR-DRG) schedules.

Results: Total lifetime costs were $59,659 for unilateral cochlear implant, $64,691 for bimodal stimulation, and $116,684 for sequential bilateral cochlear implants. QALYs were 4.48 (unilateral cochlear implant), 4.63 (bimodal stimulation), and 4.72 (sequential bilateral cochlear implants). Compared with unilateral cochlear implant, bimodal stimulation yielded an incremental cost of $5,032 and a QALY gain of 0.15, resulting in an ICER of $34,753 per QALY. Bimodal stimulation was cost-saving versus unilateral cochlear implant. Scenario and sensitivity analyses confirmed the robustness of the findings.

Conclusion: Bimodal stimulation is a cost-effective strategy for adults with bilateral severe to profound sensorineural hearing loss who received hearing interventions and had residual hearing in the non-surgical ear.

Ind-2045 How Much Does It Cost to Care for Older Persons in Hong Kong? Estimation of Informal Caregivers' Time Costs, Out-of-Pocket Expenses, and Income Loss

PRESENTER: **Xingnan Yi**

AUTHORS: Xuechen Xiong, Vivian Lou, Jianchao Quan

Background With global aging accelerating, informal caregiving has become essential in meeting long-term care needs for older adults. In Hong Kong, the proportion of individuals aged 65 and above increased from 13.3% in 2011 to 19.6% in 2021, placing significant pressure on formal healthcare systems. Informal caregiving, provided by family members or friends without payments, addresses these gaps but imposes substantial burdens on caregivers. While previous research has often focused on psychological impacts on caregivers, financial and time costs remain underexplored. This study estimates both the direct and indirect costs of informal caregiving for older adults in Hong Kong, offering insights relevant to resource allocation in aging societies.

Methods We conducted a survey of 2,284 informal caregivers between December 2023 and June 2024. Eligible participants were Hong Kong residents providing at least six hours of care per week to a family member aged 60 or above. Of respondents, 61% were female, and 26% provided more than 44 hours of care weekly. Costs were reported across three categories: (1) time costs (opportunity costs of foregone activities); (2) out-of-pocket (OOP) expenses; and (3) income loss due to productivity impairment. Time costs were calculated via the opportunity cost method. Caregivers redistributed their weekly caregiving hours into paid work, unpaid work, and leisure (excluding sleep). These proportions were applied to their total caregiving hours to estimate forgone time. Paid work time was valued using median wage by gender and age. For those not formally employed, Hong Kong's statutory minimum wage (HKD 42/hour) was used. Time lost to unpaid work and leisure was valued at 35% of the assigned wage rate. OOP included spending on medical items, daily supplies, direct financial transfers to care recipients, and caregivers' own healthcare costs due to caregiving-related physical or psychological strain. Income loss was estimated by assessing productivity impairment. Caregivers rated how caregiving affected their work on a 0-10 scale, converted into a proportional work loss. This proportion was multiplied by weekly work hours and corresponding wage to estimate annual lost income.

Results The total annual cost of informal caregiving in Hong Kong is estimated at USD 4.72 billion (1.2% of 2024 GDP). Time costs comprised 43.8% of the total (USD 6,447 per caregiver/year), with the largest share from paid work (USD 3,190), followed by leisure (USD 3,053) and unpaid work (USD 204). On average, caregivers reported they would reallocate 62.9% of caregiving time to leisure, 32.9% to paid work, and 4.2% to unpaid work if caregiving duties were removed. OOP expenses made up 39.5% of total cost (USD 5,810 per caregiver/year). Among caregivers, 68% incurred caregiving-related spending (USD 3,614), while 36% reported health-related expenses due to caregiving (USD 2,196). Productivity impairment affected 43% of caregivers, leading to USD 2,454 per caregiver/year in lost income (16.7% of total cost).

Conclusions Informal caregiving imposes a substantial economic burden, primarily through unpaid time. These hidden costs warrant recognition in policy. Financial subsidies, workplace support, and accessible respite services could help ease caregiver strain. This study's comprehensive costing framework supports evidence-based decision-making in Hong Kong and other aging societies.

Ind-2714 Cost-Effectiveness of Hearing Aids in Supporting Cognitive Function in Older Adults at Risk of Dementia: An Economic Evaluation of The HearCog Trial

PRESENTER: **Marshall Makate**, Curtin University

Background and Motivation

Hearing loss is a major global health issue, currently the second leading cause of disability worldwide, affecting an estimated 1.5 billion individuals—90% of whom experience age-related hearing loss. The Lancet Commission on Dementia Prevention identifies hearing loss as a key modifiable risk factor, contributing to 8% of preventable dementia cases. Modelling studies suggest that delaying dementia onset by just two years could reduce its prevalence by 13%, significantly easing associated health and economic burdens. While epidemiological evidence has established an association between hearing loss and cognitive decline, trial-based evidence on the cost-effectiveness of hearing interventions remains limited. This study evaluates the cost-effectiveness of hearing aids in improving health-related quality of life (HRQoL) and reducing healthcare resource use, based on a randomised controlled trial (RCT) conducted in Western Australia involving older adults with mild cognitive impairment and hearing loss. The analysis is conducted from a health system perspective.

Data and Methods

A two-arm, parallel-group RCT was conducted with 180 participants aged 70 years and older, all with audiometrically confirmed hearing loss and mild cognitive impairment. Participants were randomised to receive either immediate hearing aid fitting (intervention) or delayed intervention after 12 months (control). HRQoL was assessed using the Short Form-12 (SF-12), with utility values derived via the SF-6D to estimate quality-adjusted life years (QALYs). Healthcare utilisation was captured via a validated patient-reported resource use questionnaire covering hospital admissions, medical consultations, medication use, procedures, and related costs. Changes in QALYs and healthcare use over time were analysed using multilevel mixed-effects models, accounting for within- and between-group variation.

Preliminary Results

At 12 months, participants in the intervention group demonstrated a mean QALY of 0.799 (95% CI: 0.780–0.819), up from a six-month baseline of 0.397 (95% CI: 0.388–0.407). In comparison, the control group (not yet treated) reported a 12-month mean QALY of 0.832 (95% CI: 0.815–0.850), up from 0.415 (95% CI: 0.406–0.423) at six months. These findings reflect the stepped-wedge design of the trial, where the control group had not yet received the intervention. Preliminary resource use data indicate that the intervention group reported fewer healthcare encounters related to cognitive and mental health, suggesting a potential reduction in health service demand.

Conclusion

Early findings suggest that hearing aid use may improve health-related quality of life and reduce healthcare utilisation among older adults with mild cognitive impairment. Preliminary cost-utility analysis supports the potential for hearing aids to form part of effective dementia prevention strategies. Further analysis will provide a more definitive assessment of cost-effectiveness from a health system perspective.

Ind-2062 A Global Systematic Review and Critique of Economic Evaluation Methods for Accessing Quality Post-Injury Care for Injured Persons

PRESENTER: **Francis Kwame Salman**

AUTHORS: Lungiswa Nkonki, Laura Bojke, Kathryn Chu, Janet Ncube, Justine Davies

Introduction Injuries are leading cause of mortality and rank among the top ten causes of Disability-Adjusted Life Years globally, particularly affecting adolescents aged 10–24 years. The associated economic losses are also significant, with estimates ranging from $245-261 billion in low to middle-income countries alone. Economic evaluations of injury care interventions can help policymakers make informed decisions on the most cost-effective interventions that reduce mortality, morbidity, and the associated costs and economic losses. **Research question and aim** Does the existing evidence of injury care meet healthcare decision-making requirements? We aim to identify and provide a narrative summary of the methods used in economic evaluations of injury care and assess whether the current evidence meets the needs of decision markers. **Methods** The systematic review was conducted and reported following the PRISMA guidelines, 2020. The protocol is registered with PROSPERO (CRD42022351978) and has received ethics exemption from the Stellenbosch University's Health Research Ethics Committee (X22/06/016). We searched the NHS EED, Cochrane, Paediatric Economic Evaluation Database, PubMed, the Cost-Effectiveness Analysis Registry and Scopus for full economic evaluation studies that met our inclusion criteria. We assessed whether the included studies were full economic evaluations that considered all available effectiveness evidence, estimated both costs and effects for various alternative interventions, and incorporate an appropriate time horizon. **Results** Our search strategy yielded 16 249 unique records that were independently screened. A total of 358 studies were assessed for eligibility through full text review and 259 studies were included in the systematic review. Most of the studies (92%) were conducted in high income countries and almost exclusively focused on receiving definitive care (93% vs 1% reaching care and 6% receiving long term rehabilitative care). We also found that only half of the included studies (51%) met the full set of criteria evaluated. Of the studies that fell short, 34% did not appropriately synthesize all available evidence, 2% failed to consider costs and outcomes over an appropriate time horizon and 14% of the studies failed to both synthesize effectiveness evidence and consider costs and outcomes over an appropriate time horizon. We also found that studies undertaken in low- and middle income countries were far less likely to meet the full criteria (75% did not meet the full criteria compared to 48% in high income countries). **Conclusion** Our review showed that half of the existing economic evidence on injury care falls short of the requirements needed to effectively inform policy and practice. Inadequate effectiveness evidence synthesis and inappropriate time horizons are the most common limitations. We believe that improving the methodological rigor of economic evaluations of injury care is essential to ensure that injury care is not only clinically effective but also offers good value for money - this is particularly the case for low- and middle-income countries and underrepresented phases of the injury care pathway.

Bali International Convention Centre – Hibiscus

Economic and Health Impact of Health Policies

MODERATOR: **Eva Pascoal**,

Ind-217 Uncover the Role of Early HTA in the Healthcare Innovation Ecosystem

PRESENTER: **Qi Gao**
AUTHORS: Yot Teerawattananon, Alec Morton, Yi Wang

Background

Early health technology assessment (eHTA) provides critical insights through comprehensive health and economic evaluations, informing development and investment strategies for innovative healthcare solutions. Despite positive qualitative feedback from stakeholders, empirical quantification of its long-term benefits and the mechanisms by which these benefits emerge is limited. This study addresses this gap by using mathematical modelling to evaluate the value of eHTA within healthcare innovation ecosystems.

Objectives

This work aims to (1) quantify the benefits of eHTA compared to its absence, (2) elucidate how eHTA impacts stakeholder interactions and decisions, and (3) evaluate its effects on ecosystem efficiency and societal welfare.

Methods

We developed an evolutionary game model based on the innovation ecosystem framework, involving three key stakeholders: healthcare payers, innovation funders, and innovators. These players make strategic decisions regarding further development of healthcare innovations, with two scenarios tested—one with eHTA information and one without. Healthcare payers decide whether to provide monetary incentives or policy benefit to funders; funders decide whether to invest in the technology; and innovators decide whether to continue or quit further development, with payoffs determined by the technology's health and commercial potential. We identified the evolutionary stable strategy (ESS) for each player under different scenarios. Numerical simulations were conducted to illustrate how eHTA affects stakeholders' decisions and ecosystem efficiency over time.

Results

Under the scenario where eHTA is absent, the game outcomes vary depending on the technology's value proposition. When commercial value is high, investment and development proceed consistently, while healthcare payers only provide incentives when health value is also high. When the commercial value of the product is low, all players choose not to proceed: healthcare payers withhold incentives, funders withdraw investment consideration, and innovators quit further development, regardless of health value. Economic value drives product development more strongly than health value, making innovations with high public health benefits but low commercial viability less likely to proceed. Although the involvement of eHTA does not alter equilibrium outcomes, it accelerates the convergence to stable strategies, enhancing ecosystem efficiency when equilibrium aligns with social optimality. The impact of eHTA on ecosystem efficiency increases when implemented in earlier R&D stages. However, when equilibrium diverges from social optimum, strategic disclosure of eHTA information becomes crucial for welfare enhancement. From a social welfare perspective, eHTA mitigates welfare loss through optimization of innovators' R&D strategies and process improvements for all players.

Conclusion

Integrating eHTA into product development cycle can benefit both enterprise growth and social development. This study underscores the need for frameworks that optimize eHTA timing and deployment, along with policies to incentivize health-oriented innovation. Further work is needed to explore stochastic elements and parameter uncertainty to refine these insights.

Ind-1915 Indonesia Health Systems Transformation: Impact on Health Equity and Way Forward

PRESENTER: **Tiara Marthias**, Universitas Gadjah Mada
AUTHORS: Sensa Gudya, Ms. Likke Prawidya Putri

While Indonesia is embarking on health systems transformation, there is a need to assess how these changes translate into more equitable access to quality health services, particularly at the primary care level and subsequently, referral services that are currently inequitably utilised only by the more privileged segments of the population. These include people living in urban areas, large cities with adequate access to secondary and tertiary health facilities, those with economic and social capital to utilise quality health services.

This research provides an overview of Indonesia's recent health system transformation, with a focus on the implementation of universal health coverage (UHC) through the **Jaminan Kesehatan Nasional (JKN)** initiative. Utilizing data from multi-year national surveys and claims data, this study evaluates progress toward equitable access to primary health services across the country.

A **difference-in-differences (DiD)** approach is applied to assess disparities in health service utilization before and after the introduction of

JKN, disaggregated by socioeconomic, geographic, and demographic factors. Additionally, **concentration indices** are used to measure and visualize the distribution of health care access, highlighting potential inequities across income groups, geographical areas, types of JKN membership, and other vulnerable population groups.

The findings reveal progress toward the attainment of UHC in Indonesia, with notable increases in primary and secondary care utilization among certain population groups. However, persistent inequities remain, disproportionately affecting rural populations, low-income families, and marginalized groups. Structural barriers, such as geographic inaccessibility, insufficient health workforce distribution, and administrative complexities within the JKN scheme, exacerbate these inequities.

Policy recommendations include the redesign of capitation-based payments to incentivize providers in underserved areas, investment in primary healthcare infrastructure, and targeted subsidies for the poorest households. Emphasis is also placed on addressing inefficiencies in service delivery to optimize resource use and improve health outcomes.

This study contributes to the growing body of evidence on the health equity impacts of UHC reforms in low- and middle-income countries, with insights from this research hoped to inform equitable health policy development in Indonesia and beyond.

Ind-2313 Macroeconomic Impacts of Sugar-Sweetened Beverage Taxation in Brazil: A Computable General Equilibrium Model Analysis

PRESENTER: **Larissa Barbosa Cardoso**, UNIVERSIDADE FEDERAL DE GOIAS
AUTHORS: Auberth Verson, Maria Victória Garcia Rosa, Kênia Barreiro de Souza, Flaviane Souza Santiago

Background: The consumption of sugar-sweetened beverages (SSBs) is on the rise globally, particularly in developing countries. While the health benefits of SSB taxation are well-documented, the macroeconomic implications of such policies warrant further exploration. Concerns over potential negative economic impacts, such as reduced production and employment, are often raised as objections. Existing studies frequently provide only partial analyses or overlook substitution effects in the economy. **Objectives**: This study aims to assess the economy-wide impacts of SSB taxation in Brazil over the short and long term, using a modeling approach. **Methods**: A national dynamic Computable General Equilibrium (CGE) model was employed, calibrated for the Brazilian economy using the 2015 input-output matrix from the Brazilian Institute of Geography and Statistics (IBGE). The analysis covered four taxation scenarios applied to the SSB sector for the period 2023–2032: Scenario 1 (SC1): Increase of 10 percentage points (p.p.) in the taxation of the sector from 2023; Scenario 2 (SC2): Increase of 20 p.p. in the taxation of the sector from 2023; Scenario 3 (SC3): Increase of 30 p.p. in the taxation of the sector from 2023; and Scenario 4 (SC4): Gradual increase from 10 to 30 p.p. in the taxation of the sector between the years 2023 and 2025. Each scenario was simulated under two assumptions: (i) no changes in government spending, and (ii) increased government spending in the Public Health sector, funded entirely by the revenue generated from SSB taxation. **Results**: With no changes in government spending, SSB prices increased across all scenarios (ranging from 7.61% in SC1 and 23.11% in SC3, respectively,), leading to a decline in household SSB consumption (from -3,74% in 2025 to -4,20% in 2032). The SSB sector experienced a decrease in economic activity, with reductions in production (-2.08% in SC1) and employment level (-4,32% in SC1). Negative macroeconomic effects were observed in the short term, including declines in employment (-0,08%), and GDP (-0,06%) in SC1. However, these effects were mitigated over time, with employment returning to positive levels by the end of the simulation period. When tax revenue was reinvested in the Public Health sector, the negative macroeconomic impacts were largely reversed, with minimal changes to the intended reductions in SSB consumption. Furthermore, the gradual implementation of tax increases (SC4) showed slightly less disruptive effects on economic indicators compared to immediate tax hikes, making it a potentially more favorable approach for minimizing short-term economic disruptions. **Conclusion:** The findings demonstrate the effectiveness of SSB taxation in achieving its primary goal of reducing consumption while highlighting manageable economic impacts. Reinvestment of tax revenues into public spending plays a key role in mitigating short-term macroeconomic drawbacks. A gradual tax increase strategy may offer additional advantages by balancing public health goals with economic stability.

Ind-2532 Evaluating the Impact of Health Workforce on Mortality : A Panel Data Analysis across Income Groups

PRESENTER: **Xinpeng Xu**
AUTHORS: Bangaman Akani, Ziwei He, Owen Fei, Yanfang Su, Novil Wijesekara, Wu Zeng, Huihui Wang

Abstract

Background: Reducing maternal mortality rates (MMR), under-five mortality rates (U5MR), and infant mortality rates (IMR) is pivotal for global health initiatives, notably the Sustainable Development Goals (SDGs). Investment in human resources for health (HRH) plays a crucial role in improving health outcomes. Despite previous studies exploring the impact of HRH on mortality rates, the potential for bias in prior cross-sectional analyses has been a concern. This study leverages panel data to reassess and explore potential heterogeneity in the relationship between HRH and mortality rates. **Methods:** We utilized panel data from 2013 and 2018 comprised of mortality rate outcomes, HRH density indicators, and control variables. Data were sourced from World Development Indicators and National Health Workforce Accounts. We applied fixed- and random-effect linear models with log transforms to examine impacts globally and by country income groups. **Findings:** Medical doctor (MD) density and Nurse density had varied impacts on mortality measures. For MMR, MD density and the MD/Nurse ratio had significant respective elasticities of -0.098 (P=0.016) and 0.075 (P=0.003) globally. Lower-middle income countries (LMIC) displayed the strongest impact, wherein if the MD/nurse ratio increased 50% the MMR would lower by 5.5%. For IMR, HRH measures were not statistically impactful, except for the MD/Nurse ratio in upper-middle income countries (UMIC), with an elasticity of 0.037 (**P=0.026**). For U5MR, total HRH density had significant impact in both LIC and LMIC, with MD density and the MD/Nurse ratio impactful in LIC and Nurse density impactful in LMIC. HIC data suggested an over-emphasis on MD vs. Nurse density. **Interpretation:** These findings underscore differentiated roles of MDs and nurses in addressing mortality, and imply context-specific strategies for investing in HRH. Investing in MDs would reduce

global MMR, with the largest gains in LMICs, and reduce U5MR in LICs. Investing in nurses could reduce IMR in UMICs and reduce U5MR in HICs.

Keywords: Human resources for health; Maternal mortality; Under-five mortality; Infant mortality; Panel data analysis.

Ind-2767 Income-Related Inequalities in ACSC Hospitalizations in Canada: Results from 2005-2019 Surveys linked with Hospitalization and Tax Data

PRESENTER: **M. Karen Campbell**, Western University
AUTHORS: Sisira Sarma, Nazire Begen

Background: Hospitalization due to ambulatory care sensitive conditions (ACSCs) represents inadequate access to primary healthcare, since effective management of chronic conditions in primary care settings prevents such hospitalizations. The objective of this study is to investigate socioeconomic related inequalities in ACSC hospitalizations in Canada's healthcare system. Although income-based disparities in healthcare access are documented in the literature, the degree of inequality and specific factors contributing to inequalities in ACSC hospitalizations remain unclear. To address this, we quantified income-related inequality in ACSC hospitalizations and employed the recentered influence function (RIF) decomposition approach. **Methods:** This study uses data from the Canadian Community Health Surveys 2005-2019 linked with the hospital Discharge Abstract Database and the T1 Family File (tax file) from nine Canadian provinces. We quantified income-related inequality in ACSC hospitalization using the Erreyger's Concentration Index (ECI) and RIF–Ordinary Least Squares (RIF-OLS) estimator to examine ACSC hospitalizations by demographic and socioeconomic subgroups. We also used Blinder-Oaxaca-RIF (BO-RIF)-regression to decompose group-specific differences in ACSC hospitalizations by sex, income, rurality, and age group. **Results:** The ECI results revealed persistent disparities in ACSC hospitalization over the 14-year study period, with small variations over time. The estimated ECI values range from −0.004 to −0.006 ($p < 0.01$). Our results consistently show that lower-income groups experience higher ACSC hospitalizations. The stratified analysis revealed that disparities are more pronounced among women, older adults, rural residents, and low-income individuals. For example, in 2019, older adults (66-74) had a higher ECI for hospitalizations (−0.0095, $p < 0.1$) than younger adults (≤65) (−0.0035, $p < 0.01$). Individuals from low-income households had higher disparities in ACSC hospitalizations (ECI: 0.0072, $p < 0.05$) compared to non-low-income households (−0.0048, $p < 0.01$). The RIF-OLS decomposition analysis highlights several socioeconomic factors contributing to ACSC hospitalizations. For example, age, immigrant status, employment status, chronic conditions (≥2), lack of a primary care provider, and rurality are important factors. The BO-RIF-regression decomposition in 2019 for ECI between age groups (18-65 vs. 66-74) showed a significant difference of −0.0111 ($p < 0.01$), driven mainly by an explained effect of −0.0092 ($p<0.01$). For rural versus urban areas, the gap was 0.0055 ($p<0.05$), with an unexplained effect of 0.0057 ($p<0.05$). The most considerable disparity was observed between the low- and high-income groups, marked by a gap of −0.0206 ($p<0.01$), driven by both an explained effect of −0.0981 ($p<0.05$) and an unexplained effect of 0.0775 ($p<0.1$). **Conclusions:** Our results indicate persistent income-related inequalities in ACSC hospitalizations in Canada. The RIF analysis identifies the main contributors to such disparities, including age, immigrant status, employment status, chronic conditions, lack of having a family doctor, and rural residency. The BO-RIF-regression decomposition results show significant gaps across age, rural-urban, and income groups. To reduce ACSC hospitalizations, targeted policy measures should focus on improving access to primary healthcare services, especially at-risk populations such as immigrants, individuals with chronic conditions, low-income household members, and those living in rural areas.

Ind-2542 Setting up The Threshold of Mandatory Health Spending: Is It Still Relevant?

PRESENTER: **Retno Pujisubekti**
AUTHORS: Ery Setiawan, Iko Safika, Gregorius Dimas Herlambang, Izza Maulana Rizqi, Trihono Trihono, Arisna Widianingsih, Novira Hasya, Farhan Kurniawan

Background: One of Indonesia's recent transformative approaches in public health financing has granted district greater financial autonomy by eliminating the minimum 10% mandatory local government spending on health sector. Removing the threshold, however, has raised an ongoing debate over its effect on national and sub-national health program achievements and sustainability. Under decentralisation system, this approach may lead to higher variability in budget allocation and expenditures for health across over 500 districts. This also may influence the local government spending on health priority programs, such as addressing child malnutrition. To assess the effectiveness of using the minimum 10% threshold, this study aims to measure the effect of local government spending on improving health programs, specifically for child malnutrition.

Methods: Secondary data analysis from multiple sources was used to assess local government expenditures on child malnutrition status. First, the Indonesia National Health Survey 2021-2023 measured malnutrition status, including stunting, wasting, and underweight prevalence. Second, the Ministry of Finance panel data for 2019-2021 was used to measure total expenditure by the local government on health programs. A two-year time lag was applied between predictors and outcome variables. A panel fixed-effect linear regression was used to assess the effect of the share of health expenditure on each malnutrition status prevalence. Unit analysis consisted of the district level, with 1,527 balanced observations in total. The health expenditures were analysed in two approaches: 1) the binary variable (above versus below 10% threshold; and 2) the continuous variable (percentage of health spending per total expenditure). We also adjusted several variables of interest, including poverty rate, urban-rural composition, smoking prevalence, and the availability of health facilities.

Result: The district's average share of health spending was around 11% in 2019 and 2020 and slightly decreased to 9.1% in 2022, with a maximum share of 31% and a minimum lower than 1% across year. However, only 51% of districts in 2019 and 2020 and 38% of districts in 2021 met the mandatory 10% threshold. Multivariate analysis reveals that the districts that fulfil 10% health spending did not significantly influence the reduction of malnutrition status prevalence compared to those that did not meet the threshold. This implies no significant difference in child malnutrition progress between district that spent above or below 10% on health program. Using the continuous measurement, the share of health spending by 1% significantly decreases about 0.07% of wasting prevalence [95% CI: 0.003 – 0.14]. However, this was not significant with stunting and underweight prevalence. It is worth noting that smoking prevalence and urban rural classification were found to be significant factors influencing malnutrition prevalence.

Conclusion: Using a financing scheme to boost health outcomes may be ineffective if it solely relies on setting up the mandatory threshold. With decentralisation in place, evaluating district level budget allocation alongside the development of incentive and disincentive financing schemes is worth considering. The local government should also consider controlling the risk factors of malnutrition.

abs-os714 Assessing Immunization Coverage Survey Costs

PRESENTER: **Logan Brenzel**

AUTHOR: Helen Saxenian

Coverage surveys are an important tool to measure immunization coverage changes, especially as countries work to vaccinate previously unreached children. There is limited information in the public domain on the costs of carrying out different types of surveys in different contexts. This study begins to fill this gap in addressing several questions: 1) What is the average and range of costs of immunization coverage surveys, by type of survey, by method, location, and level of precision and representativeness? 2) What are the major cost drivers in different contexts and how might they be modified to improve efficiency? 3) Who have been the major funders of immunization coverage surveys and in which countries?

