

Health Economics

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Basic Economic Concepts

- Production Possibilities

- Factors of production

- These are the inputs used to create finished goods (or services), i.e., the product we pay for
 - This means that we choose how to allocate scarce resources
 - Ideally, our choice will depend on what maximises our wellbeing
 - Traditionally, the factors of production are:
 - Land
 - This includes land itself and other natural resources and phenomenon, such as, water, forests, coal, petroleum, weather etc.

Production Possibilities

- ❖ Labour

- * This is the human effort necessary to produce and deliver goods

- ❖ Capital

- * These are the manmade goods used to produce other goods, such as building, equipment, drugs and supplies

- ❖ Knowledge and skill

- * Formal qualification and experience and the ability acquired by training

- Criteria to allocate resources

- ❖ One desirable criteria must be to use all resources in a way to achieve their fullest capacity

- * i.e., to use fewest possible resources for any given level of output

- ❖ This situation is known as “Productive Efficiency”

Production Possibilities

❖ Another desirable criteria is that

- * The factors of production are all used to make type and quantity of goods that the society value most
- * For example:
 - ◇ Society may produce agricultural products more than the entertainment goods, or
 - ◇ Build more schools than temples

❖ Allocative efficiency

- * This is the term used to describe a situation in which productive resources are used to produce most value

Basic Economic Concepts

- Production Possibilities Frontier

- Production Possibility Curve

- ❖ Assume that there is a hypothetical hospital which can produce only two items using all its resources and technology efficiently

- ❖ These two products are

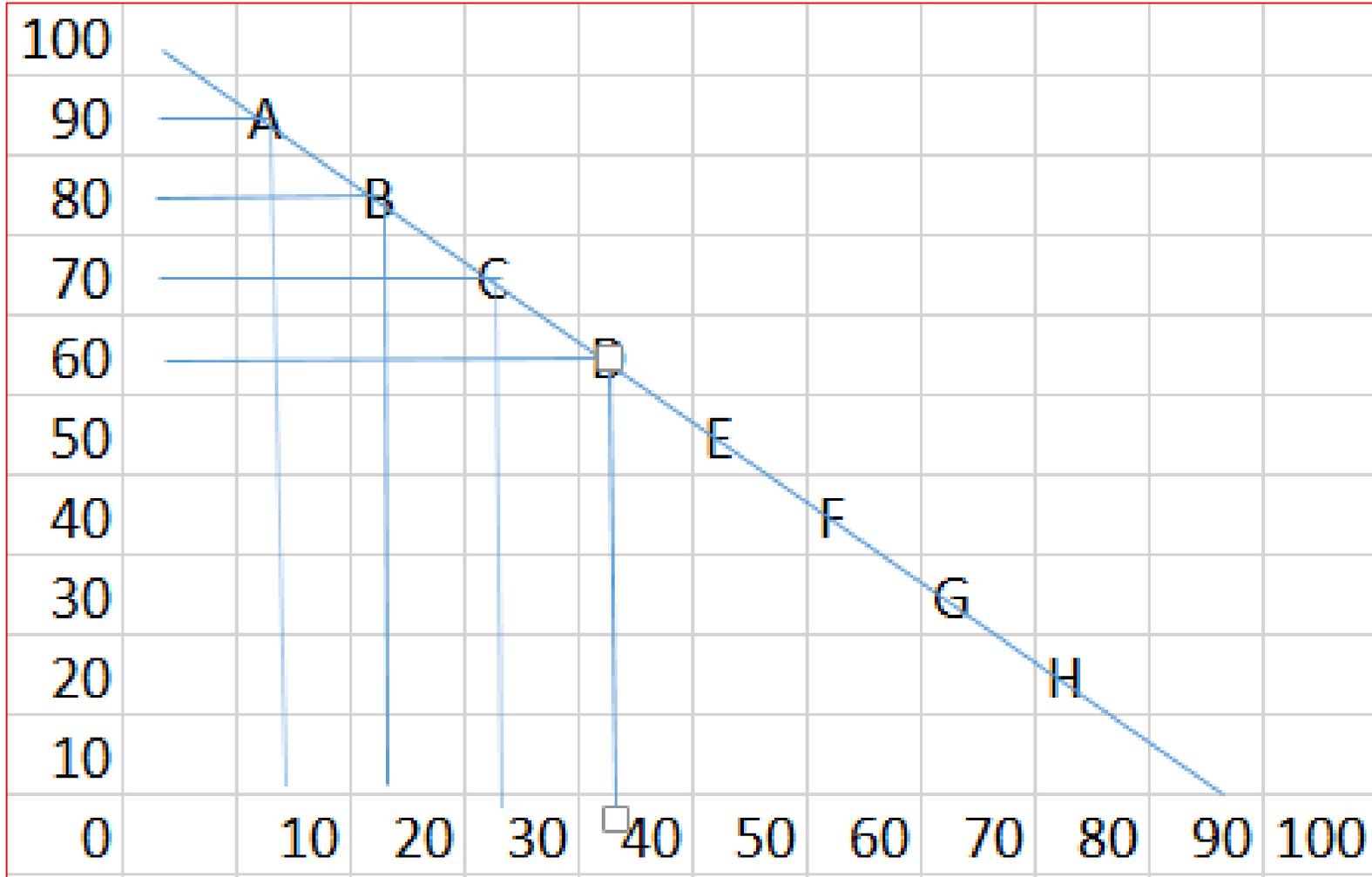
- * Inpatient procedures 100 with no outpatient procedure, or

