Key Concepts in Health Economics

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Lecture 2: Key concepts in health economics

This lecture should enable you to:

- Describe the concepts of efficiency, opportunity cost and marginal analysis
- Understand why these concepts are important in health economics
- Appreciate how they underpin 'the market' (as a prelude to lectures 3, 4 and 5)

Economics is about …

- Limited resources
- Unlimited "wants"
- ***Choosing*** between which 'wants' we can 'afford' given our resource 'budget'

Personal choice…

- For lunch I could have a…

Whopper meal deal (small)

Tall latte and blueberry muffin (to go)

Tuna sandwich & cracked pepper crisps

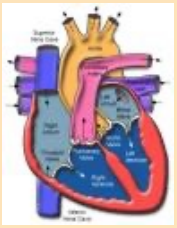
Pint of Guinness & packet peanuts

Government choice…

- Government could fund one IVF course or…

One-third of a cochlear implant

1 heart bypass operation



11 cataract removals

150 MMR vaccinations

One-thousandth of a Challenger 2 tank

Economists view of the world...

- Pessimist: bottle ½ empty
- Optimist: bottle ½ full
- Economist: bottle ½ wasted

inefficient!

Concept 1: efficiency

- **Efficiency**=making most of what we've got!
  - **Technical Efficiency** = producing maximum benefit (outputs) from given *inputs* (resources), or given level of benefit from least inputs
  - **Economic Efficiency** = producing maximum benefit from given *budget*, or given level of benefit at least possible cost (value of resources)
  - **Allocative Efficiency** = producing the *mix* of benefits (from a given set of resources) that is most highly valued

Example of efficiency

- Primary care clinic combines inputs to provide 'health' for a population:
  - consultation rooms, treatment rooms, office space, doctor time, nurse time, etc.
- Different possible combinations of inputs:
  - a larger waiting area and fewer treatment rooms, or more nurses and fewer doctors, etc.
- **Technically efficient:**
  - not possible to provide 'health' to any more patients without using more of at least one input (nurse time, doctor time, etc.)

Example of efficiency (cont.)

- Technical efficiency doesn't consider *cost*:
  - hour of nurse time vs hour of doctor time
  - different input combinations may be *technically* efficient but not all have the same overall cost
- **Economically efficient:**
  - combine inputs to provide 'health' at lowest cost
- Even if primary care clinic is economically efficient, may produce too much or too little
- **Allocatively efficient:**
  - no other mix of primary and (for example) secondary care that is more highly valued

Concept 2: opportunity cost

- How do we choose between which 'wants' we can 'afford' given our resource 'budget' to ensure we are being 'efficient'?
  - Assessment of the relative benefits that each course of action will produce
- The 'cost' is therefore the 'opportunity cost':

  "The value of forgone benefit which could be obtained from a resource in its next-best alternative use."

Opportunity cost and health(care)

Choice faced	If we decide to…	The opportunity cost is …
How much to spend on health care	To increase health care spending	Benefits foregone as a result of less education, defence, transport etc. spending
How much to spend in each health region	To increase spending in one region	Benefits foregone as a result of spending less in other regions
How much to spend on each service	To spend more on cancer	Benefits foregone as a result of spending less on maternity services
How much to spend on each patient group	To spend more on the young	Benefits foregone as a result of spending less on the elderly

Example of opportunity cost

Paediatric Care	Care of Elderly	Opportunity Cost
('000 children treated)	('000 elderly treated)	('000 elderly **not** treated if treat children)
0	30	0
1	28	2
2	24	6
3	18	12
4	10	20
5	0	30

Implications of opportunity cost

- Deciding to ***do*** A implies deciding ***not*** to do B (i.e. value of benefits from A>B)
  - Eg deciding to ***do*** more breast cancer screening same as deciding ***not*** to do more prostate cancer screening
    - Critical is whether benefits from doing more 'A' are greater than benefits lost from not doing 'B'
- Cost can be incurred without financial expenditure (as long as there is some value in the benefits foregone)
  - Eg informal sector, volunteer staff

Economics and money (again!)

- Remember from last lecture, money is…
  - Common store of value
  - Convenient means of exchange
- People convert goods they produce in to other goods they value, such as food or clothing, *through the medium of money*
- The price we observe is the 'exchange rate' between goods, and *may* be used to value goods (as it gives us (opportunity) 'costs')
- But having no *price* does not necessarily mean there is no (opportunity) *cost*!