This study used a mixed-method approach of primary and secondary data collection and 45 stakeholder interviews. Coverage survey costs were collected and analyzed to generate benchmarks on the costs of surveys in different contexts, and to identify key cost drivers. A database of 59 surveys from 27 countries conducted between 2011 and 2023 was developed on survey characteristics, survey design, implementation, and detailed budget/cost information. Two-thirds of the surveys were from African countries. Thirty percent of the surveys used the WHO Cluster methodology; 20% were Multi-Indicator Cluster Surveys (MICS). 30% of surveys were powered to the district level. Data were analyzed using Excel and all costs were converted to US$2023.

The median total cost of the surveys in the sample was $250,000, ranging from $15,000 to $2.4m. The median cost/cluster was $1300, the cost/household was $90, and the cost per person surveyed was $109. The median cost per household was highest in for sample surveys in Latin America ($430), compared with surveys in the Eastern Mediterranean ($47). Surveys using the WHO cluster survey method have highest costs per cluster, while Lot Quality Sampling Assessment (LQAS) surveys have the lowest cost. Post campaign coverage surveys (PCCS) have relatively lower total costs but the highest cost/household among survey types. The major cost drivers of nearly all surveys were personnel, transportation, and field work costs. However, technical support, particularly international technical support costs can represent a large share of total costs (30% on average).

Coverage survey financing is sometimes highly fragmented. This can impact timeliness, cost, and quality of survey results. Improved coordination of financing is needed. Several budget inputs were thought to be under-budgeted in surveys, including time for data processing and dissemination, airtime for communication during field work, community engagement, and security for field work. Innovations are underway or on the horizon that could potentially reduce costs, including those related to data collection and analysis.

The results of this work will help to provide a reference point for review of budget elements and costs; improve communication between funders and implementers of surveys in negotiating budgets for surveys; and raise issues related to budgeting and financing of surveys that can improve the overall efficiency and quality of immunization coverage surveys.

Ind-2274 Current Overview of Cost Management Implementation in the Family Health Strategy (ESF) in Brazil

PRESENTER: **Andréia de Freitas**, Minist rio da Sa de do Brasil

AUTHORS: Everton Nunes da Silva, Maciene Mendes da Silva, Clementina Corah Lucas Prado

Introduction: The National Cost Management Program (PNGC), an initiative by the Brazilian federal government to promote a culture of cost management in the public health system, offers a costing methodology to address the specificities of various types of health establishments. In the case of the Family Health Strategy (ESF), which mobilizes multidisciplinary teams to provide healthcare that ranges from health promotion to rehabilitation, the PNGC has defined cost centers for each professional class, as well as the physical structure. Given its emphasis on prevention, the ESF plays a crucial role in containing and reducing costs in the healthcare system, making it essential to understand the current landscape of ESF adherence to the PNGC. Methods: Qualitative, descriptive, and documentary research on the cost calculation and management through the PNGC in basic units of the Family Health Strategy, based on access to documents developed by the Ministry of Health. Results: The ESF, which operates in Basic Health Units (UBS), promotes health with a focus on prevention, reducing the need for more complex and emergency medical services, thus contributing to a reduction in healthcare spending in the long term. Understanding how much these units cost and their output is fundamental for efficient service management. Within the scope of the PNGC, the costing methodology was adapted, based on absorption costing, to specifically address the ESF, and made available for municipal health secretariats that voluntarily chose to join the Program and use the SUS Cost Calculation and Management System (APURASUS). By October 2024, 17 municipal health secretariats and the Federal District had adhered to the PNGC, corresponding to 682 UBSs engaged in cost calculation and management, distributed across all regions of the country: 168 in the Midwest, 81 in the Northeast, 3 in the North, 288 in the Southeast, and 142 in the South. These units can calculate the total cost of the UBS; the cost of various cost centers (community health agent, nurse, family doctor, nursing technician per team, specialty outpatient clinics, vaccination room, oral health, etc.), making it possible to calculate the cost per health team; and the average cost of services provided. Conclusion: In the face of the growing challenges faced by the healthcare sector, especially in terms of managing limited resources and ensuring effective service delivery, cost management becomes crucial. The Ministry of Health's initiative to provide a tool that facilitates cost management in Family Health Teams, combined with the commitment of local managers to get involved, highlights a desire to implement more efficient administration and make more informed decisions.

Ind-1795 Application of Economic Criteria in Identifying and Prioritizing Emergency Preparedness and Response (EPR) Interventions in Africa

PRESENTER: **Dr Elias Asfaw Zegeye**

AUTHORS: Dr Joyce wamicwe, Justice Nonvignon, Dr Richmond Ensiwoyie, Dr Zana Somda, Brian Arwah, Osondu Ogbuoji, Dr Oyeldun Okunromade, Howard Nyika, Dr Kokou Nouwame Alinon, Carl Schutte, Dr Nicola Wiafe

Background The recent COVID-19 pandemic, the ongoing Mpox, Ebola and other epidemics in Africa have highlighted challenges that

countries on the continent face with optimal resource allocation, identifying and prioritizing interventions for effective emergency preparedness and response (EPR). To inform the development of a systematic and evidence-based process for priority setting and resource optimization, the five countries case studies conducted. **Method** We provide an overview of the approaches employed by African Union (AU) member states to identify and prioritize EPR interventions. The study is conducted through desk-based document review, key informant interviews with key stakeholders involved in EPR planning, and country visits in Uganda, Malawi, Nigeria, Burkina Faso and Morocco. **Result** The Five African Union Member states have used established tools such as Vulnerability Risk Assessment Mapping (VRAM) and WHO Strategic Tool for Assessing Risks (STAR) to prioritize pathogens of epidemic potential. They also adapt generic plans or plans from previous emergency responses to address new threats. Prioritisation of interventions is typically less structured. Decision makers consider factors such as health impact, socio-economic outcomes, ethical concerns, and equity when prioritising interventions. However, the consideration of these factors is not formalised and there is limited use of structured prioritisation processes which include consideration of economic criteria. Expert judgement and past experiences play a substantial role. Furthermore, review of data on the benefits and drawbacks of the different intervention options is not necessarily formalised, limiting decision makers' ability to assess the trade-offs of implementing one intervention option over another. The evidence co-production model used in the Nigeria COVID-19 response demonstrates how, even during the response phase, evidence can be generated to feed into decision-making. **Recommendation.** The assessment suggests that employing structured methods and processes for identifying and prioritizing interventions to implement in the context of EPR leads to more effective, fair, and equitable allocation of resources, resulting in improved health outcomes. Moreover, incorporating economic criteria approaches could encourage decision-makers to allocate more resources to EPR initiatives and enhance public trust in the decision process. Furthermore, incorporating economics criteria into these processes allows for optimization of limited resources

Ind-1961 Difference-in-Differences Analyses of Vaping and Smoking After E-Cigarette Flavor Bans: New Evidence from Canada

PRESENTER: **Shweta Mital**
AUTHOR: Hai Nguyen

Background: Flavors such as fruit, candy, and dessert ('youth-friendly' flavors) are common reasons for youths to start using e-cigarettes. Several jurisdictions in the US and Canada have banned these youth-friendly flavors in e-cigarettes to protect youths. However, these bans have been highly contentious. Recently, the Supreme Court of the United States was tasked with adjudicating whether the Food and Drug Administration's refusal to approve flavored e-cigarettes was unlawful. Similarly, three years since its first promise, nationwide bans on flavored e-cigarettes are currently on the table in Canada. Despite these ongoing debates, there is limited evidence on the effects of these bans. In particular, no study has examined the effects of the bans on use of flavored e-cigarettes. **Research Aims:** First, we study the effects of bans on use of youth-friendly flavors in e-cigarettes and overall e-cigarette use among both youth and adults. Next, we study possible substitution towards tobacco-flavored e-cigarettes and combustible cigarette use as a result of the bans. **Methods:** We use nationally representative, individual level survey data from all 10 Canadian provinces and difference-in-differences design to compare changes in outcomes in provinces that banned flavors in e-cigarettes with provinces that did not. Outcomes of interest include past 30-day use of youth-friendly flavored e-cigarettes, tobacco-flavored e-cigarettes, overall e-cigarettes and combustible cigarettes among youths and adults. **Results:** Among youths, the bans on flavored e-cigarettes were associated with 2.8 percentage points (p=0.02) reduction in past 30-day flavored e-cigarette use and 1.5 percentage points (p=0.04) reduction in overall e-cigarette use. We found no evidence of substitution towards tobacco flavored e-cigarettes or combustible cigarettes. There was also no effect of the bans on adults' use of flavored e-cigarettes or their overall use of e-cigarettes and combustible cigarettes. **Conclusions and Policy Implications**: Bans on flavored e-cigarettes are effective in reducing flavored e-cigarette use and overall cigarette use among youths. Furthermore, the null effects of the ban on combustible cigarette use alleviate concerns that the bans will promote combustible cigarette use among youths and adults.

1:30 PM –3:00 PM WEDNESDAY [Supply And Regulation Of Health Services And Products]

Bali International Convention Centre – Executive Room 2

Priority Setting, Quality of Care and Universal Coverage

MODERATOR: **Eduardo Gonzalez Pier**,

Ind-1867 Healthcare Workers' Preferences for Targeted Tuberculosis Interventions in Malawi: A Discrete Choice Experiment

PRESENTER: **Wala Kamchedzera**, Malawi Liverpool Wellcome Program
AUTHORS: Effita Fifi Masoamphambe, Wezi Msukwa-Panje, Patrick Msukwa, Augustine Choko, Rein Houben, Peter MacPherson, Nikita Arora

Background: Tuberculosis (TB) interventions that are not tailored to fit TB epidemics within settings are becoming less effective and efficient in eradicating the current TB disease burden. Interventions should be targeted to sub-populations that carry the highest TB burden as this is more cost-effective. In low-income countries like Malawi, limiting resource constraints makes decisions on resource allocation challenging. Choosing which population group to prioritise and how they should be targeted partly depends on practicability, and the health-system's capacity. Such dynamics are well understood by healthcare workers. This study aimed to measure healthcare workers' preferences for targeted TB case finding interventions in Malawi.

Methods: We designed and implemented a discrete choice experiment (DCE) to solicit healthcare workers' preferences for targeted TB case finding interventions. The DCE design was informed by literature and in-depth interviews. The study recruited 100 healthcare workers from one tertiary hospital and primary healthcare facilities across Blantyre, Malawi. Multinomial logit models were used to investigate preferences

for targeted TB interventions. We further estimated the marginal willingness to pay values for the different attribute levels.

Results: Overall, healthcare workers showed a preference for having any targeted TB case finding intervention over having no intervention at all (P<0.001). Healthcare workers were less likely to choose interventions that targeted at risk occupations (Odds Ratio [OR]: 0.79, 95% Confidence Interval [CI]: 0.64-0.97) and those that targeted males (OR: 0.54, 95% CI: 0.44-0.66) as compared to interventions that targeted geographical TB hotspots. They also preferred interventions that targeted all types of TB as compared to just targeting infectious TB (OR: 1.42, 95% CI: 1.19-1.69). They additionally showed a strong preference for interventions involving collaborating with community leaders as compared to no collaboration (0R: 1.54, 95% CI: 1.25-1.88). Healthcare workers also preferred interventions with non-financial (e.g: essential supplies, education and training) and financial benefits as opposed to none (P<0.001). Healthcare workers were indifferent to whether the intervention should focus on demand creation activities or TB diagnosis.

Conclusion: Our study provides insights on the value healthcare workers place on different characteristics of targeted TB interventions. The findings suggest that healthcare workers value targeted TB interventions and show strong preferences for those that target geographical hotspots whilst enabling collaboration with community leaders. However, these interventions need to be accompanied by incentives such as essential supplies for carrying out their work or financial staff benefits. Healthcare workers' preferences for interventions should be considered when designing new interventions. Understanding these preferences will ensure that interventions are context specific and are easily implemented by healthcare workers.

Ind-2422 Growth of Private Equity and Hospital Consolidation in Primary Care and Price Implications

PRESENTER: **Yashaswini Singh**
AUTHORS: Christopher Whaley, Nandita Radhakrishnan, Loren Adler

Research Objective: Consolidation of physician practices by hospitals and private equity (PE) firms has increased rapidly in the United States. This trend is of particular importance within primary care. Despite its significance, there is no systematic evidence on the emerging trends in ownership affiliation of primary care physicians (PCPs) and its association with prices paid for physician services. Using national data on insurer disclosed prices and PCP practice organization, this paper describes trends in hospital-affiliation and PE-affiliation in primary care and examines variation in negotiated prices paid by commercial insurers to hospital-affiliated, PE-affiliated, and independent PCPs.

Study Design: We used data from Pitchbook and IQVIA to examine hospital- and PE-affiliation of 198,097 PCPs. We linked PCPs and their affiliations to novel cross-sectional Transparency in Coverage (TiC) data. We analyzed 226.6 million negotiated prices for evaluation and management office visits (CPTs 99202-99205 and 99212-99215) across four national insurers (Aetna, BCBS, Cigna, United Healthcare). We used linear regressions to examine the association between hospital-affiliated, PE-affiliated, and independent PCPs and cross-sectional prices paid for physician services, with fixed effects for service, state, and insurers.

We examined the proportion of PCPs that are hospital-affiliated and PE-affiliated from 2009 to 2022. Using cross-sectional data from 2022, we also examined negotiated prices paid to physicians (physician professional fee) for office visits.

Principal Findings: PCPs affiliated with hospitals increased from 25.2% (28,216 of 111,793) in 2009 to 47.9% in 2022 (82,890 of 172,964). Over the same period, 1.5% (2,483 of 172,964) of PCPs became affiliated with PE firms. Relative to independent PCPs, negotiated prices for office visits are $18.28 or 11.5% higher for hospital-affiliated PCPs (CI: 6.5-16.80, $p < 0.01$) and $8.40 or 7.23% higher for PE-affiliated PCPs (CI: 1.13-10.24, $p < 0.01$).

Conclusion: The growing acquisitions of physician practices by hospitals and private equity firms is one of the most important recent trends in the organization of physician practices in the United States. As of 2022, nearly half of all primary care physicians are hospital-affiliated, while PE-affiliated PCPs are growing and concentrated in certain regional markets. Relative to PCPs in independent settings, hospital-affiliated PCPs and PE-affiliated PCPs have higher prices for the same services. Ownership and price transparency can uncover sources of price variation that will be important for policymakers to monitor. 2

Ind-2210 Testing the Norms Hypothesis Within-Physician Differences in Care by Insurance Type in U.S. Medicare

PRESENTER: **Eran Politzer**, Harvard University
AUTHORS: John Z. Ayanian, Bruce Landon, Vilsa E. Curto, Jeffrey Souza, Timothy S. Anderson
Background The "norms hypothesis" posits that physicians do not customize treatment decisions based on a patient's specific insurance reimbursement arrangements but instead adopt a relatively uniform treatment style that best conforms to the average or modal insurance coverage and reimbursement mechanisms across their patient population or within their geographic area. This study investigates the norms hypothesis in the context of the U.S. Medicare program by examining differences in care patterns for similar patients being cared for by the same primary care physician but enrolled in traditional Medicare (TM) or private Medicare Advantage (MA) plans. **Methods** Based on the universe of 2021 TM claims and MA encounter data, we identified primary care physicians (PCPs) who treated at least 25 patients from each program. We compared the annual utilization of services by similar MA and TM patients under each PCP using multivariable linear regressions, controlling for PCP fixed effects, patient demographic characteristics, and 30 chronic conditions identified using the Chronic Conditions Warehouse algorithms. Services analyzed include those largely at PCP discretion (e.g., number of PCP visits) and those likely requiring MA plan authorization. To address potential differences in MA coding practices, we excluded chronic conditions coded in chart reviews, and examined the sensitivity of the results to estimating a model that does not control for chronic conditions. **Results** We analyzed 80,093 PCPs, who each treated an average of 125.2 (SD: 108.8) MA patients and 175.9 (SD:136.7) TM patients. We found across the board lower utilization for PCPs' MA patients, compared to their similar TM patients. MA patients had 7% fewer annual PCP visits and 17% lower drug utilization. For services likely requiring prior authorization, MA patients had 25% lower utilization of radiology services, like CT scans and

MRIs and 42% lower utilization of musculoskeletal services, such as knee replacements. When controlling only for patients' demographic characteristics, within-PCP differences were smaller but utilization remained significantly lower for MA patients. **Conclusions** Our findings reveal substantial utilization differences between similar MA and TM patients under the care of the same PCP, with consistently lower service use among MA patients. The observed gaps, even for services typically under PCP discretion, challenge the norms hypothesis, and suggest possible differential treatment based on insurance type. These within-PCP gaps may contribute to the observed lower utilization of services in MA compared to TM. However, larger within-PCP utilization gaps in services that likely require prior authorization imply that MA care management tools play a significant role. Additionally, residual unmeasured selection effects may contribute to our estimated differences, for example, if MA enrollees are, in general, less prone to seek care.

Ind-2064 Rationing By Race

PRESENTER: **Manasvini Singh**
AUTHOR: Atheendar Venkataramani

Background

Decision-makers often allocate scarce resources using some mechanism based on social values (such as demonstrated need, lottery systems, wait lists etc). However, increasing scarcity can drive them to rely on implicit or explicit biases or heuristics when allocating resources. For instance, laboratory studies suggest that markers of group identity, such as race, unduly influence rationing decisions under scarcity. Thus, in this study, we provide causal evidence that resource scarcity exacerbates race-based disparities in healthcare, adversely impacting Black patients. This work bridges a critical gap in understanding how scarcity interacts with discrimination in real-world, high-stakes contexts.

Research Question

How does resource scarcity affect resource allocation – and ultimately outcomes -- for Black vs. White patients in hospital settings?

Methods

We analyze electronic health record data from 107,000 patient admissions from 2015–2018 across two hospitals in a large urban academic system in the southeastern United States. Informed by a conceptual framework linking resource scarcity to cognitive and systemic biases in the medical setting, we leverage plausibly exogenous variation in hourly hospital capacity strain as our measure of resource scarcity and examine how it affects rationing of hospital resources -- specifically beds and provider effort -- and mortality outcomes for Black vs. White patients. Machine learning and text analysis methods are applied to unstructured data from patient records to infer provider effort.

Results

We first show that in-hospital mortality rates rise disproportionately for Black patients as capacity strain increases. At the highest decile of strain, mortality increases approximately 15-17% more for Black patients than for White patients. As mechanisms, we show that discriminatory rationing of hospital beds can explain this widening disparity in mortality: Black patients experience larger increases in wait times for inpatient beds than White patients under strain. Notably, at all levels of strain, sick Black patients wait longer for beds than healthy White patients. In a more suggestive set of analyses, we show that Black patients receive less detailed and lower-quality clinical documentation than White patients, a disparity that widens under high strain. Reduced effort in record-keeping correlates with poorer care quality and worse health outcomes for Black patients.

Conclusion

This study uncovers a critical link between resource scarcity and discrimination, demonstrating how capacity strain exacerbates racial disparities in healthcare access and outcomes. These findings emphasize the importance of loosening resource constraints as a way to mitigate bias and promote equitable healthcare delivery. For instance, policies aimed at increasing hospital capacity or optimizing resource allocation could reduce discriminatory practices, even without explicitly targeting bias. This work has broader implications for understanding how scarcity shapes social inequities in other domains.

Ind-710 The Rise and Fall of Priority Setting in Mexico: Lessons from a Health Systems Perspective

PRESENTER: **Eduardo Gonzalez Pier**
AUTHORS: Mariana Barraza Llorens, Jaime Sepulveda Amor

Background: In 2004, Mexico launched Seguro Popular (SP), a significant policy intervention aimed at achieving universal health coverage (UHC) for the uninsured population through two targeted Health Benefits Packages (HBPs). SP employed an explicit priority-setting approach to optimize resource allocation, expanding access to essential services and high-cost interventions while attempting to mitigate catastrophic health expenditures. By 2020, SP had enrolled about half of the population (52 million individuals) and integrated 294 prioritized essential services and 66 high-cost interventions into its coverage portfolio. However, in 2020, SP was repealed, largely due to political and operational challenges, raising critical questions about the sustainability of priority-setting frameworks in health reform. This study (publication forthcoming) investigates SP's approach to priority setting, its impact on healthcare access, financial protection, and equity, and explores systemic factors that influence policy sustainability for priority setting.

Research Aim: This research aims to critically assess and proactively inform sustainable priority-setting practices in health policy.

Methods: The study utilizes a mixed-methods approach combining qualitative policy analysis with quantitative impact evaluation. Policy analysis was conducted on SP's HBP design and implementation strategies, examining policy documents, budgetary allocations, and regulatory

frameworks from 2004 to 2020. The quantitative analysis involved secondary data from national health accounts and household surveys in assessing SP's impact on key indicators: population coverage, the incidence of catastrophic health expenditures, and regional disparities in access. Analytic techniques included trend analysis and stratified comparisons across socioeconomic groups.

Key Results: Seguro Popular achieved substantial increases in healthcare access for uninsured populations and reductions in catastrophic health expenditures, demonstrating the potential of HBP to improve financial risk protection in a middle-income country context. However, persistent operational challenges undermined the program's political support, including constrained fiscal space, inter-regional inequities in service provision, and insufficient integration with the broader health system. Political vulnerabilities, such as unmet service quality expectations, reliance on discretionary budget allocations and shifts in policy priorities, ultimately contributed to SP's repeal, exposing the fragility of priority-setting reforms lacking institutional safeguards.

Conclusions and Implications: This study illustrates the critical role of explicit priority setting in advancing UHC but highlights the necessity of embedding these mechanisms within a resilient, depoliticized institutional framework. Sustainable health reforms must integrate adaptable funding strategies for middle-income countries, secure cross-party political support, and reinforce transparency in HBP development and resource distribution. Mexico's experience with SP provides valuable insights into designing politically robust, equity-focused, priority-setting processes to achieve and sustain UHC in dynamic policy environments.

Ind-1296 Setting Healthcare Priorities at the District Level in Malawi: A Qualitative Evaluation of Resource Allocation Processes.

PRESENTER: **Monica Patricia Malata**
AUTHORS: Fiammetta Bozzani, Jobiba Chinkhumba, Charlotte Ward, Wanangwa Chimwaza, Alinane Linda Nyondo-Mipando, Victor Mwapasa, Timothy Powell-Jackson, Catherine Goodman

Background

Priority setting and resource allocation (PSRA) processes are essential for optimising health system performance. These processes are especially critical in low- and middle-income countries (LMICs) like Malawi, where resources are severely constrained. With only 9% of government expenditure allocated to health and per capita health spending at $40—both below international benchmarks—Malawi, like many low resource settings, faces severe gaps between health needs and available resources, making effective resource allocation critical.

Resource allocation occurs at multiple levels, but in LMICs, sub-national processes have gained prominence due to decentralised health systems. There are several goals for resource allocation, such that processes might aim to efficiently, equitably, democratically, or justly distribute resources. Thus, evaluating priority setting processes from a multidimensional framework, encompassing both procedural and consequential aspects of priority setting processes, is critical.

Aim

To evaluate district level healthcare priority setting processes in Malawi.

Methods

We used a qualitative case study approach. Our study used the Priority Setting Evaluation Framework that assessed resource allocation using both consequential conditions (efficiency, equity, stakeholder satisfaction, stakeholder understanding, reallocation of resources, and implementation of decisions) and procedural conditions (stakeholder engagement, empowerment, transparency, use of evidence, community values, and mechanisms to reinforce decisions). Data were collected from February to May 2024 in two districts. Semi-structured interviews were conducted with 25 purposively selected health managers, service providers, and community stakeholders. We also observed district healthcare implementation planning meetings, to triangulate with interview data. All interviews were audio-recorded and transcribed. We used framework method for analysis, coding data using NVIVO 21 software.

Results

Districts made resource allocation decisions in the context of a highly constrained decision space. In terms of the consequentialist conditions, consideration of efficiency in decision-making was limited to the consideration of activity costs. Neither district considered equity in their decision making. In both districts, funding allocations remained relatively unchanged, as participants reported recycling of annual plans. Turning to the proceduralist conditions, district stakeholders drew on local epidemiological data to formulate plans, although the final decisions were not based on these data. In district 1, frontline workers had a better understanding of the planning processes, but in both districts, frontline workers and middle managers reported low satisfaction with the process. Regarding procedural fairness, health managers made decisions, with frontline workers only engaged in district 1, while community members were excluded in both districts. Development partners were reported to select their areas of focus without consideration of district priorities. The final decisions were not shared with frontline workers or middle managers. Overall, there were no mechanisms to ensure timely and standardised processes were followed.

Conclusion

The priority setting and resource allocation processes at the district level lacked stakeholder engagement, transparency, and adaptability. The limited decision-making space, exclusion of community voices, untimely planning, and poor communication with frontline workers and middle managers highlight systemic weaknesses that undermine the entire process. Districts need greater autonomy, standardised processes, and mechanisms that ensure transparency, equity, and stakeholder involvement in decision-making to improve their priority setting and resource allocation processes.

Ind-2606 Impact of the Family Doctor System on Healthcare Utilization and Medical Costs of Diabetics: Multistage Difference-in-Difference Analysis

PRESENTER: **Luying Zhang**
AUTHORS: Wen Chen, Xinyi Liu

Background: This study assessed the effectiveness of family doctor system in China on diabetics' healthcare services utilization and medical costs.

Methods: We conducted this study in an eastern Chinese city, an early adopter of the family doctor system in 2015. Our cohort included all diabetes patients registered in the city's official health management information system. Utilizing patient IDs, we merged individual-level data from the medical insurance claim database, encompassing demographic characteristics, healthcare utilization, and expenditures from 2014 to 2019. Given the phased implementation of the family doctor system, with annual enrollment of diabetics into the system, we applied a multi-stage difference-in-difference analysis to evaluate the program's impact over its various stages of deployment.