- * Outpatient procedures 200 with no inpatient procedure, and

- * These two procedures in various combinations

PRODUCTION POSSIBILITIES FRONTIER

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This hypothetical hospital can only produce two products – outpatient care and in-patient care in various combinations efficiently using all its resources.

The graph shows the production possibility frontier or boundary. The inclined straight line is that boundary. Any production below the line means that the system is inefficient. Any point above the line is impossible to achieve currently with available resources

In-Patient

Points A B C D E F G H shows the different combination of productions, e.g., at point C there are 70 outpatient services and 30 in-patients services

Basic Economic Concepts

- Health Care as an Economic Good

- When applied to health care certain special characteristics need to be considered
- Economic analysis focuses on decisions and choices about the production and consumption of economic goods
 - ❖ Economic goods are goods or services that are scarce relative to society's wants for them
 - ❖ Health care resources used to produce them are finite
 - * Such resources are human resources, capital and raw materials
 - * Society can use more of these resources for production and consumption of health care by diverting them from other uses

Health Care as an Economic Good

- Society's wants for health care have no known bounds
- There is no limit to what the people would like to consume had there been no constraints on people's or nation's ability to pay for them
- No health care system anywhere in the world can meet this unlimited demand for health care for all the consumers
- As an economic good, choices must be made about the quantity and mix of health care to produce, how to produce it and how to distribute it
 - ❖ This is fundamental to economics – *the opportunity cost*

Health Care as an Economic Good

- Supply of goods and services depends on production under different circumstances and the cost of production in different amounts
- The quantity of health care product produced by a healthcare 'firm' is referred to as its output
- There are two opposing views about the definition of healthcare output
 - ❖ Ultimate aim of health sector is better health
 - ❖ That means the output of healthcare facility is changes in health