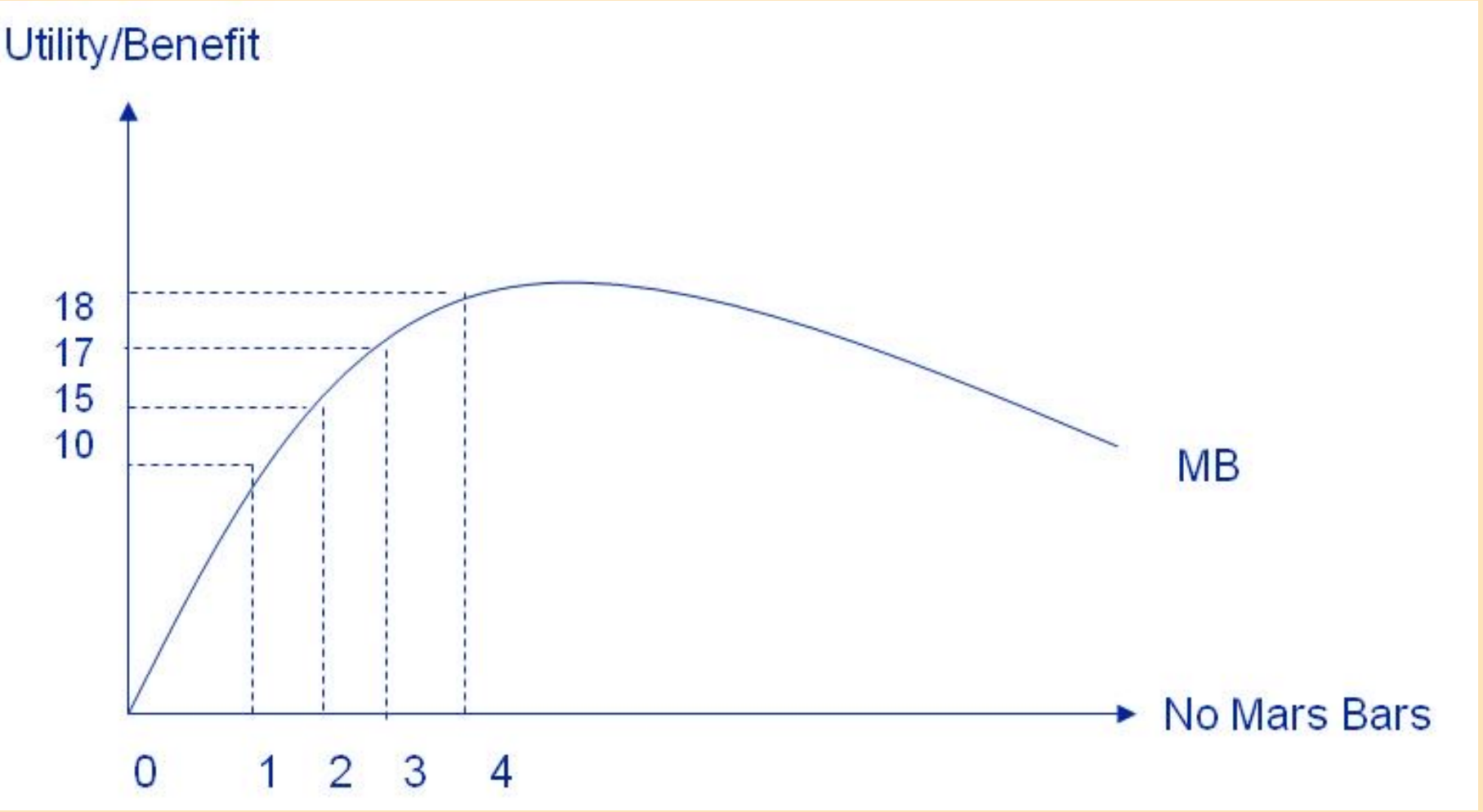
Concept 3: 'marginal' analysis

- Efficiency is achieved only by producing/ consuming something to the point where the (opportunity) ***cost*** of the last unit is no greater than the ***benefit*** derived from that unit.
- Choice over which course of action will be 'efficient' therefore requires assessment of ***relative*** (opportunity) costs and benefits of each ***marginal*** addition (or reduction):
  - in consumption (which underpins demand)
  - in production (which underpins supply)