Findings: Our study included 62,365 diabetes patients (mean age 64.83 years; 43.71% male, 56.29% female). New registrants in the first stage experienced a 0.971 increase in annual outpatient visits and a 14.7% rise in outpatient expenses, notably with a 2.126 increase in community health center (CHC) visits and a 26.6% surge in CHC outpatient costs, while their visit frequency and cost of secondary/tertiary hospital and pharmacy significantly declined. Second-stage renewals exhibited no differences in annual visits but had a 1.949 reduction in pharmacy visits and a 144.0% decrease in pharmacy costs. Those newly registering in the second stage had a 2.545 increase in outpatient visits and a 28.0% rise in outpatient expenses, mainly from CHCs. Throughout, there was no significant change in the total medical expenses of diabetic patients, but their out-of-pocket expenses significantly decreased ($P<0.05$).

Interpretation: The family doctors, act as a soft gatekeeper in the healthcare system, successfully enhancing primary care utilization among diabetic patients while controlling patients' out-of-pocket expenses. This highlights the system's potential in enhancing chronic disease management, offering valuable insights for policymakers aiming to improve healthcare delivery and financial protection in similar contexts.

Ind-712 Somatic Comorbidities and Medical Expenses Among Patients with Severe Mental Disorders: Evidence From Community-Based Data in Beijing

PRESENTER: **Junli Zhu**

Background: Patients with severe mental disorders (SMD) often experience impaired social adaptability due to severe symptoms, placing them at a heightened risk of poverty. Although the government has implemented various policies to subsidize the mental health economic burden for this group, their high prevalence of somatic diseases continues to entrench many in poverty. Existing studies often rely on simple comorbidity counts or binary methods, which may overlook the varying impact of different disease types on healthcare expenses. Therefore, this study aims to assess the comorbidity status of patients with SMD by analyzing medical data from communities in Beijing and to explore the impact of various somatic comorbidity types on healthcare expenditures for SMD patients. **Method:** Data in this study include basic demographic characteristics and medical records of patients, covering healthcare utilization and expenses. Demographic information was collected through follow-up assessments and surveys conducted by community psychiatrists, while healthcare utilization and expense data were sourced from patients' medical records from 2019. The sample was obtained through stratified cluster sampling based on Beijing's administrative districts, yielding a final sample of 4,940 patients. Somatic diseases were classified according to ICD-11, and comorbidity counts were calculated. Chi-square, Z-tests, and the Kruskal-Wallis H test were used for group comparisons in the statistical analysis. A censored least absolute deviation (CLAD) model was applied to analyze factors influencing healthcare expenses, sequentially building three sequential models to examine the effects of various factors on total medical expenses. **Results:** The average total healthcare expenditure per patient was 16,456 RMB, with approximately 10,293 RMB attributed to mental disorders (63%) and 6,162 RMB to somatic conditions (37%). Significant differences in expense distribution were found between comorbid and non-comorbid groups across various disease categories. In terms of comorbidities, only 39.41% of patients had no somatic comorbidity. The most common comorbidities were circulatory diseases (36.6%), respiratory diseases (32.3%), digestive diseases (30.6%), and endocrine, nutritional, and metabolic diseases (29.8%). The regression analysis showed a significant positive correlation between the number of comorbidities and healthcare expenses ($p<0.001$). Comorbidities in ICD-11 chapters 2, 5, 7, 8, 9, 11, 13, 15, and 16 significantly influenced the expenses model ($p<0.05$). **Conclusions:** This study found that comorbidities are widespread in patients with SMD, and most of them lead to a significant increase in patients' medical expenses. Therefore, the treatment for SMD patients should address the prevention, management, and treatment of their somatic comorbidities to reduce the incidence and progression of these somatic comorbidities and, thereby alleviating the healthcare expenses burden on these patients. **Keywords:** Health Service Research; Community Mental Health; Psychotropic Drugs; Psychiatric Services; Expense Analysis

Ind-2832 Actuarial Challenges and Financial Sustainability of Indonesia's National Health Insurance (JKN): A Decade of Insights (2014-2024)

PRESENTER: **Fera Rusanti**
AUTHORS: Mr. Mahlil Ruby, Mr. Benjamin Saut Parulian Simanjuntak, Mr. M. Mizmara Alan Falihin

The premium setting for the National Health Insurance (JKN) program from 2014 to 2024 has shown a misalignment with actuarial practice standards, significantly impacting the program's sustainability. This study aims to examine the effects of non-actuarial-based premium policies on financial stability, the balance between revenue and benefit expenditures, and the sustainability of the Social Security Fund (DJS). Based on an analysis of premium trends, claim ratios, and related policies, it was found that the misalignment was caused by socio-political pressures, limited actuarial data, and government priorities in maintaining premium affordability. Since its inception in 2014, the Cost Per Member Per Month (CPMPM) has consistently exceeded the Premium Per Member Per Month (PPMPM) by 17-40%. Phenomena such as the golden cross

in 2019 and the death cross in 2023 illustrate the dynamics of financial imbalance within the program. To project medium-term financial conditions, actuarial risk analysis indicates that the growth rate of CPMPM will continue to outpace that of PPMPM. An actuarial loss ratio reaching 115% in 2024, with projections exceeding 150% by 2028, underscores the critical urgency of strengthening premium-setting policies to ensure financial stability and sustainability. This study recommends the consistent application of actuarial approaches in premium determination, risk-based adjustments, and enhanced cost control as solutions to ensure program sustainability. The findings of this study are expected to provide strategic input for the government in sustainably managing JKN. Keywords: JKN, premium determination, actuarial analysis, financial imbalance, loss ratio, program sustainability

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1:30 PM –3:00 PM WEDNESDAY [Health Beyond The Health System]

Bali International Convention Centre – Nusantara 1

Substance Use and Addiction

MODERATOR: **Adam Akmal Dzulkipli**,

Ind-99 Rural-Urban Migration and Substance use: A Temporal Causal Analysis Using Staggered Difference-in-Difference Regression

PRESENTER: **Adeola Oyenubi**, University of the Witwatersrand
AUTHOR: Umakrishnan Kollamparambil

Background and Contribution: While various risky behaviour outcomes of rural-urban migration have been explored in empirical literature, the relationship between substance use and migration has been largely studied in literature using cross-section data making it difficult to establish the causal effect of migration on substance use behaviour. Aside from exploring the causal effect of migration on the level of substance use using longitudinal data, this study is the first to examine the effect of migration on initiation of substance use and present post-migration temporal dynamics of substance use. **Research questions:** i) How does rural-urban migration impact substance use? ii) Does rural-urban migration influence the likelihood of initiating substance use? iii) Is there heterogeneity in the causal effect of migration on substance use across sex and age groups? **Data and Methods:** This study used five waves of a nationally representative longitudinal data over the period 2008-2017 to explore the causal effects of migration on substance use in the South African context. The outcome variable of substance use is constructed from three smoking and alcohol consumption behaviour variables using factor analysis. To explore heterogeneity in effect by demographic factors, the analysis is disaggregated by gender and age. The study is one of the first to use the heterogeneous robust difference-in-difference estimator introduced by de Chaisemartin and d'Haultfoeuille (2024) which allows for staggered treatment methodology to not only study the causal effect but also explore post-treatment temporal dynamics. **Results:** The analysis found that migration leads to increased substance use among men, but not among women. Moreover, this rise in substance use among men is not limited to the immediate post-migration period but persists in the medium term in subsequent years. The analysis also shows that the effect is stronger for individuals who are below the age of 35 when they migrated. Further, restricting the analysis to the population of those who report no substance use before migration, the study found that migration increased the likelihood of initiation for men, women and younger migrants significantly. The findings from the study remained consistent across various robustness checks including the use of equally weighted index, robustness to the assumption about initial condition and alternative estimation method. **Conclusion**: The gender differences found in increased substance use following migration can be explained by the variation in coping mechanisms typically adopted by men and women, whereby migrant men, more than women, are likely to externalize stress through behaviours such as substance abuse. The finding on initiation is important, particularly for women and young people. Given the serious individual and societal consequences of substance abuse, this study highlights the urgent need for preventative measures targeting new migrants, focussing especially on male and young migrants in urban centres. Additionally, the study findings suggest that interventions for addiction management should be made available to migrants who have settled in urban areas, helping to mitigate the long-term negative effects of migration on substance abuse.

Ind-1507 The Impact of Opioid Dependence Treatment on Employment, Government Service use, and Opioid-related Healthcare: Evidence From Physician Exits

PRESENTER: **Francis Graham**
AUTHORS: Dennis Petrie, Suzanne Nielsen, Sonja De New

Opioid dependence treatment the most effective treatment for managing opioid use disorder, yet little is known about the consequences of treatment disruption. Using Australian pharmaceutical claims linked to health, tax, and service records, we examine ODT patient outcomes following prescriber exit. Patients whose prescriber exits experience a 10 percentage point drop in retention 6 months after exit. They also experience shifts in healthcare use, including fragmented chronic disease management. Labour market outcomes remain stable, but decreased government service use raises concerns about increased economic insecurity. Our findings highlight the broader consequences of treatment disruption for patient well-being.

Ind-2011 Smoking Like a Hero? Media Regulation and Adolescents Smoking Behaviour in Mainland China

PRESENTER: **Liyuan Sun**

Background: Viewing movies or TV figures smoke particularly promotes adolescents' smoking initiation as they are prone to mimicking as reference points. When smoking is portrayed as normative, the role model effect of movie or TV characters might lead teenagers to overestimate smoking prevalence and hence smoke. Since no rating system for media content and the national minimum smoking or alcohol use age is not enforced in mainland China, the National Radio and Television Administration (NRTA) announced and implemented a first-ever

media regulation to restrict smoking scenes in movies and TV series in early 2011. This is to keep people, particularly adolescents, away from smoking content and tobacco. However, it is concerning that adolescent smoking prevalence still increases.

Objectives: We aim to answer whether the media regulation on smoking content on movies and TV influences adolescents' (i.e., age 10-19) smoking behaviour in mainland China and offer policy implications.

Methods: Based on wave 2015 of the China Health and Nutrition Survey (CHNS), this paper draws upon quasi-experimental evidence from the regulations on reducing smoking content in movies and TV series. We explore the probability of smoking and daily cigarette consumption of people from different birth cohorts using a unique cohort difference-in-differences (DiD) strategy. We treat respondents who were adolescents in the pre-policy period and watched media content as the treatment group. Respondents who were young adults (i.e., aged 20-24) before the policy or did not access media content serve as the control group. We plot the event study graph to show the effect on each birth cohort with socio-demographic controls and fixed effects. We also explore the heterogeneity between several key characteristics.

Results: Having satisfied the parallel trend assumption, the regulation of media smoking content reduces adolescents' probability of smoking by 23.5% and daily cigarette consumption by 0.52 standard deviations relative to young adult cohorts, but the effects fade when they become adults. Effects are mainly contributed by males, rural residents and provinces that haven't implemented indoor public space smoking bans. results are solid over the robustness check.

Discussions: the media regulation has achieved its aim of curbing adolescents' smoking behaviour. It is not surprising that it is mainly contributed by male adolescents since over 90% of the smoking population is male. Other countries with similar environments to China can learn from this policy, while policymakers should think of how to maintain the effect when adolescent becomes adult. Further studies can work on the mechanisms and explore other drivers of the increasing adolescent smoking prevalence.

Ind-2835 Perception of the Relative Harm of Electronic Cigarettes Compared to Combustible Cigarettes and its Correlates: Empirical Evidence from Indonesia

PRESENTER: **Puguh Prasetyoputra**
AUTHORS: Lazuradi Imran, Harris Siagian, Agus Syarip Hidayat, Alan Farandy, Felix Wisnu Handoyo
Abstract Title: Perception of the Relative Harm of Electronic Cigarettes Compared to Combustible Cigarettes and its Correlates: Empirical Evidence from Indonesia Electronic cigarettes (e-cigarettes) have gained significant popularity in recent years as alternatives to traditional combustible cigarettes (c-cigarettes). In Indonesia, the prevalence of e-cigarette use has increased tenfold, from 0.3% in 2011 to 3.0% in 2021, equivalent to 6.2 million adults. This rapid growth has sparked debate regarding the relative harm of e-cigarettes compared to combustible cigarettes. While some studies have suggested that e-cigarettes are less harmful, others have argued that they may be equally detrimental to health. Conflicting evidence has led to uncertainty among consumers and policymakers regarding the potential risks and benefits of using e-cigarettes.

Despite the growing body of research on e-cigarettes, there is limited evidence on how individuals perceive the relative harm of e-cigarettes compared to combustible cigarettes, particularly in low- and middle-income countries, such as Indonesia. Understanding these perceptions is crucial as they can significantly influence smoking behaviours and public health outcomes.

This study aimed to address this research gap by examining the perceived relative harm of e-cigarettes compared to c-cigarettes among Indonesian smokers. Additionally, we investigated the smoking-related, demographic, socioeconomic, and spatial correlates of these perceptions to provide a comprehensive understanding of the factors that influence harm perception.

We analysed data from a Discrete Choice Experiment (DCE) survey conducted in 2024. The survey included 627 Indonesian smokers aged 18 years and above. We fitted logit regression models to the data and used the average marginal effect (AME) as a measure of association. The results suggest that most respondents (41.57%) perceived e-cigarettes as equally harmful as cigarettes, 37.54% perceived e-cigarettes as more harmful, and only one in five (20.89%) perceived e-cigarettes as less harmful than c-cigarettes. Smokers who frequently use e-cigarettes, have no flavor preference, married or living together, and more educated were less likely to perceive e-cigarettes as equally or more harmful than combustible cigarettes. However, having children increases the probability of perceiving e-cigarettes as equally or more harmful.

These findings could inform regulatory decisions regarding e-cigarettes in Indonesia, potentially influencing policies on product labeling, marketing restrictions, and public health campaigns. However, it is crucial to balance accurate risk communication with measures to prevent youth initiation and non-smoker uptake of e-cigarettes. Future research should focus on the long-term health effects of e-cigarette use and the impact of different policy approaches on smoking behaviors and public health outcomes in Indonesia.

Ind-787 Using Machine Learning to Predict the Health Outcomes and Costs of Legalising Domestic Sale of Vaporised Nicotine Products

PRESENTER: **Jun Kiat Ng**, Australian National University

Background

There is increasing interest in advancing New Zealand's efforts to achieve its smoke-free goal. Traditionally, the impact of tobacco interventions on Quality Adjusted Life Years (QALYs) and associated Health System Costs (HSCs) is modelled using two approaches: (1) the Smoking and Vaping Life Table Model and (2) the Proportional Multistate Life Table Model. These models provide a structured framework to assess the potential health and economic outcomes of interventions in line with New Zealand's public health goals. Tobacco interventions that have been explored include: (1) Tobacco Tax Increase, (2) Tobacco Free Generation, (3) Outlet Reduction, (4) Sinking Lid, (5) Combination of multiple

interventions, amongst others.

Motivation

Studying the effects of legalising vape is compelling. On the one hand, it serves as a potential cessation tool for smokers. On the other hand, it could be an entry point for other smokers to eventually pick up smoking. A primary motivation for this research is to assess the impact of legalising vaping on these public health outcomes.

Research Aim

This research aims to leverage the findings of previous research papers to build a Machine Learning model that predicts the effects of legalising domestic sale of vaporised nicotine products, or vape for short, on (1) Quality Adjusted Life Years (QALYs), (2) Health System Costs, and (3) Māori/non-Māori health inequities.

Methods

To do this, we leveraged data from the Burden of Disease, Epidemiology, Equity and Cost-Effectiveness (BODE3) Health Intervention League Table, which compiles findings from multiple research studies modelling QALYs and HSCs. Prior to its integration into the machine learning models, each intervention is parameterised according to five key features: (1) Percentage of Tax Increase, (2) Percentage of Outlet Reduction, (3) Percentage Drop in Smoking Prevalence, (4) Percentage Decrease in Tobacco Supply, and (5) Percentage Decrease in Smoking Uptake. These parameters are intended to capture the essential characteristics of each intervention, providing a structured input for model training. The machine learning algorithms employed in this study include Random Forest and Extreme Gradient Boosting (XGBoost), alongside methodological techniques such as upsampling and cross-validation.

Preliminary Results

We have successfully trained machine learning models using data from previous studies to predict QALYs and HSCs. Moreover, we evaluated various algorithms and hyperparameter configurations to develop an optimal predictive model. Once refined, this model will be used to estimate the potential effects of legalising vape on these public health outcomes, including QALYs and HSCs. In addition, this study has enhanced input data extracted from the literature, which are often incomplete and disaggregated by only a subset of demographic groups, such as age, gender, and ethnicity, rather than comprehensively across all relevant categories.

Conclusions and Policy Implications

This study estimates health and cost outcomes of tobacco interventions with greater granularity, including distinctions by age, gender, and ethnicity. Given the novelty of this approach within the field, this study provides a methodological framework for future applications of machine learning for the prediction of critical public health outcomes to guide policies.

1:30 PM –3:00 PM WEDNESDAY [Economic Evaluation Of Health And Related Care Interventions]

Bali International Convention Centre – Lotus

Economic Evaluations of Maternal and Child Health

MODERATOR: **Lungiswa Nkonki**,

Ind-432 Estimating Cost of School-Aged Population Screening in Integrated Primary Health Care for Non-Communicable Diseases in Indonesia

PRESENTER: **Gregorius Dimas Herlambang**
AUTHORS: Trihono Trihono, Ery Setiawan, Retno Pujisubekti, Anooj Pattnaik

Background: Indonesia's Ministry of Health (MoH) has introduced Integrated Primary Healthcare (ILP), transitioning from a program-based approach to a life cycle strategy in primary health care. As part of this shift, school-aged children (6–18 years old) are more comprehensive for non-communicable disease (NCD) screening. The screenings including anthropometry, vision and hearing, mental and dental health, and detection of anemia and diabetes. However, the current National President Quick Win Program named Free Health Screening (FHS) initiative under ILP does not include detailed cost assumptions and does not fully account for children in non-formal and out-of-school settings. This study estimates the cost and five-year budget implications of implementing nationwide school-based NCD screening to inform planning and support more effective resource alignment.

Methods: We used a provider perspective to estimate the cost per child screened, based on unit costs from the Ministry of Health's electronic procurement catalogue (e-catalogue) for consumables, medical devices, and human resources. Two screening packages were defined in accordance with ILP guidelines: a Basic Package consisting of anthropometry, vision and hearing, mental health, and dental/oral checks; and a Moderate Package that adds hemoglobin and blood sugar tests for anemia and diabetes detection. Population projections were developed using school participation rates from the National Socioeconomic Survey (SUSENAS) for 2012–2023 and Ministry of Education enrollment data from 2019–2023. Forecasts of school-aged population (2025–2029) included children in formal, non-formal, and out-of-school categories, using Auto-Regressive Integrated Moving Average (ARIMA) and linear regression models. Five-year budget projections assumed full annual coverage and 5% inflation.

Results: By 2025, the eligible school-aged population is projected to be 53.1 million children, 48.4 million in formal and non-formal education and 4.7 million out-of-school. Unit cost estimates are IDR 33,091 (USD 2.00) for the Basic Package and IDR 58,054 (USD 3.58) for the Moderate Package. This translates into an annual budget requirement of IDR 1.75 trillion (USD 107.9 million) for the Basic Package and IDR 3.08 trillion (USD 189.8 million) for the Moderate Package. Over five years, the projected cumulative budget is IDR 8.78 trillion (USD 541.9 million) for Basic and IDR 15.47 trillion (USD 954.4 million) for Moderate. Meanwhile, the current FHS budget allocates around USD 1.47 per child and mainly targets children in formal schools, leaving 28.4 million children outside the service scope and creating an estimated annual funding shortfall of USD 72.3 million. In addition, no secured five-year financing plan currently exists for this expanded service.

Conclusion: The findings highlight the need for more realistic and inclusive budget planning to support the expansion of school-based NCD screening under ILP. The Basic Package may offer a financially manageable starting point for broader implementation, while the Moderate Package could be considered where additional diagnostic benefits justify the higher cost. As a way forward, the Ministry of Health may consider updating unit cost assumptions and expanding the defined target population to include children in non-formal and out-of-school settings. To ensure sustainability, this effort would benefit from phased budgeting integrated into medium-term expenditure frameworks, along with stronger collaboration between the Ministry of Health, Ministry of Finance, and Ministry of Education to align financing, coverage data, and service delivery plans. This study offers a technical reference for anticipating fiscal requirements and planning toward more equitable screening coverage nationwide.

Ind-1395 Understanding the Potential Value of Adolescent Sexual and Reproductive Health Education in South Africa: A Cost Consequence Analysis

PRESENTER: **Funeka Bango**, University of Cape Town
AUTHORS: Sue Cleary, Linda-Gail Bekker

Background: Promoting the sexual and reproductive health (SRH) of adolescent girls remains central to enabling their health, education, and economic prospects. As endorsed by the United Nations agencies, school-based comprehensive SRH education (CSE) is a priority in many low and middle-income countries (LMICs), which are disproportionately affected by poor adolescent SRH outcomes. This is the case for South Africa, which faces an ongoing need for effective CSE programmes. While CSE is associated with improved sexual knowledge, attitudes and behaviours, implementing these interventions in most LMICs is inconsistent due to complex contextual factors. Consequently, the economic aspects of these interventions are underexplored, and little is known about their economic value. The objectives of this study were to estimate the costs and consequences of a within-trial afterschool CSE intervention targeted at adolescent girls in South Africa. While implementing the intervention faced significant challenges, resulting in failure of the trial to show impact on primary biological outcomes, rich variety of data were collected. This was critical for understanding the cost burden of poor SRH outcomes in a vulnerable population and exploring the economic aspects of CSE.

Methods: We conducted a within-trial cost analysis and a modelled cost-consequence analysis from a societal perspective, including a multisectoral provider (healthcare and education) and learner perspectives, using a Markov modelling approach. Our time horizon was the period of high school (5 years). The model was calibrated using trial and country-level data. The scope of costs included any changes in direct provider and learner costs. Provider costs included intervention costs and those associated SRH services. Learner costs were limited to the transport costs associated with accessing the intervention. Modelled intermediate outcomes included % pregnant, % giving birth and % time spent in school, and final outcomes included life years and quality-adjusted life years (QALYs). We conducted multiple one-way sensitivity analyses and scenario analyses to explore drivers of impact and potential value for money.

Results: Girls enrolled in the trial had a high need for SRH services. In our base case analysis, 24.3% were positive for sexually transmitted infections, 20.9% were using contraceptives, and 22.9% were modelled to fall pregnant over the course of high school. The estimated undiscounted healthcare provider cost per learner was $289.66, with contraceptives and obstetric services accounting for 48% and 47% respectively. The CSE intervention added $134.70 to the costs, and learner costs were estimated at $22.71. The total societal costs were $447.07, while the life years and QALYs were estimated at 4.9 and 4.4, respectively. Scenario analysis demonstrated key shifts in costs resulting from implementing an effective CSE intervention, specifically for the healthcare provider. Increasing levels of abstinence or contraceptives both improved biological outcomes, although the latter generated significantly higher costs.

Conclusion: Our results highlight the cost burden of poor SRH outcomes in adolescent girls in South Africa and demonstrate multisectoral provider costs changes and consequences in response to a CSE intervention. While further research is needed to explore ways to optimise CSE, our results can inform priority setting and resource allocation decisions.

Ind-1751 Empowering Emergency Response: A Comprehensive Costing Tool for Sexual and Reproductive Health Preparedness and Implementation

PRESENTER: **Frida Ngalesoni**, Muhimbili University of Health and Allied Sciences
AUTHOR: Patricia Mutai

The Minimum Initial Service Package (MISP) for Sexual and Reproductive Health (SRH) in Crisis Situations is a globally accepted set of priority objectives and essential SRH services designed to be implemented within 48 hours of an emergency's onset. Despite its integration into global health standards, many women and girls lack continued access to essential SRH services during crises due to fragmented emergency response efforts and insufficient budget planning for implementation of the MISP. PROPEL Adapt developed a MISP Costing Tool (the Tool) to support estimation of financial resources needed to implement the MISP to support stakeholders in planning and mobilizing financial resources for SRH services in crises thus enhancing preparedness and response efforts to ensure the continuity of essential SRH health services. The Tool's development process was collaborative, drawing on 11 key informant interviews with global experts as well as existing resources.

PROPEL Adapt gathered illustrative cost inputs from SRH in crisis stakeholders in both the Democratic Republic of the Congo and Ethiopia. The finalized Tool utilizes an activity-based costing approach to estimate the costs required for each of the 35 distinct sub-objectives and 72 activities within the MISP along with an additional area on MISP preparedness. The Tool is unique in its comprehensiveness as it covers all input costs associated with planning, coordination, and commodity logistics, storage and transportation, as well as preparedness actions such as policy development. While comprehensive, it maintains its simplicity, allowing for context adaptations in countries where previous preparedness work has already occurred. Lastly, the Tool estimates costs required to transition from crisis mode into providing comprehensive SRH services which are integrated into primary health care. In applying the Tool to the Ethiopian context, PROPEL Adapt estimated the total cost of implementing MISP at USD 1.41 million with the highest percentage of costs required to respond to the SRH needs of sexual violence survivors (28%). As expected, most of the commodities' related costs were associated with prevention of maternal and newborn mortality. In regards to resource requirements by cost category, running service delivery points - including health facilities, emergency camps, outreach and mobile clinics - accounted for 34% of the total costs. Once used, the Tool's cost estimates enable various stakeholders to assess the affordability, feasibility, and sustainability of the MISP while strengthening their preparedness and response efforts. The Tool can also support governments' stewardship and role in coordinating SRH in crisis response by equipping government decision makers with information to plan effectively and avoid duplication of activities. For instance, government stakeholders could use the individual MISP objective cost estimates to assign objectives to different implementing partners and provide them with budget envelopes. Similarly, the cost of health commodities outputs can be used to initiate discussions with the United Nations Population Fund or private sector entities regarding potential contributions to emergency SRH response efforts.