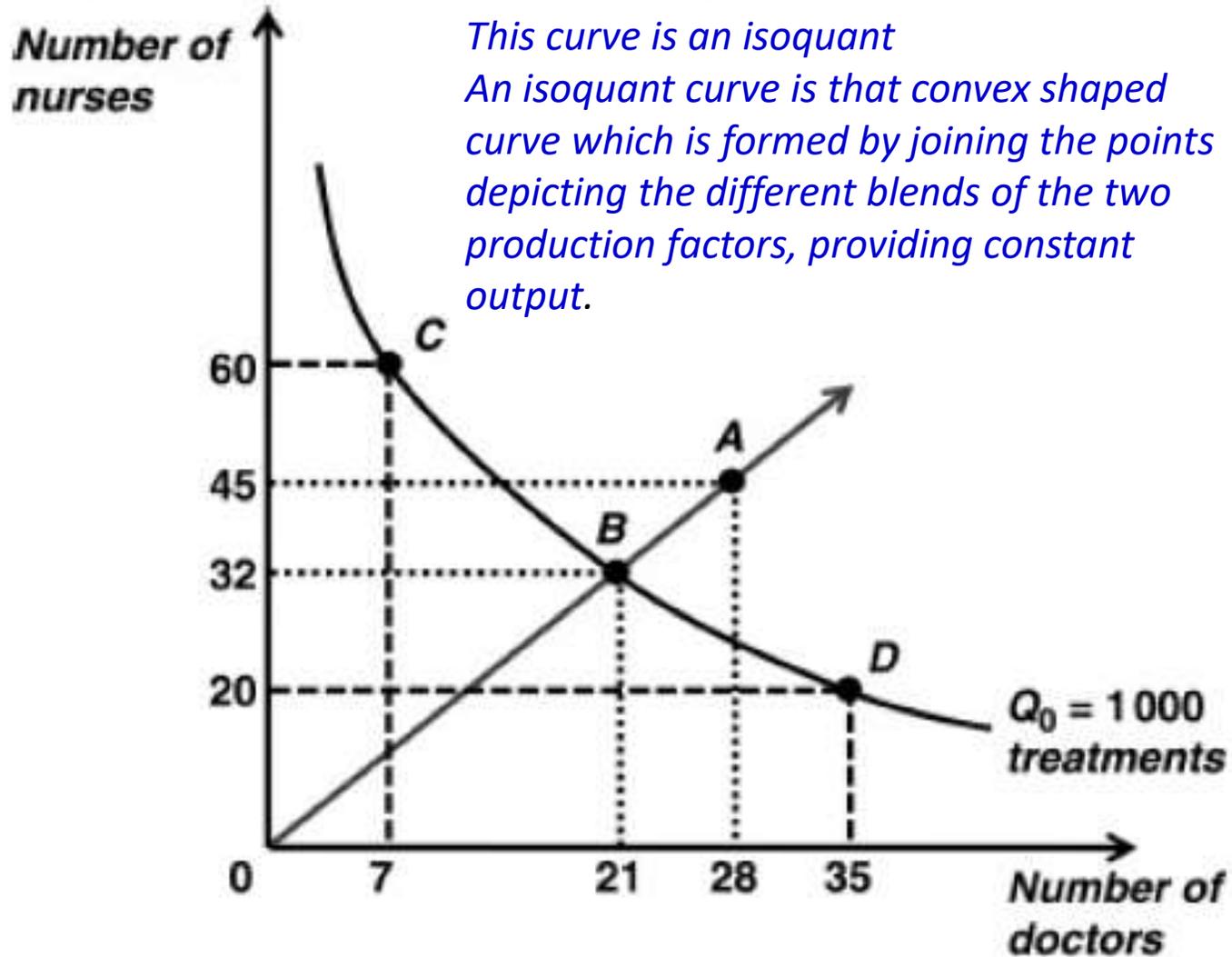
Health Care as an Economic Good

- The other view is only people can produce health
 - ❖ To do so health services are used
- In this case, the output of healthcare facility is the amount of care provided
 - ❖ This can be regarded as intermediate output, the final output being health
- Both these views of output have problems
 - ❖ Output that is measured as changes in health might not reflect the amount of health care provided
 - ❖ This more so when there is uncertainty about the success of treatment provided

Health Care as an Economic Good

- It is emphasised again that health cannot be traded
 - ❖ Therefore this will make it difficult to analyse health care market
- When the output is viewed as health care, this will ignore the main purpose of health care, that is to change health status
- This concept of output may lead to an erroneous conclusion while comparing two health care facilities
 - ❖ One facility may be judged as more productive when some of the health care that it provides does not affect health, or even is harmful
- Within this backgrounds, both measures of output are considered valid

Production function and isoquant



The key issues in analysing production efficiency can be demonstrated using a simple model in which there are only two inputs.

The accompanying figure shows for each possible combinations of these two inputs, the amount of output produced

Basic Economic Concepts

- Absolute Advantage and Comparative Advantage

- Absolute advantage

- ❖ The two firms produce the same output, but one firm produces that output using only fewer inputs or more efficient process

- * Then this firm has an “absolute advantage” over the other and can make profit

- Comparative advantage

- ❖ Absolute advantage can be contrasted to comparative advantage, which is when a producer has a lower opportunity cost to produce a good or service than another producer