Achieving efficiency using marginal analysis: an example

- Two goods we can allocate our budget to: Mars Bars and crisps
- How do we allocate this budget to maximise benefits (utility)?
  - Take each unit in turn and decide whether to consume ***that unit***
  - Look at additional (marginal) benefit each unit adds, as marginal utility *diminishes* as more units are consumed

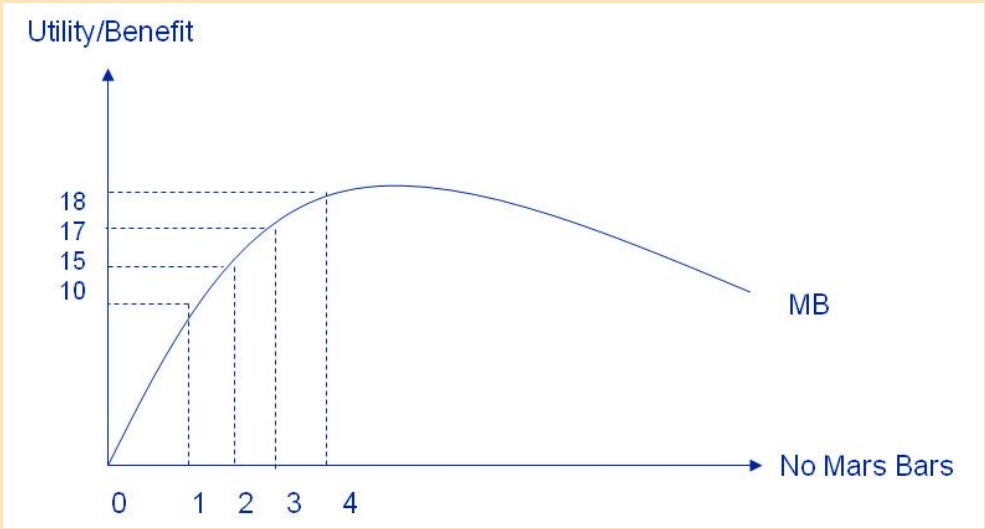
Diminishing Marginal Utility



Achieving efficiency using marginal analysis: an example

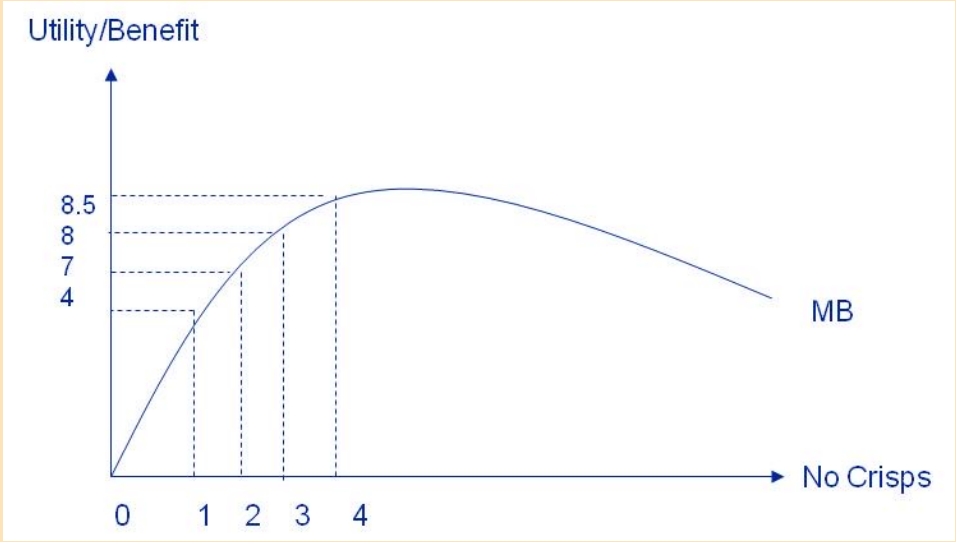
- Imagine we have a budget which means we could consume *either* 3 bags of crisps *or* 3 Mars Bars *or* some combination
  - Which would we choose?
- Allocate our budget one unit at a time until $MB_{\text{Mars Bar}} = MB_{\text{Crisps}}$.
  - As cost is 'opportunity cost', $MC_{\text{Mars Bar}} = MB_{\text{Crisps}}$ and so at this point $MC_{\text{Mars Bar}} = MB_{\text{Mars Bar}}$