Ind-2646 Economic Evaluation of Trachomatous Trichiasis Surgery in Ethiopia

PRESENTER: **Amanuel Yigezu**

Background: Trachoma is the second most common cause of blindness in Ethiopia. Surgery to correct trachomatous trichiasis (TT) is a key intervention against trachoma. This study aims to estimate the costs and cost-effectiveness analysis (CEA) of TT surgery when compared to doing-nothing in Ethiopia in community settings. **Methods**: The costing was conducted from the healthcare provider's perspective. Micro-costing and top-down costing approaches were implemented to identify, measure, and value the resources used. Both capital and recurrent inputs were considered. Effectiveness was measured in Disability Adjusted Life Year (DALY). A Markov model, classified into five health states was built to estimate the incremental cost-effectiveness ratio (ICER). Both deterministic and probabilistic sensitivity analyses were performed by varying utilities and probabilities. All costs and effects were discounted by 3%. The willingness to pay threshold of Ethiopia's GDP per capita was used to evaluate the cost-effectiveness. **Results:** The cost of the TT surgery was US$ 31.90 per person. The ICER of TT surgery when compared to doing-nothing is US$ 12.73 per DALY averted from the healthcare provider perspective. A sensitivity analysis from a broader societal perspective indicated that the TT surgery costs less and averts more DALYs than the do-nothing scenario. Variability in other input parameters did not impact the overall cost-effectiveness of the intervention. **Conclusion:** TT surgery is a very cost-effective intervention in Ethiopia in community settings. **Keywords**: Blindness, Cost-Effectiveness Economic Evaluation, Trachoma, Trachomathous Trichiasis Surgery, Visual impairment

Ind-32 Cost-Effectiveness of Integrated Maternal HIV, Syphilis, and Hepatitis B Screening Opt-out Strategies in Nepal: a Modelling Study

PRESENTER: **Kasim Allel**, Centre for Global Health Economics, UCL
AUTHORS: Lucie Sabin, Hassan Haghparast-Bidgoli, Ghanshyam Gautam, Naomi Saville

Background and objective:

Every year, a significant number of infants are born with HIV, syphilis, and hepatitis B, transmitted by their mothers during pregnancy or childbirth. The World Health Organisation (WHO) developed a comprehensive framework encouraging an integrated and coordinated approach to achieve triple elimination of vertical transmission of HIV, syphilis, and hepatitis B in Asia. Integrated antenatal screening, which allows pregnant women to be screened for the three diseases during a single blood draw during the first antenatal care (ANC) visit offers a promising approach to enhance early diagnosis and timely treatment. However, evidence on the cost-effectiveness of integrated antenatal screening for HIV, syphilis and hepatitis B remains limited.

Although the prevalence is relatively low in Nepal, vertical transmission of these infections continues to be a critical public health concern. Current screening practices in Nepal show significantly lower coverage for syphilis and hepatitis B compared to HIV suggesting potential for integration. Given the constraints of limited resources and the need for prioritisation, determining the most cost-effective strategies for integrated antenatal screening is crucial. In this study, we aimed to model the cost-effectiveness of triple screening during antenatal care in Nepal.

Methods:

We modelled maternal HIV, hepatitis B and syphilis cascade of care and their corresponding disease states using disease-specific Markov models over a 20-year horizon with a cycle length of one year. We assumed screening occurred at the first antenatal care visit following an opt-out strategy, with subsequent treatment initiated promptly for disease-positive women. We compared dual integrated screening for HIV and syphilis and triple integrated screening for HIV, syphilis and hepatitis B with HIV screening only (status quo). Costs were estimated from a provider's perspective. Key indicators for effectiveness included number of new infections, number of disease-related adverse events, number of person-years living with the diseases and number of diseases-related deaths. Results were presented as cost per disability-adjusted life year (DALYs) averted. Deterministic and probabilistic sensitivity analyses were conducted.

Results:

Our modelling analysis of 752,506 pregnant women showed that integrated dual antenatal screening for HIV and syphilis was highly cost-effective, with an incremental cost effectiveness ratio (ICER) of $66 compared with the current strategy of screening for HIV only. Similarly, integrated triple screening was cost-effective, with an ICER of $150 compared to HIV screening only. However, when triple screening was compared to dual screening for HIV and syphilis, the ICER was $5,029, higher than Nepal's willingness-to-pay threshold. Nevertheless, 61% of the probabilistic sensitivity analysis estimates for triple screening were cost-effective.

Discussion:

Our results support WHO recommendations for the implementation of integrated triple prenatal screening in Nepal and Asia more broadly. The current development of integrated rapid screening kits for HIV, syphilis and hepatitis B will reinforce the feasibility and practicality of adopting this integrated approach. However, successful integration will require effective, high-quality ANC services supported with necessary human resources, facilities and supplies.

5 keywords: economic evaluation,* sexually transmitted disease, integrated antenatal screening, Nepal, modelling.

Ind-613 Estimating the Costs of Interventions to Reduce Anaemia in 193 Countries.

PRESENTER: **Tori Oliver**
AUTHORS: Yingying Wang, Robin Blythe, Natalie Carvalho, Sumie Leung, Clare Glover-Wright, Jacinta Holloway-Brown, Sant-Rayn Pasricha, Michael Bode

Background

Anaemia remains a significant public health issue impacting an estimated 1.92 billion people worldwide, with a disproportionate distribution of this burden falling on children and women of reproductive age. The past decade has brought only marginal gains towards addressing the global burden of anaemia, with no country on track to meet the Sustainable Development Goal target of a 50% reduction in anaemia prevalence in women of reproductive age by 2030. Prioritisation of cost-effective anaemia reduction strategies worldwide will be critical for making progress towards current and future targets and relies on robust estimates of the costs of available interventions. Published studies and tools estimating these costs typically focus on a single or limited number of interventions and country settings, with much variation in the methodological approach and types of costs included. This limits opportunities for global modelling of cost-effectiveness and total resourcing requirements using data that are comparable between interventions and country settings.

Research Aim

To develop a consistent methodology and complete set of data inputs for estimating country-specific unit costs for all interventions recommended by the World Health Organization (WHO) for reducing the burden of anaemia in women of reproductive age.

Detailed Methods

An Excel-based tool was developed to facilitate a micro-costing approach to estimating unit costs (per person receiving an intervention) for six WHO-recommended anaemia prevention and treatment interventions in 193 United Nations member states. A modified healthcare sector perspective and 1-year timeframe were adopted. Cost categories for each intervention included the commodity, supply chain, service delivery and administrative program costs. Quantities of resources for each cost category (e.g. number of tablets) were estimated based on WHO guidelines. The costs of each resource were estimated using secondary data sources. The impacts of uncertainty in parameter estimates were explored using one-way sensitivity analysis. Costs are presented in 2023 United States dollars (USD).

Key Results

In most countries, staple food fortification (rice and/or maize flour) was the lowest cost intervention, with a population-weighted average unit cost ranging from 0.41 USD in low-income countries to 1.48 USD in high-income countries per person per year. Multiple micronutrient supplements (MMS) generally had the highest unit cost, ranging from 9.58 USD (low-income countries) to 135.60 USD (high income countries). In high income countries, service delivery costs represented the largest component of unit costs for most interventions except for insecticide-treated bed nets and MMS (where commodity cost was the largest component). Program costs were the largest component of unit costs for several interventions in low-income countries. Uncertainty in commodity costs had the largest impact on overall unit costs for most interventions in most countries, followed by service delivery costs, particularly in high-income countries.

Conclusions and Implications

We developed a standardised methodology to estimate unit costs and understand cost drivers for WHO-recommended anaemia interventions in 193 countries. As the international community looks towards setting the next agenda for addressing anaemia, this work can help build a global evidence-base to guide investments in cost-effective interventions for reducing anaemia in women of reproductive age.

Ind-1034 Navigating Transition to Home: Resource Use and Cost Comparison of Nurse Navigator Support for Caregivers of High-Risk Infants Post-NICU

PRESENTER: **Myla Moretti**
AUTHORS: Julia Orkin, Kayla Esser, Wendy J Ungar, Jennifer Zwicker, Eyal Cohen, Vercancy Wu

Background: Infants in the neonatal intensive care unit (NICU) often require specialized post-discharge care involving primary care providers, medical sub-specialists, and allied health professionals, resulting in substantial healthcare resource utilization and costs. The Coached, Coordinated, Enhanced Neonatal Transition (CCENT) program is an innovative bundled intervention delivered by a nurse navigator to support caregivers of high-risk infants transitioning from the NICU to home, and during the first year of life.

Objective: The primary objective was to compare the frequency and associated costs of healthcare resource use between those high-risk infants and their caregivers who were assigned the CCENT intervention with those receiving standard care in the first year following NICU discharge.

Methods: This is an economic evaluation conducted alongside a randomized controlled trial conducted at seven Level III NICUs in Canada. Healthcare resource use and cost data were collected using a structured Resource Use Questionnaire (RUQ), administered to caregivers at 4 months (RUQ4) and 12 months (RUQ12) after discharge, post-randomization. Cost analysis involved estimating total and average costs per service provider type for each group, using summary statistics for counts and mean resource utilization.

Results: A total of 275 caregivers (290 infants) participated in the study. Resource use data were obtained from 202 caregivers who completed at least one RUQ, and cost analysis was conducted using data from 117 caregivers who completed both RUQs. Among those completing RUQ4, 91***% (n=** *68) of caregivers in the CCENT group reported one or more visits with a primary care provider compared to 95***% (n=79***) in the standard care group; at RUQ12, these figures were 89***% (n=**70) for CCENT and 90**% (n=**74) for standard care. For medical sub-specialist visits, 56**% (n=**42) of caregivers in the CCENT group reported visits at RUQ4 compared to 52**% (n=**43) in standard care; at RUQ12, these figures were 58**% (n=**46) for CCENT and 62**% (n=**51) for standard care. Similarly, visits to allied health professionals were reported by 52**% (n=**39) of caregivers in the CCENT group at RUQ4 compared to 37**% (n=**31) in standard care, with results for RUQ12 showing 37**% (n=***29) and 34%(n=28), respectively. Cost analysis for the intervention and standard care groups is in progress and will assess the economic implications of the CCENT program from both a healthcare system and family perspective.

Conclusions: This study is the first in Canada to provide a comparative analysis of healthcare resource use and costs for high-risk infants and their caregivers post-NICU discharge. High utilization across provider types in both groups underscores the complex medical needs and potential financial burden on caregivers. Although cost results are forthcoming, initial findings suggest that coordinated transitional care interventions like CCENT may help address these challenges. This research offers valuable insights for health policy aimed at supporting caregivers navigating medical needs for their high-risk neonatal population.

Ind-1287 Economic Evaluation of User Fee Exemption Policies: Evidence from a Cost-Effectiveness Analysis for Children Under Five in Burkina Faso

PRESENTER: **Thit Thit Aye**, Heidelberg Institute of Global Health, University Hospital and Medical Faculty, Heidelberg University
AUTHORS: Hoa Thi Nguyen, Laurène Petitfour, Valery Ridde, Aleksandra Torbica, Emmanuel Bonnet, Mariam Seynou, Mr. Joël Arthur Kiendrébéogo, Ali Sie, Ms. Manuela De Allegri

Background: Use fee exemption policies have emerged as a health financing strategy to improve financial access to essential healthcare services by eliminating direct payment at the point of care in Sub-Saharan Africa. While substantial research has investigated the effects of user fee exemption policies on service utilization, very few studies have assessed the relative costs and effects of these policies for children under five. This gap in economic evidence limits our understanding of the value of user fee exemption policies and our ability to make optimal decisions in resource allocation.

Aim: This study aimed to evaluate the cost-effectiveness of Burkina Faso's national free healthcare policy, which eliminated user fees for pregnant women and children under five as of 2016. Specifically, our analysis focused on common childhood illnesses of children under five and estimated the relative costs and effects of the policy compared to the baseline condition prior to its implementation.

Method: We developed a single decision tree model to assess the cost-effectiveness of the policy from its onset in 2016 until 2021 from a health system perspective. Inputs for model parameters were obtained from various data sources, including the model effect estimate on service utilization from own impact assessment, cost estimates from the Ministry of Health's reimbursement data and our micro-costing study, and disease parameters from peer-reviewed existing literature. We selected 2021 as the reference year and converted costs from the preceding years to the reference year. Given the acute nature of childhood illnesses and considering mortality constituted a major portion of the disease burden for children under five, we utilized Life Years Saved (LYs) as the primary outcome measure for the cost-effectiveness analysis. A standard annual discounting rate of 3% was applied to determine the effects. We conducted a deterministic analysis to determine the incremental cost-effectiveness ratio (ICER) per life-year saved. Additionally, we performed a series of one-way sensitivity analyses, a probabilistic sensitivity analysis (PSA), and scenario analyses to investigate the robustness of the results.

Result: The average service provision costs for a child were $6.91 without the policy and $8.94 with the policy. The service utilization had a cumulative average increase of 28.57%. Our preliminary analysis showed that the free healthcare policy was associated with an incremental cost of $2.03 and a discounted incremental effect of 0.019 life-years saved per child, compared to the baseline condition. These values resulted in an ICER of $108.72 per life-year saved, about 14% of the country's GDP per capita in 2021 (~$794).

Conclusion and Implications: Our deterministic findings suggest that user fee exemption policies for children under five are likely cost-effective. Yet, the result should be interpreted with caution, due to the context-specific uncertainties.

Ind-2395 Economic Evaluation of a Care Coordination Program for Families of Children with Medical Complexity

PRESENTER: **Myla Moretti**
AUTHORS: Samantha Quartarone, Londgi Fu, Nora Fayed, Sima Gandhi, Eyal Cohen

Background: Children with medical complexity (CMC), particularly those who are medically fragile and/or technology-dependent, often experience fragmented care and frequent hospitalizations. The Complex Care for Kids Ontario (CCKO) intervention aims to address these challenges through intensive care coordination delivered by a team led by a nurse practitioner.

Objective: This study evaluates the cost-effectiveness of the CCKO intervention compared to standard care in reducing emergency room visits from both health care system and societal perspectives.

Methods: A cost-effectiveness analysis was conducted alongside the clinical trial of CCKO, which used a waitlist variation of a randomized controlled design. A cohort model was constructed with parameter estimates, costs and ranges for sensitivity analyses derived from the clinical study. Incremental costs were compared to incremental changes in mean emergency room visits over a 12-month time horizon expressed as the incremental cost-effectiveness ratio (ICER).

Perspectives: This analysis will be performed from both a health care system and societal perspective.

Costs: Direct costs included the intervention itself and all health service use during a one-year follow-up period. Health system costs were obtained from administrative data sets (ICES). Additional health services use such as those covered by third-party payers and caregiver out-of-pocket expenses were obtained by direct interview with caregivers. Indirect costs, such as caregiver lost productivity were also recorded during caregiver interviews at multiple time points during the study period.

Outcome Measure: The primary effect measure of this economic evaluation was mean emergency room visits. Total inpatient days will be evaluated as a secondary effect measure.

Results: Intervention costs were $6500 per patient, derived from program budget, nurse practitioner case loads and total patient years accumulated during the trial. The preliminary analysis suggests there was no significant difference in mean emergency room visits over the 12-month time horizon, and as such, a cost-comparison approach was employed in this analysis. From a health system perspective, total costs in the intervention group were $73,384 CAD and in the waitlist control group $69,499, with an incremental cost of $3,885 higher in the intervention group. Incorporation of caregiver lost productivity costs is ongoing, as is sensitivity analysis to assess the robustness of these results. Further scenario analyses will also be performed to determine impacts of COVID-19 restrictions which may have limited health care utilization in the later part of the study time horizon.

Conclusion: Preliminary findings suggest that, although the CCKO intervention was not cost-saving over a short time horizon and did not appear to reduce emergency room visits, its costs may represent good value for money in addressing patient and family needs. The increasing complexity of care and burden on families suggests that a navigator may be a valuable resource, potentially leading to improved care coordination for these children and their caregivers. Further analyses over a longer time horizon are warranted to determine the intervention's potential impacts and benefits.

Ind-1203 Impact of National Health Mission on Maternal and Child Health Outcomes: An Interrupted Time Series Analysis Supplemented with Evidence of Inequity

PRESENTER: **Dr. Abinash Singh, PhD**
AUTHOR: Sukumar Vellakkal

India launched National Health Mission (NHM) in 2005 to reduce maternal and child mortality by providing equitable, affordable, and quality healthcare services. Studies assessing the impact of National Health Mission (NHM) were skewed towards the uptake of maternal and child health (MCH) services, with sparse evidence on related health outcomes at population level. Using annual time series data, we estimated the population level (intention-to-treat effect) impact of the NHM on MCH outcomes such as Infant Mortality Rate (IMR), stillbirth, Neonatal Mortality Rate (NMR), and Maternal Mortality Ratio (MMR). Our results exhibit a strong consensus of positive impact on IMR in the post-NHM period, with an additional annual decline of 0.49 deaths per 1000 livebirths in its rate and 0.3 deaths per 1000 livebirths in its regional differences. On the flip side, we find only a moderate impact on stillbirth and an insignificant impact on NMR and MMR. Further, a saturation effect in the impact with no significant change in the trend was observed after the targeted full implementation year of 2011-12, for all the MCH outcomes. Subsequently, using nationally representative individual sample data, we estimated the socioeconomic inequity in MCH outcomes in the pre- and post-NHM periods and found that the inequity disfavoring the poor still prevalent, however, there was considerable decline in the post-NHM period, where the highest decline was noticed for infant mortality: concentration index: -0.14, (P=0.000) in 2002-04 to concentration index: -0.082, (P=0.000) in 2019-21. Overall, NHM had a moderate impact on MCH outcomes with considerable variation across the states and MCH indicators. Our findings inform policy decisions for strengthening public health system to reduce pervasive socioeconomic inequity and amplify the positive gains on MCH outcomes.

Keywords: *National Health Mission, Maternal and child health outcomes, Interrupted time series design, Socioeconomic inequity*

Bali International Convention Centre – Bandung

Food for Thought: Economics of Food Focussed Interventions

MODERATOR: **Auliya A. Suwantika**, Universitas Padjadjaran

Ind-141 Health Economic Evaluations of Immunotherapy and Biologics for Food Allergy Management: A Systematic Review

PRESENTER: **Dr. Andrew Fong, MD MHLM**
AUTHORS: Joshua Jacob, Jennifer Protudjer, Melanie Lloyd, Liz Thyer, Peter Hsu, Lei Si

Background: Food allergy is a significant public health concern with substantial economic costs, including the cost of treatment, healthcare service utilisation and carers' time. These economic costs of food allergy are borne by food allergic individuals, their families and the community more broadly. With the development of novel therapeutic approaches and evolving discussions around allergy management, there are multiple knowledge gaps on the cost-effectiveness of the various treatments available.

Methods: The aim of this systematic review was to identify and synthesise health economic evaluation studies on the use of immunotherapy and biologics in food allergy management. A comprehensive literature search was applied to databases including Medline, Cochrane Library and Scopus. Additional 'grey' literature was also reviewed. Studies undertaking an economic evaluation were included. Cost-effectiveness measures, including cost per quality-adjusted life year, incremental cost-effectiveness ratio (ICER) and net monetary benefit were extracted. The reporting quality of studies was assessed using the validated CHEERS checklist. Key outcomes and model inputs and design were collated, synthesised and reported descriptively.

Results: 2065 unique papers were identified. Independent screening by two researchers included 8 full text studies. 7 related to immunotherapy, and 1 reporting on biologics. Despite the heterogeneity of country of origin and thus health systems, most cost-effectiveness studies were modelled on a young child with peanut allergy. 5 studies were from the US context, with representation also from Australia, the UK and Canada.

Overall, commercial forms of oral immunotherapy and epicutaneous immunotherapy were shown to not be cost-effective in the US (ICER US$88,000/QALY gained & US$216,000/QALY gained respectively). In the UK, excluding the cost of clinician consultations, monitoring and follow-up associated with the administration of treatments, the UK National Institute for Health and Care Excellence (NICE) expressed that commercial peanut oral immunotherapy could be considered as acceptable for cost-effectiveness under the NHS. The preferred ICER following NICE assessment was £36,565/QALY.

In comparison, a non-commercial peanut oral immunotherapy for pre-school aged children using store-bought peanut flour was assessed as cost-effective in the US & Canadian contexts and was the dominant treatment option compared to avoidance. Similarly, an Australian study showed that a probiotic peanut oral immunotherapy is cost-effective compared to no treatment (ICER A$19,386/QALY gained).

For Omalizumab, in the base case and at current pricing, Omalizumab was not cost-effective as a sole food allergy treatment (family-level cohort ICER analysis $185,183/QALY gained). With sensitivity analysis, cost-effectiveness may be achieved at a lower retail price or when larger health utility shifts are apparent.

The reporting quality of these studies was appropriate and comparable between studies, although there was no discussion of the distributional effects and minimal engagement with the food allergy population.

Conclusions: These results conclude that the various commercial forms of immunotherapy available are generally not cost-effective, whilst non-commercial forms of oral immunotherapy have evidence for cost-effectiveness. At present, omalizumab is not currently cost-effective as a monotherapy for food allergy. We anticipate these findings will assist clinicians when prescribing immunotherapy and biologics and highlight areas of improvement for existing models of care.

Ind-698 Implementation of National Food Safety Standard Maximum Levels for Listeria Monocytogenes: Cost-benefit Analysis of a Public Sector Decision

PRESENTER: **Yi Li**
AUTHORS: Guoxiang Liu, Xin Zhang

Background Microbial contamination causes foodborne illness, and Listeria monocytogenes (L. monocytogenes) is the main foodborne pathogen. In 2021, China issued a new food safety standard that L. monocytogenes is prohibited in frozen drinks. This study aims to assist the national food safety department in formulating or changing regulations and policies, adjusting budgets, and guiding the development of the food industry. **Methods** We conducted a cost-benefit analysis for the implementation of food safety standard from societal perspective. The decision tree, willingness-to-pay, and value of statistical life were used to estimate health gains. Delphi technique, survey, and activity-based costing were used to estimate costs of government and enterprises. The outcome measure was Benefit-Cost Ratio (BCR). Costs and health outcomes were discounted to 2021. Parameters for one-way deterministic sensitivity analysis included the foodborne proportion of listeriosis in children under 5 years of age, pregnant women, and people aged 5-65 years and over 65 years, and etc. The data were driven from Chinese industrial enterprises database, field surveys, censuses, and etc. **Results** In 2021, there were about 3532 listeriosis cases in China, with health gains of

¥128,863,325.65 ($19,975,713.17). The compliance costs of government and enterprises were ¥9,163,833.75 ($1,420,529.18) and ¥22,877,454.88 ($3,546,342.41), respectively, and the BCR was 4.02. Sensitivity analysis showed that all parameters influenced little on the BCR, and the implementation was always cost beneficial. **Conclusion** In China, the health gains of implementation of national food safety standard maximum levels for L. monocytogenes in frozen drinks outweigh the compliance costs of government and enterprises. **Keywords** Listeria monocytogenes, Food safety regulation, China, cost-benefit analysis, decision tree model

Ind-1666 Equity Impacts and Cost-effectiveness of Salt Substitutes for Disease Prevention in Indonesia

PRESENTER: **Leopold Aminde**

AUTHORS: Nunik Kusumawardani, Wahyu Pudji Nugraheni, Santi Martini, Tety Rachmawati, Rofingatul Mubasyiroh, Febi Dwirahmadi, Mr. Lennert Veerman

Background: High blood pressure affects more than one in three Indonesians, and it is a major risk factor for heart disease, stroke and kidney disease. Growing evidence from pragmatic trials suggests that low-sodium potassium-enriched salt substitutes (LSSS) – containing 75% sodium chloride and 25% potassium chloride – are effective in lowering blood pressure (BP). However, there is limited research on the impacts of these LSSS in Indonesia. This study aimed to investigate the potential health impacts and cost-effectiveness of LSSS in Indonesia.

Methods: We developed a mathematical simulation model using the proportional multistate lifetable Markov framework to assess a government-led strategy that gradually switches the current regular salt (100% sodium chloride) consumed in the country to LSSS alternatives. BP distribution data were obtained from the Indonesian Basic Health Research Survey (RISKESDAS 2018), while baseline disease incidence, case fatality and disability rates were from the Global Burden of Disease 2019 study. The dose-response effects of LSSS on BP were derived from meta-analyses of randomized trials, while relative risk functions were used to estimate the effects of BP changes on incident disease. Changes in disease events and gains in life years, healthcare costs and policy implementation costs, and incremental cost-effectiveness ratios were estimated from a health system perspective. Outcomes were simulated for the population alive in 2019 overall, and by income quintiles. A discount rate of 3% was applied for health and economic outcomes. The relative concentration index was used to estimate health equity impacts. Uncertainty was assessed using probabilistic sensitivity analysis.

Results: A government policy to gradually replace regular salt with LSSS over a 10-year period could avert 1.5 million incident cardiovascular disease events and 643,000 new cases of chronic kidney disease in Indonesia. In addition, over 200,000 CVD and CKD deaths could be postponed. Over the lifetime of the Indonesian population, this could result in 24.6 million health-adjusted life years (HALYs) gained. This salt switch is predicted to reduce cardiovascular-related health inequalities (concentration index, -0.075, 95%CI: -0.088 to -0.062). The projected policy implementation salt reformulation costs (US$ 1.2 billion [Indonesian Rupiah (IDR) 17.2 trillion], as of July 2019) were outweighed by the net savings in health expenditure (~US$ 2 billion [IDR 27.7 trillion]) due to reduced disease cases. After accounting for healthcare expenditures from added years of life due to the intervention, LSSS were dominant (cost-saving) over the lifetime, and very cost-effective even with a high LSSS price.

Conclusion: This analysis demonstrates that a switch from regular salt to LSSS alternatives could be a cost-saving strategy to prevent chronic disease and reduce health inequalities in Indonesia.