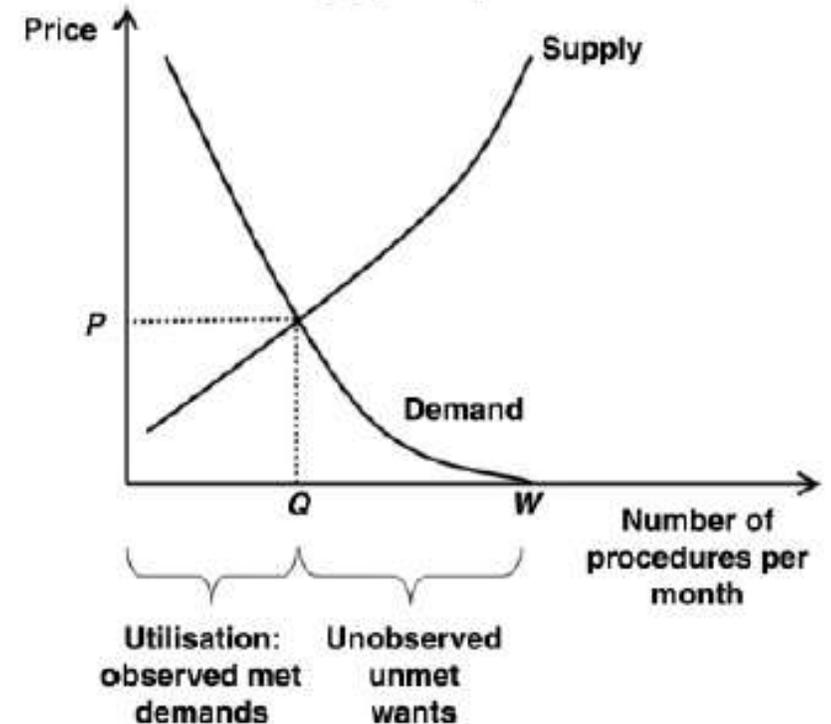
- ❖ The firms still can make profits from business if they specialise based on their respective comparative advantage

Demand

- Demand

- Economists define the demand for any good, including health care, as the quantity that consumers are both willing and able to buy
- The law of demand can be depicted in a downward sloping demand curve
- It states that other things being equal, the higher the price, the lower the demand

The demand for and supply of liposuction



Demand for Health

- Underlying the relationship between price and quantity is a behavioural model of consumers choices
- Consumer's choice theory explains why consumers behave or react in certain manner to changes in certain factors
- This theory is based on the idea that people obtain utility by consuming goods
 - ❖ Consumers choice is then based on the objective of maximising utility
- A model for demand for health was developed in 1970s by Michael Grossman
 - ❖ The model considers investment in health as a form of human capital

Demand for Health

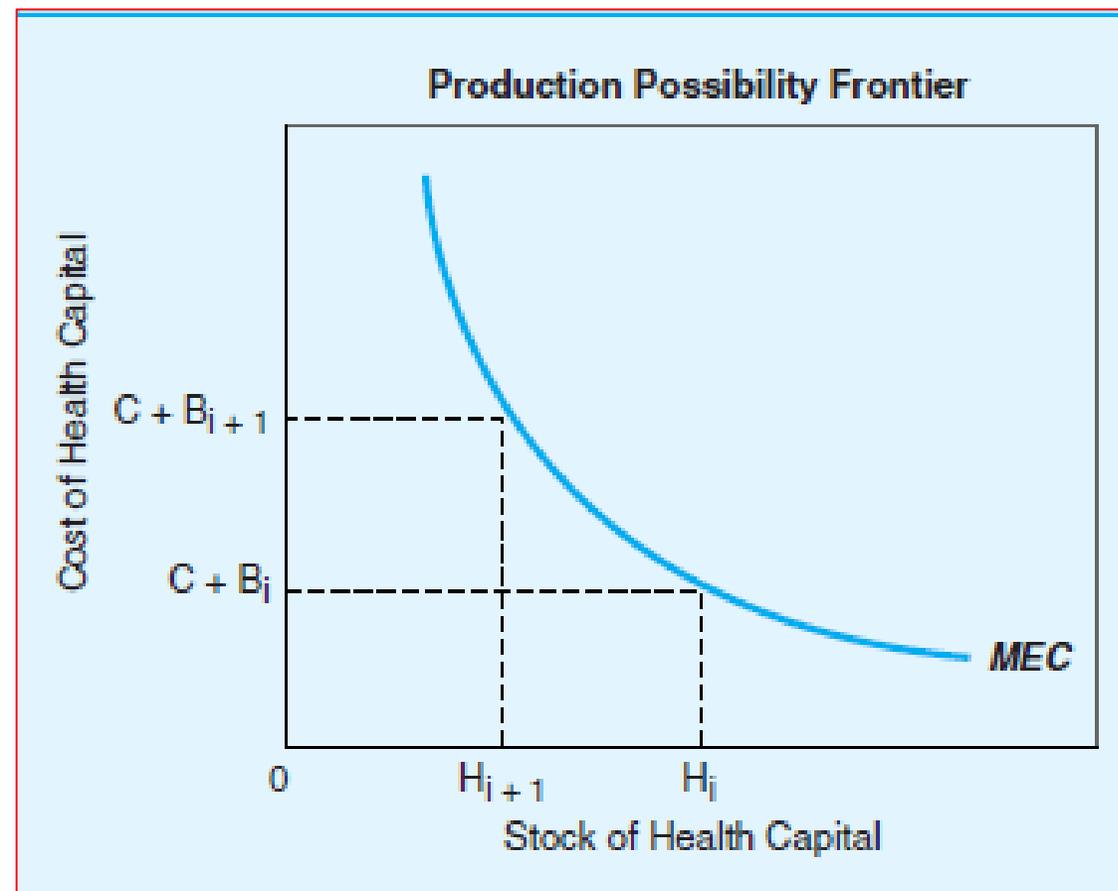
- An analogy between health care and machine repair is often made
 - ❖ A person might buy a machine in order to earn income as a consultant, e.g., consider the machine being a computer
 - * Here, the computer is a capital good
 - ❖ Or, a person may buy a computer to gain some pleasurable experiences, such as surfing the internet, chatting with friends or playing games
 - ❖ In this case also the computer is a capital good as it provides a stream of services that has monetary value and value of utility or consumption aspects