Diminishing Marginal Utility



MB 1st Mars Bar = 10
MC 1st Mars Bar = 4
MB 2nd Mars Bar = 5
MC 2nd Mars Bar = 4
MB 3rd Mars Bar = 2
MC 3rd Mars Bar = 4

To maximise my utility (ie efficiency) I do not allocate my budget to 3 Mars Bars, but to 2 Mars Bars & 1 packet of crisps (total benefit = 19)



An example of transplantation

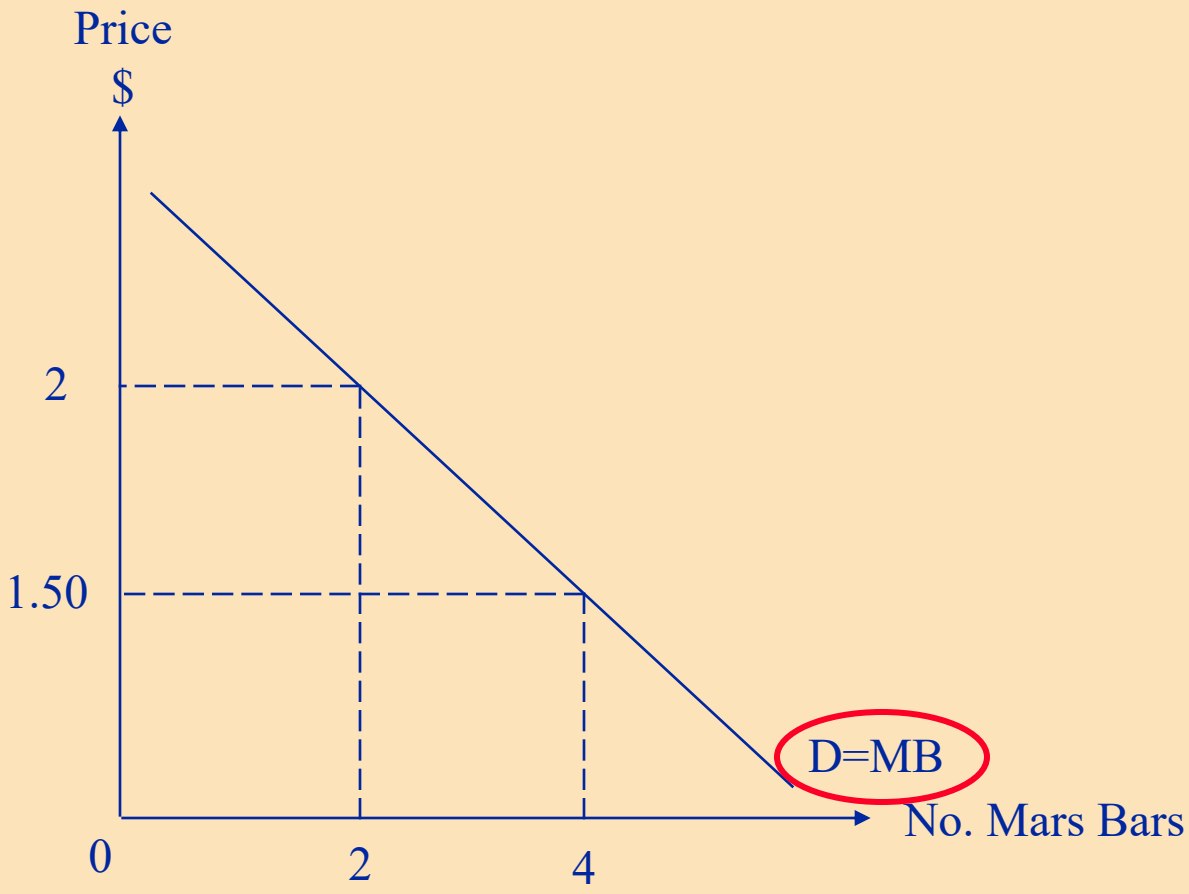
Number of transplants	Total cost	Total benefit	Average cost	Average benefit	Marginal cost	Marginal benefit
1	100	500	100	500	100	500
2	150	900	75	450	50	400
3	180	1200	60	400	30	300
4	230	1400	58	350	50	200
5	330	1500	66	300	100	100
6	530	1550	88	258	200	50
7	1030	1600	147	229	500	50