Ind-2843 Estimating The Relationship Between Knowledge of The Negative Externalities of Antibiotic Consumption and Willingness to Pay For Antibiotic-Free Food

PRESENTER: **Melisa Williams Higgins**

Background

The widespread use of antibiotics in food–producing animals, particularly those deemed medically important to humans, is one of the mechanisms for increased resistance in humans. This is more concerning given recent evidence of a direct causal link between antibiotic consumption in animals and resistance in humans. Individuals aware of this should have an increased demand, that is higher willingness to pay (WTP), for foods produced with appropriate antibiotic methods compared to other foods.

Research aims

This paper aims to estimate respondents' WTP to forgo antibiotic use in the foods they consume and identify if this WTP is affected by their knowledge of antibiotic consumption and resistance. This is the first study to investigate whether knowledge has a causal impact on WTP for antibiotic-free food.

Methodology

I conducted a survey in October 2019 with 523 UK residents to collect primary data. The survey included a choice experiment, using the sequential bid contingent valuation method, from which I calculated the individual's willingness to pay for the antibiotic–free option for the most-purchased and least-purchased good (of chicken, seafood, and legumes). I assumed that each respondent has a single willingness to pay value, and that the responses in the experiment were driven by this single value. The intervals are completely exogenously determined as only the interval bounds containing the respondent's true WTP is observed.

For each respondent, I calculated a knowledge index by summing the number of correct responses to the knowledge questions which tested the respondents' awareness of resistance, and knowledge of antibiotic use in humans and food production. To ensure robustness of the results, knowledge is also measured using a subset of the questions including the use of antibiotics in food production, and a Principal Component Analysis which reports the most important knowledge variable for each respondent.

For the estimation I use interval regression, as the data is censored, and linear regression using the WTP interval midpoint as a proxy for the true WTP.

Results

On average the WTP for the antibiotic–free option (compared to the regular option) is 57% higher for the most–purchased protein and 52% higher for the least–purchased protein. Additionally, knowledge has a positive and significant effect on WTP for the most–purchased protein, which is robust to different specifications, and positive but non–significant effect for the least–purchased. The interval regression estimates suggest that the WTP for the most–purchased antibiotic–free good increases by approximately £0.085 (a 5% increase relative to the mean) for each one standard deviation increase in the knowledge index (OLS results are very similar).

Conclusion

The findings suggest that consumer WTP for antibiotic avoidance is non–trivial, the WTP is over 50% higher than the price of the regular option even for the least-purchased protein and may justify government regulation over the use of antibiotics in food production. The knowledge index calculated was low (less than 50% in most cases) suggesting that even with low levels of knowledge, respondents would still prefer foods produced without antibiotics.

1:30 PM –3:00 PM WEDNESDAY [Demand & Utilization Of Health Services]

Bali International Convention Centre – Jakarta B

Equity in the Utilisation of Health Services

MODERATOR: **Rifkatu Nghargbu**,

Ind-110 Utilization of Inpatient Health Services for DM Patients of JKN Participants in Referral Health Facility in Indonesia

PRESENTER: **Erfan Chandra Nugraha**
AUTHORS: Pujiyanto Pujiyanto, Vetty Yulianty

The number of participants suffering from diabetes mellitus (DM) in Indonesia continues to increase and is becoming a burden in financing the National Health Insurance (JKN) program. Access to health services by DM patients participating in JKN at Advanced Level Referral Health Facilities (FKRTL) is seen as only being utilized by certain membership segments. Apart from that, various factors influence access to health services at secondary-level referral health facilities. This study aims to analyze the use of health services by DM patients participating in JKN based on membership type and examine the determinants of health service use at the inpatient level. This research uses secondary data in the form of 2022 DM contextual BPJS Kesehatan sample data. The data was analyzed univariately, bivariately, and multivariately with the Zero Inflated Negative Binomial regression model. The results of statistical tests show that the level of hospitalization, age, treatment class and province of participants significantly differ in the use of health services. in inpatient care based on predisposing factors, namely age and enabling factors, namely treatment class and participant provincial/regional variables which are significantly related to service utilization, Lampung Province is the region with the largest inpatient utilization 1.1 times compared to Aceh Province, meanwhile type Participation in the JKN program does not have a significant effect on inpatient services. Keywords: Utilization of health services, inpatient care, national health insurance participants, diabetes mellitus, sample data

Ind-240 Health Service Utilization Equity in Less Developed Areas of China: Evidence from Gansu Province

PRESENTER: **Jiaxian Zhou**
AUTHORS: Jie Lu, Jianmiao Li, Xin Gao, Shuyi Li, Xiaobin Hu, Shengxin Tao, Xi Chen, Xuhong Pu, Ningwen Mao

Objective Equity is a key issue in the utilization of health services. All countries in the world are constantly exploring the reform of health system to promote the equality of residents' utilization of health services. However, previous studies have shown that there are still great inequities in the utilization of health services among different residents, especially in some economically underdeveloped areas. The purpose of this study is to explore the equity of health service utilization and its influencing factors among residents of less developed regions, and to provide reference and policy recommendations for the effectiveness of the new round of health care system reform in China. **Mathods** Taking the data of the 7th National Health Service Survey in Gansu Province as an example, based on Anderson model, the equity of health service utilization and its influencing factors were evaluated by using the centralized index (CI) and its decomposition method. On this basis, it screened out patients who had used outpatient or inpatient services from the survey subjects, and extracted their out-of-pocket payments (OOPs) incurred by using the above services. Recentered influence functions (RIF) regression and its decomposition method were used to analyze the equity difference of health service utilization level between urban and rural residents, and the contributing factors were discussed. **Result** The CI of outpatient service utilization (two-week visit rate) was 0.0422 and -0.0268, and the CI of inpatient service utilization (hospitalization rate) was 0.1462 and -0.1294, respectively. The utilization of both outpatient and inpatient services tends to be high income residents in cities, while in rural areas, the lower the economic level of residents, the higher the utilization rate. Further analysis of the level of health service utilization showed that the Gini coefficients of OOPs for urban and rural patients were 0.703 and 0.748, respectively, indicating a large inequality. RIF regression and its decomposition results show that rural patients have greater inequality than urban patients in OOPs for out-patient and in-patientcare, and there is discrimination effect. **Conclusion** At present, there are still inequities in the utilization of health

services in less developed areas of China, especially in the utilization of hospitalization services, but the degree of inequity is reduced compared with previous studies. In terms of the fairness of health service utilization level, the inequality degree of rural residents is greater than that of urban residents, and there is a greater discrimination effect. This finding suggests that it needs to develop and implement health equity policies for rural residents to ensure that they are not discriminated against in their access to health services. Equity in the utilization of health services is also monitored and evaluated to ensure the effectiveness of the policies and equal treatment in their implementation. **Keywords**** Less developed areas, Utilization of health service, Anderson Model, Concentration index, Gini coefficient, RIF regression

Ind-1538 Climate Extremes and Antenatal Care Utilization: an Interrupted Time Series Analysis of the 2010 Palmares Floods

PRESENTER: **Ivan Augusto Cecilio e Silva**
AUTHORS: Cassia Favoretto, Letícia Xander, Everton Nunes da Silva, Giacomo Balbinotto, Josephine Borghi

Background: Floods severely disrupt healthcare systems, damaging infrastructure, interrupting utility services, and affecting healthcare workers' availability. These disruptions hinder essential services, including antenatal care (ANC), often used as a proxy for overall healthcare accessibility. Simultaneously, floods can reduce healthcare demand, as families prioritize immediate needs like shelter and food. Economic losses further diminish the capacity to afford healthcare, even in theoretically free systems. Despite growing awareness, the impact of floods on maternal and child healthcare (MCH) systems, particularly in lower-middle-income countries (LMICs), remains understudied. **Objective:** This study investigates the immediate and long-term effects of the June 2010 floods in Palmares, Pernambuco, Brazil, on MCH systems, focusing on ANC utilization patterns. It aims to fill a research gap by providing empirical evidence on flood-induced disruptions in healthcare services in a middle-income setting in South America. **Methods:** Using an interrupted time-series analysis, we examined 90,337 individual birth records from the Information System on Live Births (SINASC) between 2000 and 2019. ANC data were classified into three categories: ≥1, ≥4, and ≥7 visits during pregnancy. Records with incomplete ANC data (0.34%) were excluded. The intervention period began the week following the flood (June 20, 2010). We integrated disaster data from the Integrated System of Information on Disasters (S2iD) to link environmental events with healthcare metrics. Data were aggregated weekly, capturing consistent trends. **Results:** The floods caused significant disruptions to ANC utilization, with the most pronounced decline observed in the highest frequency category (ANC ≥7). Post-flood, utilization rates gradually recovered. However, trends varied: while ANC ≥1 and ≥4 showed slower recovery rates, ANC ≥7 demonstrated a faster rebound with a positive trend shift. These findings highlight both the vulnerability and resilience of ANC systems under disaster conditions. **Conclusion:** Floods significantly disrupt ANC utilization, with varying recovery trajectories across care levels. These findings emphasize the need for integrating disaster preparedness into healthcare policy, particularly in LMICs prone to environmental shocks. Policymakers must prioritize adaptive measures to mitigate healthcare disruptions and enhance system resilience, ensuring equitable access to MCH services during and after disasters.

Ind-564 Weathering the Storm: Primary Care Delivery and Telehealth Utilization under Climate Shocks

PRESENTER: **Chunfeng Zhang**
AUTHORS: Ling Li, Xiang LI

This study explores the behavioral dynamics of primary care utilization in the context of climate change. By analyzing daily weather observations at the county level and approximately 20 million telehealth service records in 2023, we find that the impact of temperature shocks on primary care utilization exhibits a U-shaped curve, suggesting the presence of an optimal temperature zone. In contrast, the effect of precipitation shocks follows a J-shaped curve, indicating that the influence intensifies with increasing precipitation levels. The telehealth platform not only enhances accessibility to primary care but also fortifies its resilience, as waiting times remain relatively stable despite increased service volumes. We identify three mechanisms that underpin the resilience of the telehealth platform: the mobilization of available workforce across geographic regions, professional titles, and varying levels of affiliated hospitals. Telehealth platform functions as a form of quasi-insurance that can effectively pool and manage weather-related risks across different regions, leading to pareto improvements.
Keywords: Primary care, climate, weather, telehealth platform **JEL classification:** Q54, I10, L00 1

Ind-1085 Improving Access to Family Planning Services through Voucher Schemes in Punjab, Pakistan: Case Study from Rahim Yar Khan District

PRESENTER: **Dr Shabana Haider**
AUTHORS: Amna Akhsheed, Rahema Hasan

Background: Punjab province in Pakistan is home to 52% of the country's total population. With an estimated 127 million residents, it ranks as the 11th most populous region globally, surpassing nations like Germany (85 million), Japan (112 million), and Malaysia (34 million). The province's population is growing at a rapid rate of 2.53%, projected to reach 150 million by 2030. Efforts toward population control have plateaued over the past decade, with an unmet family planning need of 16%, particularly among marginalized populations and the lowest wealth quintiles in Pakistan. Amongst these women, 22.5% in the lowest wealth quintile have an unmet need for family planning, compared to 13.7% in the highest wealth quintile. Global and local evidence suggests that voucher programs can effectively expand contraceptive choices, overcome method-specific barriers, and make private healthcare providers accessible to disadvantaged clients who face constraints. This research study explores using vouchers as a tool for promoting family planning by the government in the district Rahim Yar Khan. The voucher scheme offered recipients free family planning services at designated public and private healthcare facilities, along with reimbursement for transportation costs, reducing financial, physical barriers and minimizing out-of-pocket costs.

Research Question: How did the implementation of the voucher scheme increase access to and uptake of family planning services in Rahim Yar Khan District, Punjab? What lessons can be learned from this scheme for scaling it up in other areas of Punjab?

Methodology: Our approach combines quantitative and qualitative assessments of secondary data related to provision of family planning services in the district Rahim Yar Khan between 2019 and 2021. We conducted a comprehensive literature review on the use of vouchers for family planning services. Project-related data, which included financial data, was obtained from the implementing agency, the Punjab Population Innovation Fund (PPIF). A rapid assessment of data collected during the implementation of the voucher scheme was conducted, which was then triangulated to draw inferences and conclusions.

Results and conclusion: The Government of Punjab financed the voucher scheme at a cost of PKR 85 million (USD 500,000)[^1], implementing it through a public-private partnership model. The scheme targeted 80,000 marginalized women registered in the national safety net institution in Rahim Yar Khan, of whom over 21,000 (add percentage here) availed free family planning services. The cost per beneficiary was PKR 4,500 (USD 26). The study results showed a 9.9% increase in the contraceptive prevalence rate (CPR) and a 4% reduction in the unmet need for family planning in Rahim Yar Khan district. Additionally, by the end of the project, 35% of individuals in the area who had never used contraceptives reported doing so. These findings demonstrate that vouchers can be an effective tool for improving access to and uptake of family planning services among poor and marginalized populations in Punjab and Pakistan overall. This research provides valuable insights into how enhancing access to free services and reducing financial barriers can drive higher demand for and utilization of health services.

[^1]: 1 USD = 170 PKR (average for 2020-21)

Ind-1363 Wealth-related Inequality in Antenatal Care Service Utilization: Evidence From Nepal Multiple Indictor Cluster Surveys 2014 and 2019

PRESENTER: **Suman Sapkota**
AUTHORS: Bipin Thapa, Amrita Gyawali, Yifei Hu

Antenatal care (ANC) is essential for improving maternal and neonatal health outcomes and its utilization can be affected by socioeconomic status. This study aims to assess the association between wealth-related inequality and ANC service utilization among Nepalese women using data from the nationally representative Nepal Multiple Indicator Cluster Survey (MICS) 2014 and MICS 2019. The analysis included 2,045 women from the MICS 2014 and 2,518 women from the MICS 2019 who gave birth to a child two years preceding the survey. The main outcome variables were receipt of recommended ANC visits, a binary variable, and total number of ANC visits, a count variable. Household wealth index was the independent variable, while women's sociodemographic, household, and settlement characteristics were the covariates. Using individual survey datasets from 2014 and 2019, along with pooled dataset of both surveys, we assessed the association of ANC service utilization with household wealth index using logistic regression and negative binomial regression models. We measured wealth-related inequality using concentration curves and concentration indices (CIx). The Erreygers-corrected method was used to calculate the concentration index for receipt of recommended ANC visits, whereas the generalized concentration index proposed by Wagstaff et al. was used to determine the CIx for the number of ANC visits. The proportion of women who received at least one ANC visit increased from 87.7% in 2014 to 95.5% in 2019. However, women in the highest wealth quintile were 4.78 [95% confidence interval (CI): 2·52, 9·04] times, 3.69 (95% CI: 1·76, 7·72) times and 4.52 (95% CI: 2.80, 7.29) times more likely to receive recommended ANC visits compared to those in the lowest quintile in 2014, 2019 and pooled analysis, respectively. Similarly, compared to being in the lowest wealth quintile, being in the highest wealth quintile increased the expected number of ANC visits by 63% (95% CI: 43%, 87%) in 2014, 41% (28%, 54%) in 2019, and 52% (95% CI: 1.4,1.65) in pooled analysis. Concentration curves revealed a decline in pro-rich inequality in both the receipt of recommended ANC visits and the number of ANC visits from 2014 to 2019, when there was a decline in the national multidimensional poverty index from 30.1% to 17.4%. Despite the decline in pro-rich inequality, the concentration curves and CIx showed that inequality persisted for over five years. The results indicated that for 2014 and 2019, the CIx values for receipt of recommended ANC visits were 0.352 and 0.175, respectively. Similarly, the CIx values for the number of ANC visits in 2014 and 2019 were 0.145 and 0.091, respectively. Our findings reveal wealth-related inequality in ANC service utilization among Nepalese women, with women from higher socioeconomic statuses having higher odds of receiving recommended ANC visits and a higher number of ANC visits. These findings underscore the need for concerted and continued efforts by stakeholders to improve access to and utilization of ANC services among disadvantaged populations in Nepal, particularly those from lower wealth quintiles.

Ind-688 Inequality in Health Service Utilization Among Middle-Aged and Elderly Hypertension Patients in Cold Region of China

PRESENTER: **Haofei Li**
AUTHORS: Lan Zhou, Weidong Huang

【**Objective**】The issue of inequality in the utilization of healthcare services remains a significant topic in the field of health. This study aims to investigate inequality in outpatient and inpatient service utilization among middle-aged and elderly hypertensive patients in cold regions of China, using Heilongjiang Province as an example, and to explore the driving factors behind this inequality. 【**Methods**】Based on the latest round of health service survey data from 2023, hypertensive patients aged ≥45 years in Heilongjiang Province were selected as the study population. The outpatient visit rate within two weeks and the annual hospitalization rate were used as indicators to describe their health service utilization status. The concentration index was used to measure the degree of inequality in outpatient and inpatient service utilization, and a logit model was further employed to decompose the concentration index, identifying key influencing factors behind the inequality. 【**Results**】The two-week outpatient visit rate and the annual hospitalization rate of middle-aged and elderly hypertensive patients in Heilongjiang Province were 16.45% and 18.66%, respectively. The concentration indices for outpatient and inpatient service utilization were 0.0055 and 0.0537, respectively, indicating pro-rich inequality. Household economic status (Percentage contribution:150.45% and 61.71%), multimorbidity (Percentage contribution:131.48% and 57.75%), and family size (Percentage contribution:18.63% and 1.23%) were the main factors driving inequality in outpatient and inpatient service utilization. Patient age had a positive effect on outpatient utilization inequality, with a contribution rate of 55.89%. Additionally, participation in basic medical insurance (Percentage contribution: -3.18% and -8.09%), employment (Percentage

contribution: -191.67% and -0.56%), and education level (Percentage contribution: -39.32% and -17.77%) alleviated pro-rich inequality in outpatient and inpatient service utilization to varying degrees. 【**Conclusion**】There is pro-rich inequality in health service utilization among hypertensive patients in cold regions of China, particularly in inpatient services. Therefore, efforts should be made to further improve the social security system to ensure that the healthcare needs of low-income groups are fully met. 【**Keywords**】Hypertension, Health service utilization, Inequality, Cold regions

Ind-1353 Poverty and Intersecting Inequities in Health Service Access and Utilization in Nepal: Insights From Nationally Representative Surveys

PRESENTER: **Achyut Raj Pandey**
AUTHORS: Suman Sapkota, Kjell Arne Johansson, Krishna Kumar Aryal, Shiva Raj Adhikari

Background: Physical accessibility to health facilities significantly impacts healthcare utilization, particularly in countries like Nepal with sparse distribution of facilities, difficult geographical terrain and limited access to means of transportation. Inequitable facility expansion exacerbates disparities, especially among those facing poverty, rural residence, and challenging terrains. These inequities deepen with overlapping or multiple deprivation thus challenging the health system goal of equitable access to and utilization of health services. In this context, this study analyses intersecting inequities in healthcare access, and utilization which could provide insights in equitable expansion of health infrastructures. **Methods**: We analyzed data from the nationally representative Living Standard Survey 2023 (9,600 households) and the Demographic and Health Survey 2022 (14,845 households). Participants in both surveys were selected using a multi-stage random sampling process. Accounting for the complex survey design, we assessed the intersections of poverty, province, and urban/rural settings. We examined inequities in physical access to health facilities by analyzing travel time and distance to health facility, and utilization by self-reported adequacy of health service utilization. Descriptive bivariate analysis and logistic regression were performed using R programming software. **Findings**: Poor individuals face greater barriers to healthcare access compared to non-poor populations. The median distance to the nearest health facility was 3.61 km for the poor, compared to 2.74 km for the non-poor. Rural residents travel an average of 4.2 km, nearly double the distance of urban residents (2.33 km). Only 26.8% of poor individuals can reach a government hospital within 30 minutes, compared to 47.3% of the non-poor. This disparity increase in magnitude when poverty status intersects with urban rural setting: 11.7% of poor rural residents access a hospital within 30 minutes, versus 58.8% of non-poor urban residents. The disparities are even more pronounced with intersection of three variables: poverty, urban rural setting and province. In Lumbini province, 67% of non-poor urban residents can reach a hospital within 30 minutes, while none of the poor rural residents in Bagmati province can. Access to basic health facilities ranges from 32% among poor rural residents in Bagmati to 88.8% among non-poor urban residents in Lumbini. Among those who faced challenge in accessing care, distance to health facilities was a barrier for 12.6% of the poorest and 65.6% of richest segment of population. In regression analysis, statistically significant association was noted with 92% lower odds for Karnali poor rural residents, 87% lower for Bagmati poor rural residents and 72% lower for Gandaki poor rural residents demonstrating stark inequities in access to care. **Conclusions and implications for policy:** Current practice of establishing health facilities solely based on administrative structures perpetuates inequitable access. Government should consider the other factors like area and population size of the administrative region, difficulties in geographical terrain, economic status of residents and access to means of transportation in establishing and expanding health infrastructures to ensure equitable access to and utilization of the health services.

Ind-818 The Impact of Long-term Prescription Policy on Primary Care Utilization and Costs among Hypertensive Patients in China: A Six-year Longitudinal Study

PRESENTER: **Chunlu Yu**
AUTHORS: Lei Zhang, Luying Zhang, Wen Chen

Background: To strengthen the chronic disease management, China has recently implemented the long-term prescription policy as a component of the family doctor system. This study evaluated the net policy impact on healthcare utilization and costs at community health centers (CHCs) among hypertensive patients. **Methods:** The study population included 164,857 hypertensive patients from a provincial capital city in Eastern China. Their healthcare utilization and costs from January 1, 2014 to December 31, 2019 were collected from the medical insurance claims database. Long-term prescription policy, implemented from 2018, allowing patients who registered with family doctors to obtain up to 3-month prescriptions. The multi-stage difference-in-differences model was applied to examine the policy impact, comparing healthcare utilization and costs between those eligible for the long-term prescription policy and those not. **Results:** The average age of the sample population was 69.93 years old, with 24.45% of the patients having hypertension-related comorbidities. By 2018, 155,258 patients had registered with a family doctor and were influenced by the long-term prescription policy, while additional 9599 patients were not influenced. The average annual number of outpatient visits at CHCs was 19.82 in 2017, with growth rate of 27.79% from 2014, while decreased to 16.10 in 2019. The interval of prescriptions at CHCs was 24.50 days in 2017, with decrease rate of 18.55% from 2014, whilst prolonged to 29.72 days in 2019. The average annual outpatient costs were USD 1,006.74 and USD 990.48 in 2017 and 2019, respectively. The average annual number of hospitalizations increased from 0.28 in 2017 to 0.45 in 2019. The long-term prescription policy significantly reduced hypertensive patients' annual outpatient visits by 2.47 at CHCs ($p<0.001$) and 0.18 at pharmacies ($p=0.018$), prolonged the interval of prescriptions by 3.10 days at CHCs ($p<0.001$). Furthermore, the policy decreased the annual drug costs at pharmacies by 47% ($p<0.001$), though it had no significant effect on the annual outpatient costs at CHCs ($p=0.240$). Additionally, this study didn't observe impact of the long-term prescription policy on patients' annual number of hospitalizations ($p=0.147$). **Conclusions:** The long-term prescription policy mainly affected patients' healthcare utilization at CHCs, and did facilitate patients with chronic diseases to refill drugs conveniently. The policy impact on patient health outcomes needs to be further observed and more attention should be given to the factors that may influence family doctors' behavior in delivering the long-term prescription service.

Ind-1642 Exploring Gender-Specific Unmet Needs and Affordability Barriers in Assistive Technology Access in Uganda: Insights From Uganda's 2023 rATA Survey

PRESENTER: **Md Zabir Hasan**, Johns Hopkins University
AUTHORS: Gerald Okello, Abdul Bachani, Wesley Pryor

Background: The global demand for assistive technology (AT) is increasing due to rising noncommunicable diseases and aging populations. However, access to AT in low- and middle-income countries remains limited, with financial barriers as the major drivers of inequities. In Uganda, where an estimated 7 million people need AT, gender differences in unmet needs and financial barriers remain poorly understood, deterring efforts to design equitable, gender-sensitive policies.

Objective: This study aimed to measure gender-specific unmet needs and financial barriers to accessing AT using data from the 2023 Uganda "rapid Assistive Technology Assessment (rATA)" survey.

Methods: This study included a representative sample of 16,733 individuals aged ⩾5 years from 3,188 households using multi-stage cluster random sampling, spanning 301 enumeration areas across 50 districts in 15 sub-regions of Uganda. Exploratory analyses were conducted to compare the proportions of unmet needs and financial barriers between genders. Multilevel mixed-effects logistic models were used to estimate gender-specific effects, accounting for clustering at the household and enumeration area levels. The adjusted models included covariates such as age, type and levels of functional limitations, and other demographic factors.

Results:

Only 4.5% (n = 758) of the respondents currently use AT products, while 21.0% (n = 3,515) reported unmet AT needs. Significant gender disparities were observed, with women accounting for 56.7% of those with unmet needs compared to men (43.3%, $p < 0.001$). Women with communication ($p = 0.002$) and memory-related ($p = 0.028$) functional limitations reported significantly higher needs than men. Financial affordability was the most frequently reported barrier, cited by 86.8% (n = 3,051) of respondents with unmet needs, with women disproportionately affected (57.7% vs. 42.4% for men, $p = 0.003$). Women with mobility ($p = 0.044$), hearing ($p = 0.007$), and memory-related ($p = 0.004$) limitations also reported significantly higher affordability challenges compared to men. In the unadjusted model, women had 1.22 times higher odds (95%CI: 1.12–1.32, $p < 0.001$) of reporting unmet needs than men. However, this association was no longer significant after adjusting for covariates (OR = 0.94, 95%CI: 0.82–1.09, $p = 0.431$). In contrast, women consistently had higher odds of reporting affordability barrier, both in the unadjusted (OR = 1.43, 95%CI: 1.12–1.83, $p = 0.005$) and adjusted models (OR = 1.36, 95%CI: 1.05–1.75, $p = 0.021$). Clustering effects were stronger in the affordability model than the unmet need model, with intraclass correlation coefficients of 18.4% vs. 12.3% at the enumeration area level and 48.6% vs. 41.2% at the household level, respectively.