Demand for Health

- The consumption aspects would be the joy of playing a favourite game
- If the computer is only for pleasure, still it is a capital good because it gives a stream of services over time
- In order to improve the investment in computer, some preventive maintenance is necessary such as purchase of additional software such as anti-viral programme
- Routine maintenance of the computer is done to offset depreciation
 - ❖ This is part of the gross investment to the computer over the life of the machine
 - ❖ Gross investment includes the cost of purchasing the computer and its upkeep

Demand for Health

- **Marginal Efficiency of Capital (MEC)**
 - It is a measure of how much extra output can be produced with an extra input
 - The accompanying figure depicts the schedule of MEC of health capital
 - It shows how much extra expenditure is required to produce an additional stock of health



Marginal Efficiency of Health capital

Demand for health

- In the figure, stock of health capital is measured on the horizontal axis and the costs on the vertical axis
- The MEC curve slopes downwards:
 - ❖ This is because additional units of investment are assumed to yield smaller marginal improvements in the production of health
 - ❖ This is the phenomenon of production of health that is subject to diminishing marginal returns
 - ❖ In the figure, H_i and H_{i+1} are two levels of health stock chosen by an individual at different levels of costs of health
 - ❖ C depicts the total cost of health stock that includes the cost of offsetting depreciation and the cost of incremental units of health stock