Represents benefits forgone elsewhere (remember $MB_B = MC_A$, so $MC_A = MB_A$)

Marginal analysis and 'the market'

- Marginal benefit and marginal cost lie behind the concepts of demand (lect. 3) and supply (lect. 4) which in turn are important in understanding the importance of 'the market' (lect. 5)
- Demand curve shows the quantity (in a specified time period) that an individual will be willing to buy at different prices
  - Amount an individual is willing to pay for a unit will depend on the marginal benefit from consuming it
  - MB falls the greater the quantity consumed
  - Demand curve thus slopes down from left to right

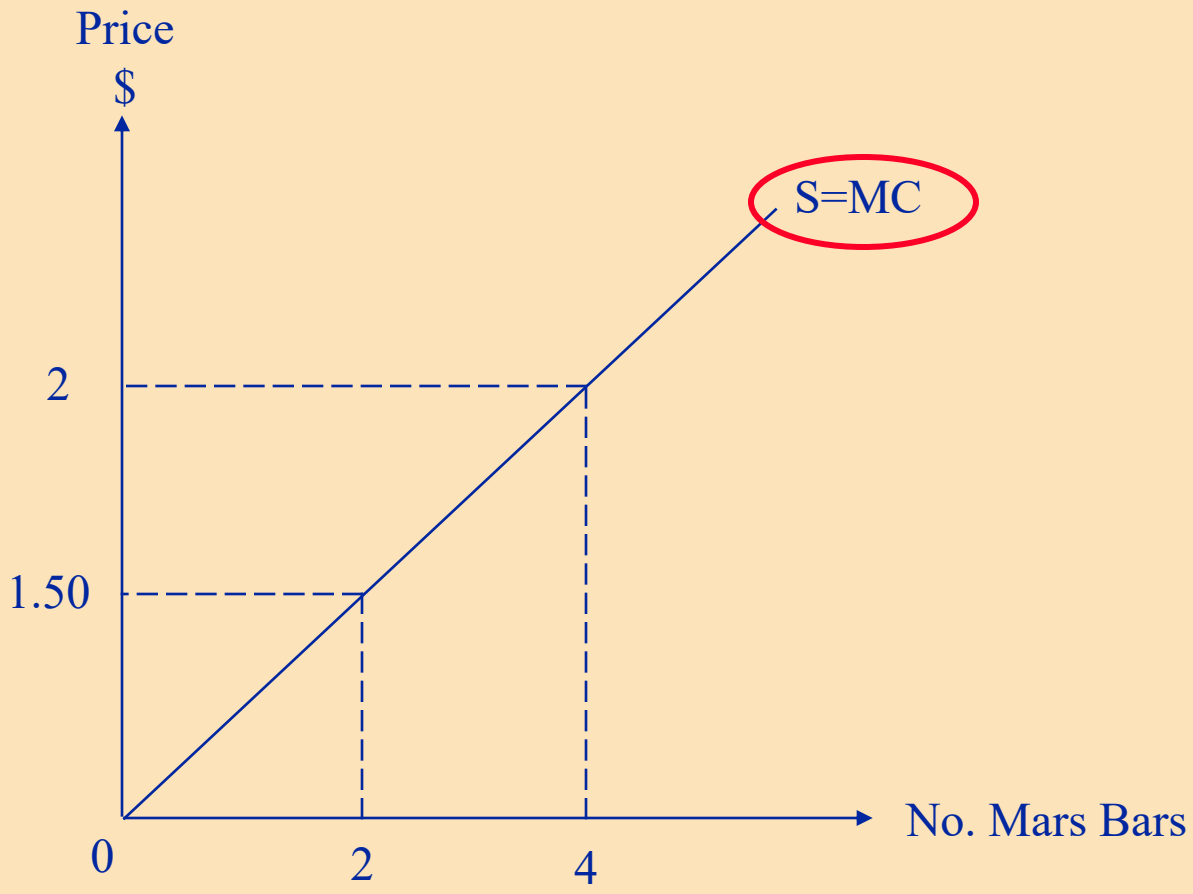
Demand curve



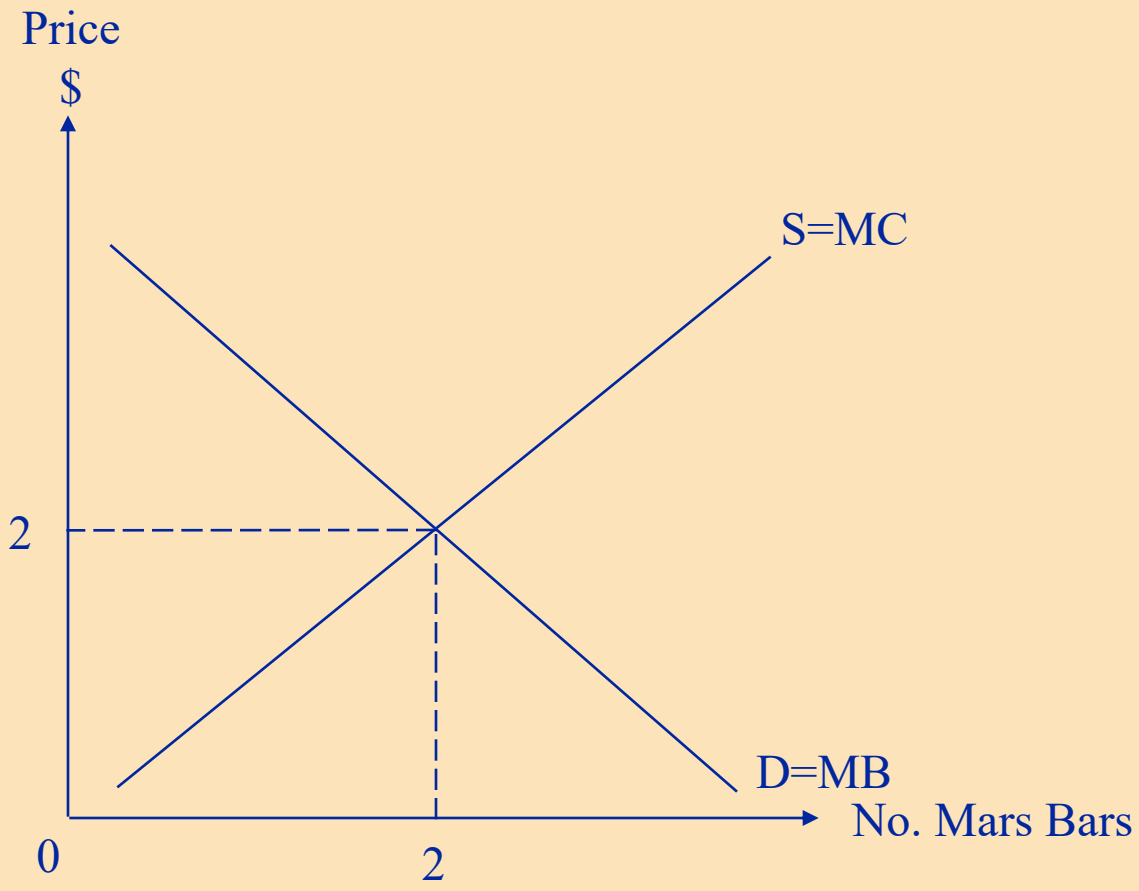
Marginal analysis and 'the market'

- Supply curve shows quantity producers willing to supply at different prices (at a given time)
- Marginal cost increases as output increases (because of *diminishing* marginal returns)
  - contribution of an input (eg nurses) to output (product) depends on levels of other inputs (eg beds)
  - as more nurses added to fixed number of beds the contribution of marginal nurse to output starts to fall, and marginal cost of producing output starts to rise
  - producers will then only be willing to produce greater amounts if compensated by a higher price
  - supply curve thus slopes upward from left to right

Supply curve



'The market' equilibrium: demand (MB) = supply (MC)



A final word…

- Health economics is concerned with the efficient allocation of scarce (health care) resources
  - Maximising benefit (health) for resources available
  - Requires technical, economic and allocative efficiency
- 'The market' is important because:
  - Firms only able to remain if *technically* and *economically* efficient (otherwise others undercut price)
  - *Allocative* efficiency is also achieved as for each good consumption/production is where MC=MB
    - as MC=marginal *opportunity* cost (MB foregone), resources are allocated such that MBs are equated across all available goods
- 'The market' ensures we get the most benefit for the resources we have…when it works!