Conclusions:

The findings reveal significant gender disparities in AT access in Uganda, with women facing higher unmet needs and financial barriers, particularly for mobility, hearing, and memory-related limitations. Policymakers must prioritize gender-sensitive strategies (e.g., subsidies, public financing, and insurance coverage) to address affordability concerns. Tailored programs for women with specific functional limitations, community-based distribution, and integration of AT services into broader health systems can reduce inequities. Incorporating these insights into Uganda's National Rehabilitation and Assistive Technology Strategic Plan will ensure equitable, inclusive access and improved quality of life.

abs-os15 Adolescent Mental Health Services in West Africa: A Comparative Analysis of Burkina Faso Ghana, and Niger.

PRESENTER: **Ludovic Deo Gracias Tapsoba**
AUTHORS: Ama Pokuaa Fenny, Michel Adurayi Amenah, Jacob Novignon, Roxane Borges Silva, Tim Ensor, Irene Agyepong, Ibrahlm Nasslrou

Background: Adolescent mental health (AMH) is a critical issue worldwide, particularly in West Africa, where it is intensified by socio-economic, cultural, and security challenges. Insecurity and the presence of mining sites expose adolescents to hazardous environments, substance abuse, and adulterated alcohol, further aggravating their mental health. Despite these severe issues, research on AMH in this region remains limited. This study aims to analyze the provision of AMH services in Burkina Faso, Ghana, and Niger, highlighting the unique challenges these countries face within the broader West African healthcare context.

Methods: The study adopted a multi-stage, stratified sampling design to collect data from primary healthcare centers (PHCs) in the three countries. Using STATA.17, Descriptive analysis was conducted on the data related to availability of AMH services, types of mental health disorders treated, resources available, and OPD attendance rates. The analysis also incorporated factors such as the rural-urban divide and the presence of national guidelines for AMH services.

Results: The findings reveal a significant shortfall in the provision of AMH services across the region, with less than 30% of PHCs across all the countries offering these services. The study also highlights a pronounced rural-urban disparity in AMH service availability, a general absence of national guidelines for AMH care, and low OPD attendance rates.

Conclusion: The study highlights the urgent need for comprehensive policy reform and targeted interventions to enhance AMH services in West Africa. Key policy reforms should include the development and implementation of national guidelines for AMH care and integration of

adolescent mental health services into primary healthcare. Additionally, efforts should focus on capacity building through the training of mental health professionals, increasing public awareness to reduce stigma, and ensuring equitable resource allocation across rural and urban areas. Improving AMH care is essential not only for the well-being of adolescents but also for driving broader socio-economic development in the region.

1:30 PM –3:00 PM WEDNESDAY [Health Beyond The Health System]

Bali International Convention Centre – Nusa Dua

Environment, Climate and Nutrition

MODERATOR: **Paula Lorgelly**,

Ind-6 Climate Vulnerability and Health Facility Performance in the Republic of Congo

PRESENTER: **Soazic Elise WANG Sonne**, The World Bank
AUTHORS: Tanmayn Vivek Kshirsagar, Sudhanshu Deshpande

Despite the fact that the Republic of Congo's (RoC) contribution to greenhouse gas (GHG) emissions is negligible, the country has recently faced a sharp increase in temperature and climate risks. Temperature projections, under the scenario of high emissions, indicate an increase in: (i) approximately 1.5°C by 2040 and (ii) 2°C to 3.5°C by 2070.Consequently, the Republic of Congo is ranked 106th out of 191 countries by the Inform Risk 2023 Risk Index, which measures exposure to climate risks. Climate change is likely to have serious consequences for human health. Climate change is already making the RoC hotter, with more erratic rainfall, and these changes are likely to accelerate in the coming decades, triggering more challenges for the health sector (Congo CCDR, 2023). The increased incidence of infectious diseases, such as malaria, cholera, typhoid fever, and tuberculosis, is a direct consequence of climate change in the RoC (GAVI,2022). Climate change-induced flooding due to heavy rainfall and heat stress exacerbates demand-side constraints by reducing access to health facilities and supply side constraints, damaging infrastructure and medical equipment and disrupting the availability of essential medicines and commodities. In this study, we provide a clear identification of where facilities, communities, and districts stand on the climate change vulnerability risk scale using unique geo-coded primary data from the latest 2023 general evaluation of health facilities in the country. Much specifically, we provide a map of which health facilities are facing the dual challenges of low health system performance due to lack of basic infrastructure and increasing vulnerability to climate change and environmental hazards. We also provide an empirical assessment of the relationship between extreme weather events and health facility performance using machine learning models and OLS modelling, controlling for human resources for health and financial resources. We found that climate change negatively impacts health facility performance after controlling human and financial resources.

Ind-2574 Exposure to Violence and Food and Mental Health Insecurity in the Occupied Palestinian Territories

PRESENTER: **Tracy Lin**

The detrimental effects of violent and non-violent political events on food insecurity, and separately, on mental health, are well documented in fragile and conflict-affected settings (FCAS). Concomitantly, the relationship between food insecurity and mental health is abundant. However, little is known about the differential and cumulative impact of repeated political events – ranging from violent events (e.g., military assaults) to less extreme non-violent events (e.g., international agreements) – on the relationship between food insecurity and mental health in FCAS. To address these gaps, we leverage a longitudinal, geo-location political events dataset (The Armed Conflict Location & Event Data (ACLED)) and three waves of repeated cross-sectional, representative household and individual survey datasets (Socio-Economic and Food Security Household Surveys (SefSec)) from a protracted conflict setting, the occupied Palestinian territories (oPt); together, these data are uniquely positioned to permit examination of the relationships between political events, food insecurity, mental health, and their intervening pathways. The time frame of this study is from 2016 to 2020.* We include three waves of bi-annual survey datasets (from 2016, 2018, and 2020) from oPt and geo-merged to an event-based, geo-location dataset of all violent and non-violent political events that occurred in oPt during the time frame. We tested whether increased frequency of political events (both violent and non-violent) will reduce food diversity (lower food consumption score), increase food insecurity (higher FIES), and increase level of distress (higher GHQ score).* Following previous approaches examining mental distress measured using GHQ-12, we begin the analysis with descriptive statistics and bivariate analysis, including t-test and ANOVA. To estimate the association between political events on food diversity, food insecurity, and mental distress in a multivariate analysis *(Aim 1a, 1b, 1c)*, we use a two-level random mixed-effects model that is expressed as follows: $Zitj = b0 + b1Pitj + b2Xitj + qj + mt + eit$ where *Zitj* is an indicator for a given outcome (i.e., food consumption score, food insecurity experience score, GHQ 12 score) for individual I at time *t* in district *j; Pitj* captures whether a political event type or the frequency of political event type occurred in the individual's district of residence; *Xi* represents a series of individual and household-level observable characteristics (e.g. economic status); θi represents a vector of district fixed effects; and μt controls for survey wave year. Preliminary findings suggest that increased frequency of political events (both violent and non-violent) reduced food diversity, increased food insecurity, and increased level of mental distress. The proportion of unacceptable food consumption scores increased from 0.8% in 2014 to 4% in 2020 ($p<0.05$) and the GHQ score increased from the mean of 9.06 (SD=5.01) in 2016 to 10.11 (SD=4.99) in 2018, underscoring a significant and worsening health condition in oPt, even before the most recent conflict escalation and resulting famine. Heterogeneous effects of exposure to political events are associated with residential military zones (Area A, B, or C) and economic status.

Ind-635 Dietary Diversity and Aspirations of Youth. Evidence from India

PRESENTER: **Deepthi Sara Anil**

1.Relevance of the study India faces persistent undernutrition and micronutrient deficiencies despite economic growth. Studies show no notable gender differences in stunting or anemia among children under five, though girls may be breastfed for shorter periods. Gender biases in food allocation for younger children are mixed; some studies show a pro-boy bias, especially among children of illiterate mothers, while others report no significant gender disparity in dietary intake at later ages. However, disparities become more evident in adulthood, as women aged 15–49 are less likely to consume nutrient-rich foods and face higher anaemia rates. Indian social norms, like women eating leftover food, can lead to internalized lower priority, affecting broader life aspirations (Ghatak et al., 2024). This study examines the link between dietary diversity and aspirations among children and adolescents in Andhra Pradesh and Telangana using data from the Young Lives project. Addressing nutritional disparities during this transition period is essential given India's significant gender gap in the labour force. **2. Data** Data come from the Young Lives project in Andhra Pradesh, focusing on two groups: the Younger Cohort (born 2001–02) and the Older Cohort (born 1994–95). A multi-stage sampling method targeted disadvantaged areas, selecting 20 clusters per country. Each cluster included 100 households with younger children (6-18 months) and 50 with older children (7-8 years). While not nationally representative, the sample aligns closely with India's population variability. Analysis spans survey Rounds 2, 3, and 4 (2006, 2009, and 2013). Dietary diversity data from these rounds measure the variety of food groups consumed over 24 hours, based on caregiver reports for younger children and self-reports for older ones. An index from 0 to 7 indicates the number of food groups consumed. Although dietary diversity was generally low, with about four groups on average, variation existed across food types like animal-source foods, fruits, and legumes. Aspirations are measured by expectations regarding education, employment, and belief in achieving these goals. **3. Empirical Strategy** To analyse the relationship dietary diversity and aspiration measures, we use the following model specification: $Yijt=\beta0+\beta1Diyt+\beta2Xijt+\delta j+\epsilon ijt$ In this model Yijt denotes the aspiration outcome for individual i in household j at time t, while ϵijt represents the individual-specific error term, which is unique to each person. The focus is on the parameter $\beta1$ which quantify the effects of dietary groups on aspirations. These parameters represent the average impact of consuming these foods on the outcomes. The model includes controls for age, gender, household size, BMI, marital status, education, employment, region, and income. Initially, Ordinary Least Squares (OLS) regression estimates dietary diversity's impact, with household-clustered standard errors. Additional estimates use household fixed effects to account for unobserved traits, though shared household factors may obscure dietary diversity's influence. The study also examines if effects vary by gender, age, religion, and BMI, with interaction terms identifying differences. Analyses of specific foods, like fruits, vegetables, and proteins, reveal which items most favourably impact aspirations.

Ind-2061 Examining the Relationships between Household Food Insecurity, Child Behaviour and Parent Mental Health Using Data from the Born in Bradford Study

PRESENTER: **Sarah Abraham**

AUTHORS: Penny Breeze, Hannah Lambie-Mumford, Laura Gray

Background Household food insecurity (HFI) refers to a situation where there is inadequate, unreliable access to adequate and nutritious food, at the household-level. The Department of Work and Pensions found that in 2023, 17% of children in the UK were living in food insecure households. Previous US-based studies have reported an association between HFI and poor child behaviour and mental health. These studies have identified the role of parent mental health as a mediator between HFI and child behaviour. No UK-based studies have explored this relationship, which is critical for evaluating the effectiveness and cost-effectiveness of interventions targeting HFI and its impacts on child health in UK child populations. Aim This study aims to examine whether HFI is associated with child behaviour in school-age children aged 7-11 years, and whether the relationship is mediated by parent mental health. Method We used datasets from the Born in Bradford (BiB) and BiB1000 sub-study at the Growing Up follow-up when children were aged 7-11 years. HFI was parent-reported using the six-item United States Department of Agriculture Household Food Security Survey module, between 2017-2020. Between 2017-2022, parents were invited to complete the Strengths and Difficulties Questionnaire (SDQ), a validated tool used to measure child emotional symptoms, conduct problems, hyperactivity, peer-problems and prosocial behaviour. A parent survey measured sociodemographic characteristics, self-reported symptoms of anxiety using the generalised anxiety disorder questionnaire (GAD-7) and depression using the Parent Health Questionnaire (PHQ-8). Complete cases were analysed. Confirmatory factor analyses (CFA) were estimated to test factor structures for child behaviour and parent mental health. A structural equation model (SEM) was estimated to test the direct and indirect pathways between HFI and child behaviour, and parent mental health. Child ethnicity, gender, household occupational status, parent age and free-school meal eligibility status were added as covariates for HFI and child behaviour pathways. While household size was a predictor of parent depression and anxiety. In secondary analysis, parent subjective financial insecurity was added as a covariate, to the HFI and parent mental health pathway. Results The total sample consisted of n=1763 and a large proportion of data were missing. Among complete cases (n=290), 90% children were food secure. CFA identified a three-factor model for child behaviour (internalising, externalising and prosocial), while parent mental health was represented by parent mental health latent factor, with subcomponents depression and anxiety. HFI did not have a statistically significant direct relationship with all three child behaviours. An indirect relationship between HFI and internalising ($\beta=0.12$, $p=<0.01$), externalising ($\beta=0.29$, $p<0.01$) and prosocial behaviour ($\beta=-0.10$, $p=0.03$), via parental mental health was observed. Conclusions This study found that HFI was not directly associated with child behavioural difficulties (internalising and externalising) or prosocial behaviours. However, findings suggest that HFI may adversely affect child behaviour through its impact on parent mental health. The study highlights the importance of considering parent-child dynamics when evaluating interventions aimed at tackling the health implications of HFI in children.

Ind-2237 Synergistic Effect of Nutrition-Specific and Nutrition-Sensitive Intervention to Combat Anemia: Evidence from an Indian Cohort Data

PRESENTER: **Disha Bajaj**

AUTHOR: Sukumar Vellakkal

Despite concerted efforts to combat anemia, it is the most common nutritional deficiency affecting over 72 million adolescents in India. In this regard, the Indian government has launched various interventions to overcome the prevalence of anemia among adolescents which are broadly categorized into access to health services and awareness programs. Wherein, Anemia Free India (2018), aims to improve compliance with Iron-Folic acid (IFA) supplementation and deworming; whereas, Adolescent Health and Wellness Day aims at disseminate useful information regarding health needs to school students, parents, and other key stakeholders. Interestingly, studies demonstrated mixed effectiveness of the

above-mentioned interventions due to ineffective coverage, consumption adherence, and frequency of IFA distribution. Past Research focused on the impact of specific and standalone health interventions on countering anemia, whereas synergistic effects of multiple national interventions were not entirely understood. **Objective:** In the study, we evaluate the impact of combined participation in nutrition-specific intervention (Weekly Iron-Folic Acid Supplementation -WIFS) and a nutrition sensitive intervention (Free from child marriage and dowry awareness program) on prevalence of anemia in adolescents aged 10-19 years. **Methods:** We exploited the comprehensive longitudinal data - Understanding the lives of young adults and adolescents (UDAYA) conducted in 2015 and 2018 with a total sample size of 16292 adolescents recruited from Bihar, India and Uttar Pradesh, India. In addressing the self-selection issues arising from voluntary nature of the program we employed the semi-parametric difference-in-difference and difference-in-difference with fixed effect, accounting for observed and unobserved heterogeneity to estimate average treatment effect. **Findings:** We found that simultaneous participation in programs increases the hemoglobin levels by 0.31 g/dl ($p<0.05$) and reduces the stunting by 9 percentage points ($p<0.05$) among the adolescents. We separately analyze the impact of individual interventions, WIFS was not able to improve Hb levels significantly ($p>0.10$), whereas free from child marriage and dowry awareness program increases the Hb levels by 0.25g/dl ($p<0.05$), which was lesser than the combined impact. In analysis of stunting, the impact of combined participation reduced the stunting of adolescent girls by 16 percentage points ($p<0.01$) and in boys stunting got reduced to 8 percentage points ($p<0.10$). In contrast, sub-group analysis found unchanged Hb levels among unmarried and married adolescent girls, whereas Hb levels were significantly increased by 0.35gm/dl ($p<0.05$) in adolescent boys. We conjecture that gender equality, education advancement etc., are few outcomes serves as the potential mechanism causing the discussed effect. **Discussions:** Our results suggest that to overcome the ineffectiveness of individual interventions it is required to establish the convergence for the better management of health and non-health related interventions. United Nations, 2018, explains that social policies can operate in holistic and integrated way when more focus is given to conceptualization and operationalization of interlinkages of sustainable development goals. Synergy of interventions has many other benefits, including cost-effectiveness, better reachability, targeting on larger group, and overall well-being of the society.

Ind-2341 The Effects of Food Security on Labor Productivity in Indonesia: Investigating the Mediating Effect of Stunting

PRESENTER: **Maman Saputra**
AUTHOR: Nicholas Goodwin

Abstract

Food security plays a crucial role in shaping human capital and labor productivity, particularly in developing countries like Indonesia. While prior studies highlight the impacts of malnutrition and food access on economic outcomes, limited evidence exists on the mediating role of stunting—a chronic form of malnutrition—in this relationship. This study addresses this gap by examining how food security dimensions influence labor productivity, mediated by stunting, using provincial-level data in Indonesia. The study employs panel data from the Central Bureau of Statistics and the National Labor Force Survey (2018–2023), analyzing relationships between food security dimensions, stunting prevalence, and labor productivity using a Fixed Effects regression model. The results show that a 1% increase in food access is associated with a 0.052 million IDR rise in labor productivity per worker ($p < 0.05$), while poor food utilization reduces productivity by 0.082 million IDR per worker ($p < 0.01$). Stunting significantly mediates this relationship, with a 1% rise in stunting prevalence linked to a 0.241 million IDR reduction in productivity per worker ($p < 0.05$). The Fixed Effects model explains 7.8% of productivity variation, indicating the importance of other factors such as education and healthcare. These findings highlight the economic costs of food insecurity and stunting, emphasizing the need for integrated nutrition and food security policies to enhance labor productivity. Addressing stunting through targeted nutrition interventions could yield substantial economic benefits by strengthening Indonesia's human capital.

Keywords: food security, labor productivity, stunting, human capital, economic valuation

Ind-2701 The Consumption of Sugar-Sweetened Beverages in Kenya and Its Association with Household Expenditure Allocation (Crowding-out Effect)

PRESENTER: **Mr. Senzo Mthembu**
AUTHOR: Hassan Haghparast-Bidgoli

There is a growing concern worldwide about the rising rates of overweight and obesity and their consequential healthcare and societal costs. In particular, Sugar-Sweetened Beverages (SSBs) have been linked to adverse health outcomes for individuals and communities, and their consumption can lead to significant costs at both the family and national levels. Moreover, if SSB expenditures displace expenditures on other essential goods and services, such as education and healthcare, this "crowding-out" effect could have long-term detrimental consequences. This ongoing paper aims to estimate the statistical association between spending on SSB products and budget allocation in Kenya. To achieve this, the paper draws on data from the Kenya Integrated Household and Budget Surveys (KIHBS) of 2015/2016, Demographic Health Surveys (DHS), and Euromonitor survey datasets. Furthermore, the paper uses a Generalized Ordered Probit model to estimate and examine the relationship between key socioeconomic variables and the decision to purchase SSBs. In addition, the paper utilizes a Seemingly Unrelated Regression Equations (SURE) methodology to investigate the association between the decision to buy SSBs and budget allocation on other goods and services. Specifically, we analyze the relationship between SSB expenditures and the allocation of budgets for other essential goods and services, such as education and healthcare. Our preliminary results reveal that households in Kenya allocate a substantial portion of their budget to SSBs, with a mean monthly expenditure of KES 100 ($0.76). We find that households with higher income and education levels are more likely to consume SSBs and allocate a more significant proportion of their budget to them. Finally, our analysis indicates that the "crowding-out" effect of SSB expenditures is present in Kenya, with a significant negative association between SSB expenditures and budget allocation on other essential goods and services. Our findings highlight the need for targeted policies and interventions to reduce SSB consumption in Kenya and promote healthier dietary choices, particularly among households with lower socio-economic status. Such interventions could include taxation policies, regulations on marketing and availability of SSBs, and educational campaigns on healthy dietary practices. Ultimately, addressing the issue of SSB consumption in Kenya could improve public health outcomes and reduce the burden of non-

communicable diseases while safeguarding the allocation of resources to other essential goods and services.

1:30 PM –3:00 PM WEDNESDAY [Health, Its Valuation, Distribution And Economic Consequences]

os163 Bali International Convention Centre – Bougainville

Moving Beyond the Health Focused Quality Adjusted Life Year: A Framework and Mixed Methods Empirical Examples

MODERATOR: **Rosalie Viney**, University of Technology Sydney

CONVENER: **Brendan Mulhern**, University of Technology Sydney

abs-os295 A Mixed-Methods Study to Determine the Validity of the EQ-HWB for Parents of Children with Health Conditions

PRESENTER: **Cate Bailey**, The University of Melbourne
AUTHORS: Kim Dalziel, Tessa Peasgood

Background: The EQ-HWB is a new, generic measure that aims to assess health, social care, and carer-related quality-of-life (QoL). There is emerging evidence on the EQ-HWB's performance for informal caregivers. Here, we present a mixed-methods study on the validity of the EQ-HWB (25-items) and EQ-HWB-S (9-items) in parents of children with health conditions, using qualitative and quantitative methods.

Aims: We aimed to investigate the psychometric properties of the EQ-HWB instruments compared to the Carer Qol-7D and EQ-5D and assess them in terms of the COSMIN attributes of relevance, comprehension and comprehensibility.

Methods: An online survey of parents with children with health conditions was developed that included demographic questions, informal care-related questions, and other QoL measures suitable for validation analyses (CarerQol-7D and EQ-5D-5D) as well as the EQ-HWB (25 items). The sample frame was participants from the Paediatric Multi-instrument Comparison Study who elected to be involved in further research. Analysis was conducted at the EQ-HWB (25 items) item, sum-score, and EQ-HWB-S (9 items) utility (pilot UK value-set) levels. We investigated response distribution by item, convergent and known-group validity with a priori expectations (Spearman's r, t-tests and one-way ANOVAs) and effect sizes (Cohen's d and eta-squared) compared to the other QoL measures. A short follow-up survey was administered 2-days later to investigate test-retest validity.

Twenty-one semi-structured, think-aloud interviews were conducted with a subset of parents. We used content analysis to investigate relevance and comprehension by item. Comprehensiveness was assessed by investigating participants thoughts on the choice of the 9 items for the EQ-HWB-S, and whether three caregiving concepts included in the CarerQol should be considered for inclusion in the EQ-HWB.

Key results: Data from baseline (n=230) and follow-up surveys (n=190) were obtained. The EQ-HWB item responses had a wide distribution over all items except the 5 physical items of seeing, hearing, mobility, activities, and self-care, where few problems were reported. Correlations were consistent with a priori hypotheses in convergent validity analyses. The EQ-HWB instruments performed well on a wide range of known groups specific to caregivers such as caregiver intensity, finances, ability to work while caregiving, as well as child factors such as child's mental health and QoL. Test-retest results were promising.

While most items were relevant for participants in this population, seeing and hearing were less relevant. Feeling unsafe was only found in a subset of participants, but these had high levels of problems. The items were well understood by participants, though some participants based their answers on whether they used the aids mentioned in the examples in the seeing, hearing and mobility questions. Participants found the items chosen for the EQ-HWB-S to be comprehensive. Participants preferred the fulfilment from caregiving and finance questions but were ambivalent about including a question about caregiver/care-recipient relationships.

Conclusions and implications: The EQ-HWB instruments performed consistently well in psychometric analyses and compared to other QoL instruments. The EQ-HWB instruments should be of high value in future health economic assessments with a need for an Australian value-set to facilitate scoring for our context.

abs-os293 A Theoretical and Methodological Framework for Extending the Health-Related Quality Adjusted Life Year by Combining Instruments

PRESENTER: **Rosalie Viney**, The University of Technology Sydney
AUTHORS: Brendan Mulhern, Deborah Street, Richard Norman, Rosalie Viney

Recently, there have been a number of calls in the literature to extend the focus of the quality adjusted life year (QALY) beyond a narrow focus on health-related quality of life (HRQoL), arguing that extending what is measured and valued will improve the allocation of scarce resources. A number of initiatives have developed broader instruments 'de novo', including the EQ-HWB, and psychosocial bolt-on dimensions for the EQ-5D-5L. Instruments have also been developed to measure broader areas of quality of life (QoL) such as social care using the Adult Social Care Outcomes Toolkit (ASCOT) and capabilities using the ICEpop CAPability measure for Adults (ICECAP). Much work has also focused on developing condition specific preference-based measures to complement generic instruments.

Another approach to extending the health focused QALY is to combine descriptive systems into a single instrument. This extends the measurement and valuation framework into a broader conceptualisation of QoL. The aim of this paper is to describe this approach, and outline the methodological process for generating broader descriptive systems. This will use the EQ-5D-5L and ASCOT as an example.

The presentation is divided into two sections. The first section explains the conceptual basis for combining existing instruments into a broader descriptive system, and discuss the advantages and disadvantages. Advantages include increasing measurement sensitivity to the wider QoL impacts of many interventions, and developing value sets encompassing preferences that are a result of trading off between diverse concepts of QoL. This enables values informed by impacts on broader QoL concepts with relevance across diverse health conditions, populations and interventions, to be used. Disadvantages include theoretical limitations linked to the constructs of generic or condition specific QoL the extended instrument could include, and practical difficulties in combining instruments into a combined system that is amenable to valuation.

The second section of the presentation describes the methodological process for generating combined descriptive systems. This includes a description of the process for identifying which constructs of QoL (or which instruments) should be included, and how different generic and condition specific constructs can be conceptualised in this approach. This is followed by an outline of both the qualitative and quantitative work required to generate a descriptive system that is psychometrically valid, and appropriate for valuation. Qualitative work includes cognitive interviews to assess the descriptive system, and possible framings of the dimensions as overall items and in a valuation task setting. Quantitative work includes conducting psychometric analysis to assess the relationship between the dimensions, and the dimension structure.