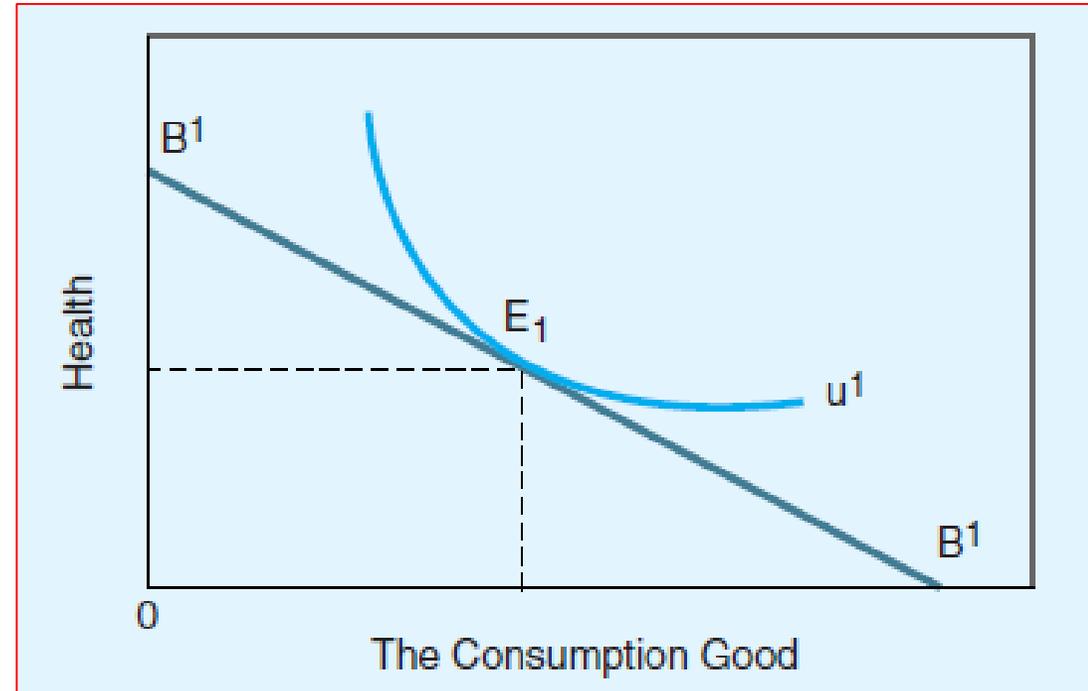
Demand for health

- The MEC schedule can be thought of as the demand curve for health
 - ❖ It is also a production function of health as it relates inputs and the output of the stock of health
- Once MEC schedule is known, it is possible to know the level the individual will choose to produce
 - ❖ A rational person will invest additional resources in the production of health to the point where the value of additional degrees of healthiness is just equal to the marginal cost of producing it
 - ❖ The MEC schedule is specific to individual
 - * The model does not assume that a given increase in inputs into health production function will generate the same marginal improvement in different people

Demand for health

- **The Consumption Model**

- The figure depicts a consumption model
- It shows trade-offs between investment good, health and consumption good
- The straight line is the budget line (income)
- Different combinations of health and consumption good that can be purchased with the income levels is shown



Trade-off between the investment good, health, and consumption good

Demand for health

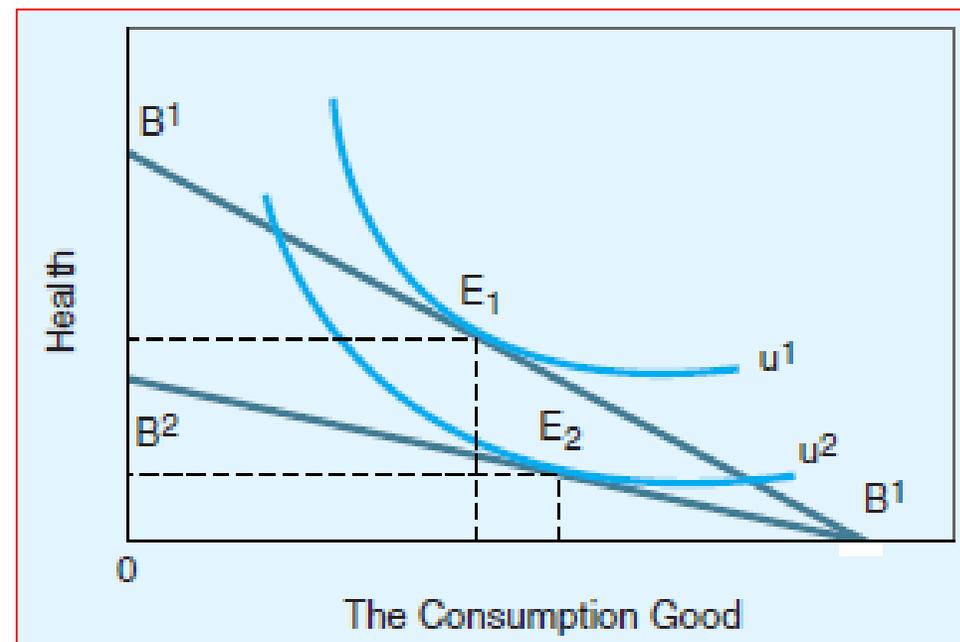
- The quantity of goods that can be purchased from a budget depends on the prices of goods
- The slope of the budget line is determined by the relative prices of the goods
 - ❖ These goods are health and consumer goods
- U is an individual's *indifference curve*
- The indifference curves show the various combinations of health and consumption goods
 - ❖ The combinations of the goods provide an individual with an equal amount of satisfaction or utility
 - ❖ A higher indifference curve shows higher level of total utility