In conclusion, combining constructs of QoL from existing instruments offers a way to extend the QALY that differs to developing instruments de novo. This presentation will outline the framework for this approach, the advantages and disadvantages, and outline a research agenda.

abs-os297 Assessing the Dimensionality of Diverse Measures of Quality of Life using Factor Analysis

PRESENTER: **Mina Bahrampour**
AUTHORS: Akanksha Akanksha, Deborah Street, Rosalie Viney, Brendan Mulhern

Background: Various instruments have been developed to measure different aspects of quality of life (QoL). The EQ-5D-5L assesses health-related QoL, while the EQ Health and Wellbeing instrument (EQ-HWB) captures a broader concept of wellbeing that extends beyond health. The Quality of Life-Aged Care Consumers (QOL-ACC) focuses specifically on the QoL of older adults in aged care, and the Adult Social Care Outcomes Toolkit (ASCOT) assesses social care-related QoL. Although these instruments target distinct aspects of QoL, there is both overlap and divergence in the QoL constructs that are measured. Some evidence exists on the overlap and divergence between instruments, and this has been used to understand in which contexts instruments may be most appropriately used, and where instruments could be extended (e.g. with bolt-ons), or combined. However this work is dataset and measure specific and doesn't include newer instruments such as the EQ-HWB or QoL-ACC. This study aims to investigate the dimensionality of multiple QoL instruments (EQ-5D-5L, EQ-HWB, QoL-ACC and ASCOT) to reveal the primary domains and structures they measure, particularly in older populations. Understanding these differences will support the development of more comprehensive and integrated QoL assessments, inform where each instrument should be used, and guide further work exploring how to combine instruments in a broader measurement and valuation framework.

Method: Data were derived from a longitudinal online survey in Australia. Overall, 1505 respondents completed the survey, of which 453 participants were older than 65 and completed all four instruments. Exploratory Factor Analysis (EFA) was conducted to identify the underlying domain structure by pooling items from these instruments. Factors were selected based on eigenvalues greater than one, but a wider range of models including 3 – 8 factors were explored . A correlation cut-off of 0.32 was applied to determine item loading on a given factor. Both oblique (assuming correlations between factors) and orthogonal (assuming uncorrelated factors) models were explored.

Results: Comparisons of four, five, six, and seven factor models showed that the five-factor oblique model provided a better fit, model parsimony and interpretable with improved differentiation of items. The five factors identified represent key domains; emotional functioning; self care and usual activities; enjoyment of activities; cognition and senses; and pain. All factors incliuded items from at least three instrument Five items from the ASCOT and two items from HWB did not load on any factor

Conclusion: This study provides evidence on the dimensions of QoL assessed by health focused and broader instruments in an older adult population. The results inform the ongoing development of the EQ-HWB, and support the justification for, and conceptualisation and development of broader instruments.

abs-os300 Extending Quality of Life Measurement by Combining instruments: A Qualitative Exploration

PRESENTER: **Akanksha Akanksha**
AUTHORS: Carrie-Anne Ng, Richard Norman, Deborah Street, Mina Bahrampour, Katie Page, Brendan Mulhern, Rosalie Viney

BACKGROUND

Recent research has aimed to expand the scope of quality-adjusted life years (QALY) beyond a narrow health-related quality of life (HRQoL) focus to improve the equitable allocation of scarce resources. A novel approach to extend the health focused QALY is to combine existing descriptive systems into a single comprehensive instrument (for example combining HRQoL (measured by the EQ-5D-5L) with social care-related quality of life (SCRQoL) (measured by the Adult Social Care Outcomes Toolkit, ASCOT-SCT4). However, understanding how the distinct domains of these instruments overlap and diverge, and also how to frame and word the dimensions for respondent completion and valuation, is an important step in the development of a coherent combined tool. This qualitative study seeks to understand how respondents perceive the dimensions of each instrument, and the interactions between them, and also the preferred approach to wording and presenting the dimensions for valuation in a Discrete Choice Experiment (DCE).

METHODS

An adult Australian sample (n=15) was recruited to ensure a balanced age and gender distribution reflective of the general population. A think aloud interview with follow up prompts was used. To explore dimension perception and overlap, participants engaged in a 'card sorting' exercise, where they were shown all 14 dimensions from EQ-5D-5L and ASCOT and asked to group items they perceived as similar. For each grouping, participants provided a theme and rationale. To explore dimension wording and valuation format we tested modified versions of the ASCOT dimensions related to control, social contact, cleanliness, and dignity. Shortened descriptors and frequency-based response options were tested. Participants then completed four DCEs designed to evaluate the impact of presentation format and different wordings. Thematic analysis followed a deductive approach, utilizing an initial coding framework, with additional codes generated as new themes emerged.

RESULTS

Thematic analysis indicated that while respondents generally perceived the shortened ASCOT response options as similar to the originals, frequency-based options were often seen as distinct. Notably, for the control and dignity dimensions, the frequency-based wording sometimes influenced respondents' choice of response. Many respondents found frequency-based options easy to interpret, though a preference for the original ASCOT wording persisted among some. A three-column DCE layout (including overall dimension information as well as profile descriptors was widely favoured for its readability and ease of comparison, allowing respondents to better visualize their choices. Most respondents displayed consistency across the DCE tasks. The card sorting exercise revealed that participants often grouped items in ways that aligned with established EQ-5D-5L and ASCOT constructs, while some new themes emerged, such as 'assistance' and 'domestic violence,' pointing to unique interpretations of quality-of-life domains within an integrated measure.

CONCLUSION

Findings support the potential of a combined instrument combining EQ-5D-5L and ASCOT to measure and value broader QoL. The results provide further insight into conceptual overlaps, guiding the tool's refinement to better reflect integrated health and social care outcomes, and also inform the design of upcoming valuation studies to generate an Australian value set for the combined instrument for use in healthcare decision making.

1:30 PM –3:00 PM WEDNESDAY [Health Beyond The Health System]

os177 Bali International Convention Centre – Medan

Harmful Social Practices and Violence Against Women and Children: Intervention Effectiveness, Value for Money and Methodological Considerations

MODERATOR: **Giulia Ferrari**, London School of Economics & Political Science

abs-os400 (Digital) Cash Transfers and Intimate Partner Violence: Evidence from Uganda

PRESENTER: **Ms. Giulia Greco, PhD**, London school of hygiene and tropical medicine
AUTHORS: Pallavi Prabhakar, Selim Gulesci, Munshi Sulaiman

Abstract

Cash transfer programs are a key social safety net in many countries and one of the most used social protection measures in response to humanitarian crises.

More than 70% of countries in sub-Saharan Africa had some form of cash transfer programming. Cash transfers provide financial assistance to vulnerable households. However, evidence on the effects of cash transfers on women's empowerment and intimate partner violence (IPV) is mixed. Privacy of information is mentioned as a potential mechanism for why using digital financial services to transfer cash may lead to better outcomes for women, but evidence on this is suggestive at best.

We study whether mobile money has a differential impact compared to cash on women's economic outcomes and IPV. We present evidence from a cluster randomized controlled trial with over 2000 women from 250 communities in Uganda. Study participants were married women, aged 20-45 years, living with their spouses in refugee and host communities in Kyegegwa and Kiryandongo districts. They owned a mobile phone and had a mobile money account registered under their name.

Participants were randomly divided into four treatment arms and a control group. Two treatment groups received cash transfers, while the remaining two received mobile money transfers. Within each transfer modality, information about the cash transfers was either privately provided to the beneficiary, or shared with both the beneficiary and her spouse.

We find that the mode of cash transfers affect women's economic empowerment.

In particular, transfers paid in cash increase women's engagement in income-generating activities that they conduct jointly with their spouse. On the other hand, transfers paid into their mobile money accounts enable women to engage in their own, independent income generating activities. Women who receive mobile money transfers increase their independent, individual earnings by 31%. Women who receive mobile money experience a 0.17 SD increase in their control over labour market participation, children's schooling and health, household financial decision

and family planning. We do not find significant differences in terms of the privacy of information.

Transfers in cash are more effective in reducing IPV compared to digital payments, especially when women's partners are informed about the transfer. Women who received their transfers in cash and whose husbands were informed about the intervention were 12ppt less likely to report having experienced any type of IPV during the past year. This is driven by a decrease on all types of IPV, including an 8.4ppt for physical and 4.1ppt for sexual forms of IPV. None of the other treatment arms have a significant effect on IPV and we can reject null of equality between the effect of the joint cash treatment with all other arms.

These findings suggest that the public nature of cash transfers can be most effective in reducing IPV. Importantly, they demonstrate a trade-off between improving the effectiveness of cash transfers in terms of women's economic empowerment and reducing IPV: while digital payments can be more effective in empowering women, cash-based payments with public information can achieve greater impact in terms of IPV prevention.

abs-os467 Estimating the Prevalence of Child Labour in the Cocoa Industry Via Indirect Elicitation Methods: A Mixed-Methods Study

PRESENTER: **Aurelia Lepine**
AUTHORS: Henry Cust, Ariane Ndjore, Selina Binder, Megan Passey, Carole Treibich, Laurent Foubert

Abstract

Background

Child labour in Côte d'Ivoire's cocoa industry is a significant concern, with data from children indicating a prevalence of 38%. While child surveys may reduce sensitivity biases like social desirability bias, they pose ethical challenges and may still involve other reporting biases. This makes obtaining accurate estimates of child labour particularly challenging.

Research Aim

The study aimed to determine whether data collected from parents using indirect survey methods could provide more accurate estimates of child labour prevalence compared to direct questioning and child-reported data.

Method

Data were collected from 1,741 cocoa producers in Côte d'Ivoire. Researchers employed three approaches: direct questioning, a list experiment, and a novel non-verbal method known as the "colorbox." Qualitative in-depth interviews were also conducted to explore motivations behind reporting behaviours.

Results

Indirect elicitation methods revealed higher prevalence rates of child labour compared to direct questioning but yielded lower rates than child-reported surveys. Qualitative interviews highlighted parental underreporting due to fear of legal consequences and mistrust of stakeholders.

Conclusion

Indirect methods, while useful, are insufficient to fully address underreporting when collecting data from parents. To achieve more accurate estimates, future research should prioritize direct data collection from children while addressing the associated ethical concerns.

abs-os451 Social Norms Interventions to Prevent Child Marriage: Effectiveness and Cost-Effectiveness of CARE's Tipping Point Initiative in Pirgacha, Bangladesh

PRESENTER: **Ms. Giulia Ferrari**, London School of Economics and Political Science
AUTHORS: Shehrin Shaila Mahmood, Mahfuz Al-Mamun, Sultan Mahmud, Ruchira Tabassum Naved, Md. Golam Rabbani, Orin Akter

Background Child marriage (CM) is one of the main challenges to child development in Bangladesh, with 50% of girls being child brides. CM heightens health risks and lowers educational attainment and economic power. It remains a stubborn challenge rooted in harmful social practices. The Tipping Point Initiative (TPI) is social norms change intervention involving girls, parents and boys to eliminate CM developed by CARE. At 10 months post-intervention, TPI had no effect on child marriage. Social practices change slowly, yet evidence on the medium-term impact and cost-effectiveness of CM prevention through social norms change is lacking. *Aims* To report on the medium-term impact and cost-effectiveness of TPI by determining effectiveness and cost-effectiveness of - TPP+ versus the status quo - TPP versus the status quo - TPP+ versus TPP. *Methods* We report on the effectiveness and cost-effectiveness of TPP using primary data from a three-arm cluster-randomised control trial (cRCT) and accompanying costing study. A three-arm cRCT evaluated the impact of the intervention on girls' past-year CM: arm 1 received the Tipping Point Program, to empower girls (TPP); arm 2 received TPP and a social-norms change component (TPP+); arm 3 was a pure control arm (status quo). We determine effectiveness using linear multilevel models. We compute the economic costs of TPI from a provider perspective in USD 2022 prices, at 3% discount rate, in a research setting using bottom-up micro-costing. We compute the interventions' impact on girls' mental and sexual and reproductive health, and the incremental cost per Disability-Adjusted Life Year (DALY) averted by each programme compared to the other and to the status quo. Univariate sensitivity analyses show how uncertainty in cost

drivers impacts programmes' cost-effectiveness. A probabilistic sensitivity analysis computes the probability of cost-effectiveness for each comparison, given Bangladesh's budget constraints. *Key Results* Girls in TPP+ villages report a reduction in CM among at five years post baseline (adjusted risk difference: -0.01 (95% CI: -0.03, 0.24; NS). This result is not statistically significant. It cannot be generalised to the population. TPP has no impact on CM compared to the status quo and TPP+ reduces CM, in-sample, compared to TPP. We find similar patterns for girls' education and economic outcomes. TPP+ reduces depression compared to the status quo (adjusted risk difference: -.47 (95% CI: -.90, -.04; p<.05)) and averts .02 DALYs (95% CI: -.03, .002; p<.10). The incremental per capita cost of TPP+ versus control is USD 26, with a 12% probability of cost-effectiveness at Bangladesh's USD 186 willingness-to-pay threshold. *Conclusions* Girls' empowerment with community-wide social norms change (TPP+) improves girls' mental health and shows promise for the reduction of CM five years post baseline. The cost-effectiveness of TPP+ is promising. *Implications* Policy makers, donors and implementers should consider adding social norms change components to girls' empowerment programmes. Researchers should measure health impacts consistently and produce medium- to long-term impact estimates to assess the impact CM prevention.

1:30 PM –3:00 PM WEDNESDAY [Health, Its Valuation, Distribution And Economic Consequences]

os185 Bali International Convention Centre – Jakarta A

Integrating Equity into Decision-Making: Methods and Applications for Equity Informative Economic Evaluations

CONVENER: **Shan Jiang**, Macquarie University

DISCUSSANT: **Stéphane Verguet**, Harvard University

abs-os429 A Case Study of the Health Inequality Impact Calculator for Socioeconomic Groups in Australia

PRESENTER: **Anita Lal**, Deakin University
AUTHORS: Stephanie Moriarty, Gunjeet Kaur, Richard Cookson, Suzanne Robinson

Objectives

To evaluate the technical feasibility of routine distributional analyses of health care interventions in Australia, by developing a Health Inequality Impact Calculator for Queensland. Building on methodologies established in a previous study conducted in England, the calculator compares the magnitude of health inequality impact across interventions for different diseases.

Methods

The calculator was adapted for Queensland adults and Socio-Economic Indexes for Areas (SEIFA), an Australian measure of socioeconomic status. SEIFA specific data inputs included population estimates from the Australian Bureau of Statistics, hospital admissions by ICD-10 3-digit level in 2023 from Queensland Health, and quality-adjusted life expectancy. A targeted review was conducted to select a suitable cost-effectiveness study to demonstrate the calculator with i) a high health inequality gap, and ii) reported the health benefits in quality adjusted life years, and iii) reported incremental costs and benefits. The calculator determined the distributional cost-effectiveness analysis outputs, according to SEIFA quintiles and the health inequality benefit of the interventions based on the slope index of inequality in quality adjusted life years (QALYs).

Results

The case study chosen contained two interventions for screening of diabetes and hypertension, and three treatment interventions for the management of chronic kidney disease. The calculator demonstrated that all interventions would reduce health inequality. Population screening for diabetes had the greatest impact on reducing health inequality by 8,562 QALYs. Of the treatment interventions, intensive blood pressure control had the greatest impact on health inequality, with a benefit of 514 QALYS.

Conclusions

This study successfully adapted and demonstrated the feasibility of the health equity calculator for estimating the health inequality impacts of interventions in Queensland. The findings suggest that developing an Australian-wide version would be technically feasible for identifying when equity outcomes are relevant to policy decisions within the Australian healthcare system.

abs-os453 Equity-Informed Economic Evaluation of Next-Generation Nets for Malaria Prevention in Uganda: A Comprehensive Application of Multiple Equity Methods

PRESENTER: **Catherine Pitt**, London School of Hygeine and Tropical Medicine
AUTHORS: Katherine Snyman, Adrienne Eepstein, Sarah Staedke, Samuel Gonahasa

Background: Equity considerations are becoming increasingly important in economic evaluations, yet the best methods for incorporating equity remain uncertain. This case study explores the application of various equity-informative economic evaluation methods to assess the cost-effectiveness of screening for malaria prevention in Uganda, a low- and middle-income country (LMIC). Given that malaria disproportionately affects poor and rural populations, addressing the intersection of equity and efficiency is crucial in evaluating interventions that aim to reduce both the health and economic burdens of the disease.

Aims: This study assesses the cost-effectiveness and equity impacts of screening for malaria prevention within the context of the Uganda Housing Modification trial, a cluster-randomized study. The trial compares the impact of screening in two districts in Eastern Uganda.

Methods: We estimated the financial and economic costs of screening homes, from a disaggregated societal perspective. Intervention coverage and sociodemographic information was collected via cross-sectional community surveys. Cohort results in children 0-5 years was used to estimate the cumulative effects on malaria incidence over one year post-modification. A 3% discount rate and a five-year time horizon for costs and effects were applied, with malaria death effects modeled beyond this period. Incremental costs per malaria case and per DALY averted were calculated, and variations in cost, incidence, and cost-effectiveness across SES and house type were assessed. Uncertainty was examined using deterministic and probabilistic sensitivity analyses. Equity was assessed using multiple equity-informative economic evaluation methods including extended-cost effectiveness analysis, direct equity weighting and distributional cost-effectiveness analysis.

Results: Screening cost $8.13 per malaria case averted and $453 per DALY averted over five years, which is not cost-effective by any plausible threshold. Stratifying by wealth quintile, ICERs showed a clear trend as they were lowest in poorest quintile (Q1: $255/DALY averted) and highest in the least poor quintile ($1,535/DALY averted). There was no difference in financial risk protection across any of the quintiles. Using direct weighting with a social welfare function and the Uganda-specific inequality aversion parameter, the ICER decreased to <$1 /DALY averted. Distributional cost-effectiveness analyses will be completed in June.

Conclusion: Screening all homes in our study area was not cost-effective by conventional thresholds. However, cost-effectiveness improved substantially in the poorest households, highlighting the value of equity-informed approaches in economic evaluations. These analyses were only possible because the trial was designed to collect detailed sociodemographic and outcome data, underscoring the importance of planning for equity analysis in study design. We did not observe an equity-efficiency trade-off; rather, targeting poorer households appears to enhance both equity and efficiency. While the implementation pathway for housing modifications remains unclear—particularly regarding who bears the cost (households, government, or donors)—our findings suggest that targeted delivery could reduce health and economic disparities. This case study illustrates how incorporating equity into economic evaluation can generate policy-relevant insights for LMICs, especially for interventions like malaria prevention where disease burden is unequally distributed.

abs-os448 Evaluating Cost-Effectiveness and Distributional Impact of Population-wide BRCA Screening in Australia: A Model Incorporating Patient Preferences

PRESENTER: **Shan Jiang**
AUTHORS: Yuanyuan Gu, Bonny Parkinson

Background: Hereditary breast and ovarian cancer (HBOC), commonly associated with BRCA gene mutations, is a prevalent genetic disorder worldwide. In Australia, breast cancer is among the most common cancers, and ovarian cancer has a high mortality rate, highlighting the potential public health impact of effective screening. While cost-effectiveness analysis (CEA) is routinely used by Australian health authorities to inform policy decisions, the distributional impacts of interventions on health inequalities between socioeconomic groups remain underexplored, leaving a gap regarding the cost-effectiveness and equity implications of population-wide BRCA screening in Australia.

Aims: This study evaluates the cost-effectiveness of population-wide BRCA screening in Australia and its impact on health inequalities, aiming to inform policies that reduce disease burden and promote health equity.

Methods: A CEA was conducted comparing population-wide BRCA screening to family history-based testing among Australian women aged 30, 35, 40, 45, and 50. The analysis used a lifetime horizon from the Australian healthcare system perspective, with outcomes measured in quality-adjusted life years (QALYs) and 2024 AUD costs, discounted at 5%.

A decision-analytic model, comprising a decision tree and two Markov models, simulated screening outcomes. The first Markov model represented BRCA carriers undergoing annual mammography and MRI for intensive surveillance. The second model included carriers using mammography alone and non-carriers undergoing routine mammography. Transition probabilities included carriers opting for risk-reducing mastectomy or salpingo-oophorectomy if aware of their status. Model inputs were derived from Australian Bureau of Statistics (ABS) data and empirical studies.

Distributional impacts were assessed using net health benefits (NHB) and Equally Distributed Equivalent Health (EDEH) calculated with the Atkinson inequality index. Socioeconomic quintiles were defined using Socio-Economic Indexes for Areas (SEIFA). Opportunity costs were estimated using UK data as a proxy. The ICER threshold was set at AUD $50,000 per QALY.

Results: The ICER of BRCA screening varied by age. Screening at age 30 was cost-saving (ICER: AUD -8,331 per QALY). Screening at ages 35 and 40 was cost-effective, with ICERs of AUD 28,231 and AUD 40,086 per QALY, respectively, both below the threshold. Screening at ages 45 and 50 exceeded the threshold (ICERs: AUD 78,666 and AUD 155,937 per QALY). Distributional analysis showed that screening at age 30 increased both average QALE and EDEH, indicating overall health gains and a reduction in health inequality between socioeconomic groups. As the screening age increased to 35 and above, both QALE and EDEH decreased, suggesting diminished benefits and worsening health inequality.

Policy Implications: Population-wide BRCA screening is cost-effective for Australian women when initiated at younger ages, particularly at age 30, and contributes to reducing health inequalities between socioeconomic groups. Policymakers should consider implementing BRCA screening programs targeting younger women to achieve both economic efficiency and equity objectives. Early screening could lead to significant reductions in the disease burden and mortality associated with HBOC, while also addressing disparities in health outcomes across different socioeconomic strata. Strategies to enhance access and uptake among disadvantaged groups may further amplify these benefits, promoting a more equitable healthcare system.

abs-os458 Shall We Pay More for Rare Disease Drugs? Assessing Decision-Makers Preferences by A Sequential Discrete Choice Experiment Approach

PRESENTER: **Yuanyuan Gu**, Macquarie University
AUTHORS: Shunping Li, Shan Jiang, haiyin Wang

Background: Countries worldwide face the challenge of prioritizing the allocation of scarce health resources. Economic evaluation has become the preferred approach to inform policymaking, with the quality-adjusted life year (QALY) serving as the most widely used measure of healthcare treatment value. However, research and health technology assessment practices indicate that QALY gains alone may not fully reflect the value of interventions. For instance, QALY gains from treating rare diseases are often viewed as more valuable than those from treating common diseases. Nevertheless, empirical evidence on such value judgments remains limited, particularly from the perspective of decision-makers, and it remains unclear whether rarity itself generates additional value.

Aim: This study aims to investigate whether health insurance decision-makers in China assign higher value to rare disease treatments and, if so, to quantify this value.

Methods: We conducted two sequential discrete choice experiments (DCEs). The first DCE, labeled, compared a common disease drug with a rare disease drug and included five attributes: disease severity, childhood onset, potential for catastrophic expenditure, absence of alternative treatments (novelty), and clinical benefit. This experiment sought to identify the specific conditions under which decision-makers prioritize rare disease coverage. The second DCE, unlabeled, compared two rare disease scenarios within each choice task. It retained three attributes from the first DCE and introduced two quantitative attributes: average QALY gained per treatment beneficiary and the projected annual increment in social insurance premiums. These additions facilitated the estimation of willingness to pay per QALY, which was subsequently converted into incremental cost-effectiveness ratio (ICER) thresholds. A D-efficiency design was used, generating 16 and 20 choice sets for the first and second DCEs, respectively, each of which was blocked into two versions. In 2023, invitations were sent to all 120 decision-makers involved in the negotiation and development of the National Reimbursement Drug List. Data collection was conducted online through face-to-face interviews. Data analysis employed the conditional logit model, exploring various utility functions to capture decision-makers' preferences.

Results: In total, 101 eligible decision makers provided complete responses and were included in the analysis. Nearly half of the respondents were female (47.5%), with 58.4% having over ten years of professional experience. Many participants had expertise in health insurance system research (48.5%) and pharmacoeconomics (77.2%). Estimates from the first DCE suggest that decision-makers do not perceive rarity itself as adding value but place higher importance on disease severity, drug innovation, and health benefits, particularly the first two factors. The second DCE indicated that the ICER threshold for treating rare diseases, incorporating equity considerations, would be 1.9 times the GDP per capita—approximately three times the baseline ICER threshold currently used in China.

Policy Implications: Chinese decision-makers demonstrate a willingness to assign higher value to rare disease treatments, particularly when considering severity and novelty. This study provides empirical evidence that supports higher ICER thresholds for rare disease treatments to account for equity considerations. The findings offer valuable insights for policymakers seeking to refine health insurance reimbursement strategies and ensure a more equitable allocation of resources.