Demand for health

- Standard assumption is that both the consumption good and health are subject to diminishing marginal utility
 - Indifference curves can be drawn in the usual way
 - ❖ The curve is convex to the origin
 - Productivity of a person in the work place is likely to be affected by one's health
 - ❖ Therefore investment in health could increase earnings
 - ❖ The increase in earning accruing from investment in health care would depend on the extent of investment without reducing the presumption of other goods

Demand for health

- Additional factors that affect the investment in health
 - Age
 - ❖ As one ages, there would be more need of investment to obtain a given stock of health
 - ❖ In contrast older people are not charged more for consumer goods
 - ❖ In fact some goods may attract concessions, such as air line fare
 - ❖ Therefore, the relative prices for producing health in comparison to purchase of goods tend to increase with age
 - ❖ The substitution effect (relative price effect) would necessitate substitution of other consumer goods for investment in health as one ages



Shifts in relative prices

Demand for health

- ❖ In the previous figure, an increase in relative price of health is shown by a decrease in the slope in the budget line from B_1B_1 to B_0B_1
- ❖ This results in a new optimal combination of health and other goods as in E_1
- ❖ A person with serious illness may decide it is not worth investing in the minimal health stock to stay alive

○ Education

- ❖ Both investment and consumption models to analyse the effects of education on the demand for health can be used
- ❖ Evidence exists that more educated people are more efficient in the production of health
- ❖ Education shifts the MEC curve out to the right
 - * This is done through the productivity of inputs into the production of health

Demand for health

- ❖ This effect is seen in all countries – both in low and high income countries
- ❖ It has been hypothesised that education is correlated with a lower rate of depreciation in the stock of health
- ❖ This is demonstrated as downward movement along the MEC curve
 - * As the MEC curve is associated with a lesser cost of production of health stock
- ❖ It is expected that there is an increase in the demand for health associated with an increase in education
- ❖ As seen, education make investment in health less costly
 - * And also may be associated with different **time preferences**

Demand for health

- ❖ ***Time preference*** refers to the extent to which people discount the future
 - * A preoccupied person with the present ignores the future
 - * This means the person discounts the future very heavily
- ❖ This type of person is not likely to save or invest much in either education or health
- As shown, investment in education is correlated with investment in health
 - ❖ But it is not certain whether the education has the same effect on investment in health care provided increased efficiency in the production of health enables the use of fewer resources to attain any given level of health

Demand for health

○ Lifestyle Effects of Wealth

- ❖ As people become wealthier the MEC curve may shift to the left

 - * They eat richer food and shun exercise

- ❖ These are negative inputs for producing health capital

- ❖ Research had shown that as the economy moves upward, it produces a negative effect on healthiness

 - * In low-income countries economic improvement may have a positive impact due to improvement in nutrition and accessibility to health care

○ Chemical Dependency

- ❖ How the habit forming drugs influences health capital can be viewed from both the investment and consumption models

Demand for health

- ❖ Addiction shifts the marginal efficiency of health capital curve to the left, and
 - * Also it can cause a change in taste that would result in the substitution of additive good for expenditure on health
 - * Example:
 - ◇ Preventive care may be sacrificed in order to afford more addictive drugs
- ❖ Addition causes a reduction in time taken for in decision making
 - * This is consistent with a diversion of resources away from investing in health to purchasing “utility producing” addictive goods
- Based on above reasoning, anything that increases the stock of health capital will tend to reduce drug dependency
 - ❖ As a corollary, better opportunities in the labour market needs more healthy days to take its advantage
 - ❖ This will tend to discourage chemical dependency

Demand for Health Care

- Health Care Demand

- To produce health capital, certain inputs are necessary
- Health care is one such input into the production function of health
- Therefore health production shall demand health care as an input
- Health care is different from other inputs
 - ❖ It has no utility other than promoting health unlike other consumption goods such as cars, clothes etc.
 - ❖ Demand for healthcare is dependent on ill health, hence it is unpredictable
 - ❖ Levels of expenditure may be manifold in comparison to household income and wealth

Demand for Health Care

- Anything that increases the demand for health also increases demand for health care
- Example:
 - ❖ Higher wages makes healthy days more valuable
 - * This will, in turn, increase the demand for health and health care
 - * An exception to this may be when one needs more time to get the required health care, e.g., waiting for an appointment
 - ◇ In this case if the time price of health care is more than the expected value of health care then the hidden demand will not be manifested