1:30 PM –3:00 PM WEDNESDAY [Health Care Financing & Expenditures]

os214 Bali International Convention Centre – Singaraja

Understanding Financial Hardship Through New Metrics and Innovative Data Collection Approaches

MODERATOR: **Gil Shapira**, world bank

CONVENER: **Gabriela Flores**, World Health Organization

DISCUSSANT: **Karen Grépin**, University of Hong Kong

abs-os581 High-Frequency Measurement of Health Out-of-Pocket Expenditure

PRESENTER: **Patrick Hoang-vu Eozenou**
AUTHORS: Mr. Gil Shapira, Asiyeh Abbasi

Designing more effective policies to improve financial protection in health requires a granular understanding of patterns of out-of-pocket (OOP) health spending. Typically, measures of financial protection are derived from infrequent, cross-section, nationally representative multitopic household expenditure surveys, collecting information on health OOP and on total consumption expenditure. To reduce recall bias, health expenditure modules usually collect data on expenditure on outpatient care and medicines during a short period preceding the survey interview (e.g. 4 weeks). The implicit annualization assumption used to construct household budget shares for health expenditure may often be wrong, particularly in contexts where seasonal variations in health expenditure are prevalent or where health spending is driven by large infrequent spending events. In this study, we analyze panel data collected at infra-annual frequency through phone surveys in 5 sub-Saharan African countries between February 2022 and April 2024 to assess how the use of more frequent data would change inference on who is spending and how much they spend. To do this, we compare the annualized distribution of OOP per capita and its composition across 3 different annualization estimation approaches: (1) panel data approach, (2) pooled cross-sectional estimation, and (3) single independent cross-sectional estimation. We treat the panel data approach as our benchmark and report the average difference with the other two estimation methods to

distinguish between the role of high-frequency data collection from the role of collecting longitudinal information at household level.

abs-os566 Towards Universal Health Coverage: A Unified Tracking of Financial Hardship in 153 Economies

PRESENTER: **Gabriela Flores**, World Health Organization
AUTHORS: Asiyeh Abbasi, Marc-Francois Smitz, Paatrick-Hoang-vu Eozenou, Mr. Gil Shapira, Catherine Korachais, Vladimir Sergeevich Gordeev

Background Financial hardship is a key consequence of inadequate financial risk protection mechanisms, hindering progress toward Universal Health Coverage (UHC). The Sustainable Development Indicator 3.8.2 is intended to track financial hardship due to out-of-pocket (OOP) health spending. This is currently done with a focus on large household expenditure on health as a proportion of total household expenditure or income. After six years of tracking SDG 3.8.2, the evidence emerging from global, regional and country data is clear. The current definition doesn't capture much of the financial hardship experienced by poorer people and lower-income countries. Of the latest estimated 1 billion people with household expenditures on health exceeding 10% of household total expenditure or income for 2019, only 9% were living in extreme poverty and only 13% were living in relative poverty. Within countries, health expenditures exceeding more than 10% of household budget are mostly concentrated among the better off. This paper proposes a globally policy relevant indicator that classifies both large and impoverishing OOP health spending as financial hardship while recognizing that the cost of basic needs increase as countries become richer. **Method** Drawing on previous methodological work to develop metrics based on household's discretionary budget, also called capacity-to-pay approaches, and the social poverty line, this paper proposes to identify the proportion of the population with positive out-of-pocket household expenditure on health exceeding 40% of household discretionary budget to monitor financial hardship. The overall population rate can be decomposed into those facing only large OOP health spending or both large and impoverishing OOP health spending. We produced population rates for 153 economies accounting for 95% of the world's population in 2019, using data from 808 surveys. **Results** The concentration index of the proposed definition points to a greater financial hardship experienced by the worse-off in 97% of the economies; the median gradient across quintiles of both consumption and income is systematically negative; trends over time within countries are not sensitive to the choice of the threshold value (10%, 25%, 40% or 100% of the discretionary budget); using the 40% threshold, median rates in low-income countries are 2.7 times higher than in high-income ones. In all countries, the level of financial hardship is higher than the rate of both, those incurring catastrophic OOP health spending as tracked by SDG 3.8.2 indicator and impoverishing OOP health spending, but it is lower than their simple sum. The global trend of the proposed indicator points to a reduction financial hardship driven by a reduction in the population rate experiencing impoverishing OOP health spending. But in terms of number of people facing financial hardship, the reduction is marginal (2.02 billion in 2019 versus 2.04 billion in 2000). **Conclusions** The proposed definition is globally applicable and policy relevant and provides a robust assessment of financial hardship over time, within and between countries. The proposed definition aligns better with the Sustainable Development Goals objective to leave no one behind and reduce inequalities.

abs-os582 Validating Out-of-Pocket Health Spending Data Collection: Computer-Assisted Mobile Phone Survey Vs. Face-to-Face Survey

PRESENTER: **Idrissa Ouili**
AUTHORS: Abdramane Soura, Souleymane Sanogo, Gabriela Flores

Background Household surveys are the main data source for estimating financial hardship due to household out-of-pocket payments (OOPs) and the primary source of information in national health accounts, especially in developing countries. However, these surveys are expensive to conduct every year, resulting in irregular data. The use of mobile phones as a means of data collection can reduce costs and time. To date, the validity of mobile phone-based data for assessing OOPs has not been sufficiently investigated. This field experimental study conducted in Burkina Faso aimed to investigate the agreement between provider records and household reported OOPs via a computer assisted face-to-face survey (CAPI) and a computer assisted mobile phone (CATI) survey. **Method** We used provider sampling approaches with prospective data collection for outpatient and drug item validation and retrospective data collection for inpatient item validation. Households were randomly assigned to the two data collection methods (CAPI versus CATI) within two sampling groups. The sample sizes are 140 (CAPI) and 124 (CATI) for the prospective data collection and 113 (CAPI) and 131 (CATI) for the retrospective data collection. Using data from provider records as the gold standard, we compared the mean OOPs and estimated the mean ratio and variability in the ratio of household expenditures to provider data using the Bland-Altman method of assessing agreement. **Results** Overall, for both data collection methods (CATI and CAPI), household OOPs tend to be higher for outpatient and inpatient services than for the corresponding provider OOPs, and lower for medicines. The ratio of means outpatient OOPs (households/providers) is 58.65 for CATI compared to 19.31 for CAPI, and the ratio for inpatient OOPs is 5.26 for CATI versus 4.88 for CAPI. These values are 0.39 for CATI versus 1.01 for CAPI for OOPs on medicines. The mean bias is higher for mobile phone surveys than for face-to-face surveys for outpatient OOPs (CATI=23.16 versus CAPI=2.70) and medicines (CATI=0.26 versus CAPI=0.56), but lower for inpatient OOPs (CATI=2.00 versus CAPI=4.17). The variability, measured by the 95% limits of agreement, also varied by type of spending and was especially wide for outpatient OOPs. We find evidence of an effect of the data collection method on outpatient OOPs. The average health expenditure derived from CATI increases by 2.14 times (p=0,000) as the average health expenditure derived from CAPI increases. There was no evidence of a differential effect between the two methods in estimating OOPs for inpatient care and medicines. **Conclusions** The study suggested that CATI is as reliable than CAPI to collect data on OOPs for inpatient care and medicines at the household level.

abs-os632 Validation of Self-Reported Information on Financial Hardship

PRESENTER: **Rocio Garcia-Diaz**
AUTHORS: Gabriela Flores, Vladimir Sergeevich Gordeev, Rouselle Flores Lavado

Background People suffer financial hardship when their out-of-pocket (OOP) health spending threatens their living standards or compromises access to essential goods such as food, shelter, clothing, or education. Traditional measures of catastrophic and impoverishing OOP health

spending capture this concern by comparing household's out-of-pocket health spending to their total consumption expenditure or income. However, this requires collecting data on a battery of questions through lengthy, resource-intensive, and detailed face-to-face household surveys, limiting the availability of timely data at global, regional, and country levels, especially in low-resource settings. Failure to produce recent and frequent information limits the evidence base of policy recommendations and the possibility of evaluating recent policy efforts. This paper examines the reliability of a simplified, self-reported measure of financial hardship, where respondents are asked whether anyone in the household had to reduce spending on necessities (such as food, housing, or utilities) because of OOP health spending. Such self-reported information was piloted in Facebook and mobile phone surveys in 2021 and 2022. However, this is the first time that a self-reported financial hardship question was collected alongside a comprehensive consumption module, which would allow for its validation. **Methods** Using data from Cambodia, we assess the reliability of this self-reported measure compared to traditional, quantitatively derived indicators of financial hardship. First, we evaluate the agreement between the self-reported and quantitatively derived indicators using Bland-Altman analysis. Second, we assess the predictive validity of both measures in identifying reductions in consumption of necessities through fractional logit regression. Third, we explore the association between both measures and self-reported anxiety about future household finances due to healthcare costs, serving as an indirect indicator of economic stress. To understand the drivers of discrepancies, we examine how household characteristics – sex and age of the household head, age composition, household size, and income quintile – affect the variation in financial hardship reports and identify which subgroups show the greatest differences between self-reported and quantitative measures. **Preliminary Results** Preliminary analysis shows that self-reported financial hardship is higher than quantitatively derived indicators. However, we expect the two measures to exhibit reasonable agreement overall. We anticipate that discrepancies will vary systematically by household type, with larger and lower-income households – who may experience greater financial strain – more likely to report financial hardship, while smaller and higher-income households may underreport due to the framing of the question. Preliminary analysis suggests that self-reported measures of financial hardship can identify people dedicating on average a smaller share of their budget to food. We further expect that both measures of financial hardship will correlate strongly with anxiety about future household finances, reinforcing their validity as indicators of financial stress. **Conclusions** If the self-reported measure aligns reasonably well with the more detailed quantitative indicator, it could provide a practical, though less precise, alternative for monitoring financial hardship with in low-resource settings, in shorter but more frequent surveys or full-scale surveys that cannot accommodate a lengthy questionnaire on consumption.

1:30 PM –3:00 PM WEDNESDAY [Economic Evaluation Of Health And Related Care Interventions]

os33 Bali International Convention Centre – Denpasar B

Costing the Community-Led Response: Methods, Evidence and Lessons Learned

MODERATOR: **Fern Terris-Prestholt**, UNAIDS

CONVENER: **Kathleen Victoire McGee**, London School of Hygiene and Tropical Medicine (LSHTM)

DISCUSSANT: **Lorna Guinness**, London School of Hygiene and Tropical Medicine (LSHTM)

abs-os435 Valuing Volunteer Time in Community-Led Interventions: Insights from Cost Analyses of Student- and FSW-Led Programs in Zimbabwe

PRESENTER: **Collin Mangenah**

AUTHORS: Ms. Fern Terris-Prestholt, Oppah Kuguyo, Primrose Matambanadzo, Jane Kalweo, Karin Hatzold, Liz Corbett, Lindiwe Mancitshana, Frances M Cowan, Euphemia L Sibanda

Background Excluding volunteer time in cost estimates can lead to underfunding and unsustainable programming, while overestimating its value can tie up limited community resources. We evaluate alternative methods of valuing volunteer time in three Zimbabwe community-led interventions: FSW-led self-help groups (SHG), student-led HIV self-testing, and student-led distribution of a self-care packages for pregnancy and HIV. **Methods** Three interventions were implemented between October 2022 and February 2024. In the FSW-led SHG intervention, 10 groups nominated representatives to an empowerment resource group for training as peer trainers and crisis responders, integrating income-generating activities to make members both users and providers. The tertiary student-led interventions supported peer-led distribution of HIVST kits and self-care products (HIVST, post-exposure prophylaxis, emergency contraception, and condoms) to their peers. We analysed total and unit financial and economic costs, using expenditure records, on-site observations, and detailed self-reported time logs. Volunteer time was valued using financial cost ($50/month) and their opportunity costs (minimum hourly wage of $1.03 for FSW and student intern rate of $1.21). Costs were adjusted to 2024 USD. **Results** Across 10 SHGs, 70 members were supported at a financial cost of $229 ($220-$258) per member when volunteer time was valued at $50 monthly reimbursement. Economic costs, including volunteer time contributions (mean: 14 hours; range:<1 to 48 hours per member) valued at $14.59 (cross SHG group range: <$1-$49.61), resulted in $307 ($253-$415) per member. For HIVST distribution, the economic cost per student exposed to the programme was higher ($1.85) in peer-led distribution than in control ($0.91). Average financial cost per HIVST kit distributed was US$8.28 (cross institution range: $4.65-$17.47) and US$10.23 (cross institution range: $8.13 - $24.61) across the two arms. Economic cost per HIVST kit distributed (including valuation of distributor-time based on the average of the peer self-recorded distribution time, the mean medical staff ($2.50) and Zimbabwe student internship rates ($1.25) were US$8.45 and US$10.40 per HIVST kit distributed respectively. For the self-care intervention, the financial cost per student reached was $7.72 (cross institution range: $4.84-$13.39) when valuing distributor-time at the $50 incentive rate, and $7.75 (cross institution range: $4.85-$13.44) when valued on the average of the peer self-recorded distribution time and the mean Zimbabwe student internship rate ($1.25 per hour). **Conclusion** The results of the three studies show wide variation in the self-reported number of hours worked and in unit costs (financial versus economic), underscoring challenges in designing fair pay systems and valuing donated time equitably. These findings highlight the importance of balancing equity and real-world cost considerations in community-led interventions to ensure sustainable programming and fair compensation.

abs-os408 Costing the Breadth of Community-Led HIV Services: a Participatory Study in Sierra Leone

PRESENTER: **Kathleen Victoire McGee**
AUTHORS: Wilbourne Showers, Consortium of Community-led Representatives, Emmanuel Koroma, Abdul Rahman Sessay, Amara Lebbie, Isaac Ahemesah, Ms. Fern Terris-Prestholt

Background Community-led organizations (CLOs), led by and for key populations, are pivotal in delivering HIV services to their communities. Health services are rarely delivered in silos but are integrated into larger packages of care tailored to community needs. However, the economic costs of these activities remain poorly understood, limiting efforts to scale and sustain them. This study assessed the financial and economic value of resources used by five CLOs delivering HIV services from June 2022 to June 2023. **Methods** The five CLOs provided integrated services including HIV testing, care linkage, ART adherence support, socio-economic assistance, and support for gender-based violence and stigma reduction. Services were delivered to people and children living with HIV, female sex workers, and men who have sex with men. Financial costs were derived from expenditures, while economic costs included communities' donated goods and volunteer time. Financial data were supplemented by interviews, field observations, and timesheets documenting resource allocation per intervention. Costs were adjusted to 2024 US Dollars ($). A participatory approach was employed, involving collaboration between CLOs and health economists. **Results** CLOs delivered complex health and social interventions that often overlapped. Costed interventions and units of outcomes were defined by the CLOs based on available output and outcome data, prioritizing unit costs that were relevant and actionable for their programming. Annual costs across the five CLOs ranged from $103,038 to $432,674. Prevention-focused CLOs allocated 30%-44% of costs to sensitization and HIV testing, and 14%-23% to community engagement and stigma reduction. ART adherence-focused CLOs directed 26%-30% of costs to adherence support, with 42%-69% supported broader services like community engagement and socio-economic assistance. During the study period, the CLOs tested between 149 and 27,222 individuals, yielding positivity rates from 1.63% to 14.77%. Financial costs per person tested ranged from $4.14 to $25.70, and per positive case from $76.59 to $521.30. Economic costs per person tested were $4.56 to $26.64, and per positive case $84.32 to $525.36. ART adherence support costs ranged from f $9.75 to $15.41 per client (financial) and $15.64 to $20.65 (economic). Non-health services included skills training and livelihood support ($14.53-$33.20 financial; $21.20-$33.49 economic per person), educational support ($10.67 financial; $11.83 economic per person), gender-based violence support ($17.40–$36.39 per case), stigma reduction activities ($66.69 per activity), and community engagement events ($791.07–$1,335.63 financial; $939.59–$1,518.60 economic per event). **Conclusion** CLOs deliver a holistic package of care, integrating HIV and non-health services to address community needs comprehensively. Volunteer contributions and non-health services enhance outreach and reduce unit costs for HIV testing and adherence support, but failure to account for the full spectrum of activities risks underfunding CLOs and their communities. The participatory approach was instrumental in breaking down complex, overlapping interventions into defined and actionable unit costs, ensuring findings are relevant to CLOs. Comprehensive costing of these integrated services is essential for effective resource allocation and policy planning to strengthen community-led HIV responses.

abs-os200 Guideline for Costing and Budgeting the Community-led Response

PRESENTER: **Pitchaya Peach Indravudh**
AUTHORS: Kathleen Victoire McGee, Sedona Sweeney, Charity Nagemi, Mitzy Gafos, Ms. Fern Terris-Prestholt

Introduction Global HIV targets aim to expand the role of community-led organisations (CLO) in delivering interventions for testing, treatment, prevention, and addressing societal enablers. Complete cost estimation of the community-led response (CLR) is important to guide planning, investment, and resource mobilisation. While standardised guidelines and tools for costing and budgeting health interventions exist, they lack sufficient focus on issues specific to CLRs, including measuring and valuing donated time and resources. Without such methodological guidance, there is a risk of underestimating costs. Additionally, most guidelines are designed for technical audiences, underscoring the need for tools CLOs can use to estimate their own costs and project future costs. **Methods** We conducted literature reviews and expert consultations to inform the development of the costing and budgeting guideline for CLRs. Literature reviews included 15 guidelines addressing costing and budgeting across health areas, assessing principles, methodologies, and reporting standards. Quality of guidelines was evaluated using an adapted framework based on standard costing principles. Expert consultations convened a technical advisory group of 15 experts, including CLO members, to build consensus on the proposed guidance, with monthly meetings over 12 months. Topics focused on defining CLO needs in producing and using costs and understanding contexts for cost estimation. **Results** We developed guidance on costing and budgeting of CLRs with CLOs as the primary audience. The first section establishes a conceptual and methodological foundation for CLOs. Chapter 1 introduces the guideline, while Chapter 2 defines CLRs, describes core response areas, and identifies key resources contributing to costs. Chapter 3 provides guidance on defining the purpose and scope of the exercise. Key concepts covered include the purpose of cost estimation for CLOs, including to support advocacy and resource mobilisation; perspectives, including CLOs as both providers and users; time horizons relevant for CLRs; types of costs, particularly economic costs of donated time and resources; and types of inputs and outputs, including those related to non-service delivery interventions (e.g., advocacy). Chapter 4 summarises methods and data sources for costing and budgeting, highlighting approaches for measuring and valuing in-kind contributions. The second section applies these concepts and methods and includes tools to aid CLOs in data collection and analysis. Chapters 5 and 6 offer guidance for planning, collecting, and analysing observed costs, while also addressing constraints experienced in costing CLRs. Chapter 7 includes instruction for planning and projecting costs based on observed and modelled costs. Throughout the guideline, case studies, worked examples, and presentation slides are included to facilitate learning. **Conclusion** This guideline provides a comprehensive framework for costing and budgeting CLRs and addresses an important gap in practice for CLOs. By addressing key issues relevant to CLRs, this guideline can enable more complete estimations of observed and projected costs. Applications of this guideline will enhance the quality of cost data and therefore their usefulness for informing decision-making for programme and policy in the context of the CLR. Piloting is underway to further refine the relevance of the guideline based on their practical applications.

os50 Bali International Convention Centre – Orchid

Trust, Governance, and Public Programs: Health Systems Research in China

MODERATOR: **Zhuo Chen**, University of Georgia

DISCUSSANT: **Wei Jiang**, University of Nottingham Ningbo China

abs-os590 Government Subsidy, Hospital Expansion, and Patient Expenditures: Evidence from Public Hospitals in East China

PRESENTER: **Mr. Wei Jiang**
AUTHORS: Lina Song, Qiulin Chen, Xuyan Lou, Mr. Zhuo Chen

The growing health expenditures raised great concerns worldwide, and China is no exception. Most existing studies focused on specific policies related to medical price regulation and hospital expansion. However, we have limited knowledge of how government subsidy affects hospital management and performance. Our research provides new evidence on the causal relationship between government resource allocation and hospital management. Using a unique administrative dataset with hospital-level information, we conducted a series of empirical analyses to explore how government subsidies were determined for public hospitals and the impact of subsidy on patients' medical expenses. To remediate the biases associated with omitted variables and unobservable individual heterogeneity, we use a dynamic panel regression model to estimate the impact of government subsidy on patients' medical expenditures. The benchmark results present a positive effect of subsidies on drug expenditures and medical service expenditures. In contrast, inpatient services are less affected by subsidies. In addition, this study conducts non-linear regression model to investigate how subsidy influences patients' expenditures under different scenarios of hospital management strategies. For hospitals in the stage of expansion, government subsidies are positively associated with patients' expenditures. We conclude that government subsidies do affect hospital-level outcomes but more research is needed to determine if the subsidies achieve the policy objective and are cost-effective. Keywords: Government subsidy, Hospital management, China, Dynamic panel regression

abs-os583 Public Trust in Physicians and the Role of Healthcare Utilization: Evidence from China

PRESENTER: **Yang Li**
AUTHORS: Lefan Liu, Mr. Zhuo Chen

A growing body of literature realizes the importance of public trust in physicians in shaping the patient-physician relationship in the healthcare system of most countries, particularly in China. Using China Family Panel Studies (CFPS), a nationally representative data, this paper examines the effects of healthcare utilization on patients' trust in physicians in China. We measure respondents' healthcare utilization from three dimensions: any use of health- care services, medical cost, and primary health care utilization. Our analyses suggest that consumption of healthcare services in the past year, either inpatient or outpatient care, is significantly associated with an increase in one's trust in physicians, indicating the effect of dynamic learning from past health utilization experience. However, the share of out-of-pocket expenditure has a significantly negative impact on one's trust in physicians. The choice of health providers also matters: using primary facilities has a negative impact on respondents' trust in physicians compared with those who seek healthcare from higher-tier hospitals. Our heterogeneous analyses further show that this negative effect of using primary facilities tends to be statistically significant among urban residents and the older group, which can be explained by patients' perceptions and ratings of health providers. We provide two policy implications. First, the current healthcare reform, aiming to reduce the financial burden of residents in using healthcare, including more generous insurance coverage and less incentive for physicians to over-prescribe, is likely to improve public trust in physicians. Second, efforts should be made to strengthen the quality of primary health care facilities, which can help to enhance patients' trust in physicians and thus to incentivize patients to use primary health care.

abs-os600 Reflections and Insights on the Modernization of Chinese Health Governance

PRESENTER: **Ms. Cheng Xu**
AUTHOR: Yao Xiong

Health governance is a critical issue that requires attention worldwide, and it is also a significant measure to promote the implementation of the Healthy China strategy. This study, based on the concept of systems thinking and governance framework, analyzes literature and conducts expert interviews to summarize the characteristics of health governance systems in different dynasties and identify the core elements that influence the development and evolution of health governance systems in China. The research found that the health governance system in China originated in the Western Zhou Dynasty and continued to evolve during the Qin and Han dynasties. During the Sui and Tang dynasties, the medical education system underwent significant development. In the Song Dynasty, a health governance system led by the government with the support of social forces began to take shape. In the Yuan Dynasty, under the exchange and integration of multi-ethnic medical cultures, a top-down, network-radiating governance system was formed. In the Ming Dynasty, not only did the development of formula science accelerate, but a relatively complete medical security system was also established. In the Qing Dynasty, the public health system was further improved. In addition to the changes in political structure, economic development level, and external system environment such as epidemics and wars, which played an important role in the evolution of the health governance system, people's perception of health and its determinants, especially the perception and preferences of successive rulers, as well as the development of medical concepts and diagnostic and treatment technologies, also had a decisive influence on the objective functions, organizational structures, and governance tools of the health governance system. This study provides a new perspective for understanding the health governance systems of different dynasties in ancient China, which can help further

explore the theoretical framework of health governance systems and mechanisms. It also provides valuable references for exploring the modernization of Chinese-style health governance and global health governance practices. Keywords: Health governance, Medical Security and Policy Development, Chinese-style, Historical reflection, Global health governance

abs-os587 Road to an Age-Friendly Society: A Performance Evaluation Framework for Healthy City Strategies in China

PRESENTER: **Yao Xiong**
AUTHORS: Yuexia Gao, Ms. Cheng Xu

With the acceleration of global population aging, developing age-friendly societies has become in high demand as a response to demographic aging. This study explores how healthy cities influence the development of age-friendly societies and the key challenges and opportunities. The construction of the assessment framework begins with an analysis of the definition and core dimensions of an age-friendly society, integrating guidelines from the World Health Organization (WHO) and other sources. Existing evaluation methods and indicator systems are identified and integrated. A multi-dimensional assessment framework is constructed, including social security, health and elderly care services, livable environments, and social participation, with 12 secondary and 28 tertiary assessment indicators defined. Data collection involves the development of questionnaires and interview guides, designed to capture the nuances of age-friendly society constructs. The selection of cities and communities is based on a stratified random sampling method, ensuring representation from various geographical, socioeconomic, and demographic profiles. The survey includes a mixed-methods approach, combining quantitative data with qualitative analyses. Surveys are administered to a random sample of older adults and community leaders, while interviews are conducted with key informants, such as healthcare providers, urban planners, and social service coordinators. Statistical methods are applied to the collected data to validate the assessment indicators and the reliability of the assessment model. Factor analysis is used to identify underlying patterns and groupings within the data, which helps in refining the dimensionality of the assessment framework. Reliability analysis, specifically Cronbach's alpha, is employed to ensure the internal consistency and stability of the survey instruments. Data Envelopment Analysis (DEA) is utilized to evaluate the relative efficiency of different age-friendly initiatives across the selected cities and communities, providing insights into best practices and areas for improvement. Multiple regression analysis is conducted to explore the relationships between the various dimensions of the assessment framework and key outcomes, such as health outcomes and quality of life indicators. Factor analysis confirmed the validity of the assessment indicators, while reliability analysis showed that our questionnaires and assessment tools have a high degree of internal consistency. Data Envelopment Analysis (DEA) revealed efficiency differences in the construction of age-friendly societies across different cities and communities, identifying best practice cases and areas for improvement. Multiple regression analysis found that the accessibility and quality of health services, the adaptation of housing for older adults, and the participation in community activities are key factors affecting the quality of life of older adults. The study also pointed out that insufficient funding, uneven policy implementation, and low community participation are the main challenges faced in the construction of age-friendly societies, while technological progress, increased social awareness, and policy innovation provide opportunities. Therefore, we conclude that the constructed assessment framework can effectively evaluate and monitor the construction process of age-friendly societies, providing a scientific basis for policy formulation and resource allocation. Keywords: Age-Friendly Societies, Health Cities, Performance Evaluation Framework

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3:15 PM –4:45 PM WEDNESDAY [Special Sessions]

Bali International Convention Centre – Mangupura Hall

Closing Plenary: Mental Health Economics at a Crossroads: Tackling Key Challenges in the Field

MODERATOR: **Claire de Oliveira**, Centre for Addiction and Mental Health

SPEAKER: **Rowena Jacobs**, University of York; **David Johnston**, Monash University; **Eduardo Banzon**, Asian Development Bank

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4:45 PM –5:30 PM WEDNESDAY [Social Events]

Bali International Convention Centre – BICC Foyers

Closing Refreshments

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