Demand for Health Care

- Technology and demand for health care
 - ❖ Demands for health care depends on the particular production function for health
 - ❖ Production function of health needs to consider a particular technology employed
 - ❖ Technological inputs in health care has increased the use of medical input in the production of health
 - ❖ This technology has also increased expectation about attainability of health and, therefore, have increased the demand for health itself
 - ❖ In turn, this increases the demand for health care

Demand for Health Care

- The Effect of education on demand for health care
 - ❖ This effect is less predictable
 - ❖ Education may reduce the demand for health care
 - * Education may make a person more aware of value of good nutrition, exercise, good sleep, positive thinking and prevention of disease
 - * This awareness and practice of health habits will reduce the quantity of health care required to produce a given stock of health
 - ❖ Education can also increase the demand for health itself
 - * Those who are more educated and likely more aware about health may demand more health but less health care
 - ❖ Therefore, these ifs and buts, makes effect of education less certain

Demand for Health Care

- The effect of age on demand for health care
 - ❖ The demand varies depending on type of health care required
 - ❖ For example,
 - * Demand for ambulatory care decreased with age
 - * But demand for inpatient services and pharmaceuticals increased
 - ❖ However, when health status is included in the estimation including age on the demand for health care, age is no longer significant
 - ❖ Most likely, deterioration of health status with age itself, increases the demand for health care

Demand for health care

- Effect of insurance on the demand for health care
 - ❖ It primarily affects the price of health care
 - * This is a movement along the demand curve
 - ❖ While analysing the demand for health care, the concept of need is important to consider
 - * This consideration of need is important from the point of view of
 - ◇ the characteristics of health policy and
 - ◇ an individual's consumption of health care
 - * In most cases, the need and not the demand characterises the aims of health care

Demand for health care

- Demand for consumer goods and demand for health care are two different things
 - ❖ For consumer goods demand is based on utility, i.e., getting some pleasure out of it
 - ❖ No body demands health care for getting pleasure out of it, rather this demand is based on their perceived need for improving health
 - * Rarely, there would be some who demand health care without any need as they may pessimistically think that their health status is low, or
 - ◇ Optimistically, are mistaken about the possibilities of improving it, e.g., popping in some vitamin pills when there is actually no need of this nutritional supplement

Demand for health care

- ❖ However, more importantly, in some cases there may be need but there is no demand
 - * E.g., Many adolescent girls may have anaemia but they do not seek health care as they are unaware because of lack of health literacy
 - * This need can be revealed by targeted health survey
- ❖ If health services respond only to demand, then there is unmet need
 - * Unmet need also may be due to restricted accessibility to health care
 - * This may be due to supply factor, such as inadequate health services coverage, like in rural areas or in difficult terrain
 - * Or, this could be due to demand factors such as prices and income levels that affect a persons ability to pay thus this is economic inaccessibility

Demand for health care

- Asymmetry of Information and Imperfect Agency

- Health care market is uncertain

- ❖ This uncertainty is due to uncertainty in diagnosis, available treatments, and effectiveness of those treatments

- Some of the uncertainty is irreducible

- ❖ Here, neither the doctor nor the patient would know with certainty what the consequences of treatment will be

- ❖ This leads to the problem of unmet need

- ❖ However, much of this uncertainty is one sided

- * Consumer lacks the medical training and knowledge to make informed choices

Demand for health care

- Information is itself an economic good
 - ❖ Needed information can be obtained by various types of consumer research
 - ❖ Obtaining information this way may be worthwhile only when benefit exceeds the cost
- Consumer may choose to be “rationally ignorant” when,
 - ❖ The costs of obtaining information is too high
 - ❖ Information is highly specialised or difficult to obtain, or
 - ❖ The likely benefits are too low

Demand for health care

- Under these circumstances consumers may delegate the decision making to the supplier of the service
 - ❖ Usually, the patient's contact with the doctor is when the doctor tells the patient what he or she should do
- Doctor-patient relationship is often presented as a principal-agent problem
 - ❖ Doctor is the agent who acts on behalf of the principal to make decision about what health care to purchase
 - ❖ Principal is the patient
- A doctor may be a perfect agent when
 - ❖ The doctor makes these decisions that is fully consistent with patient's preferences
 - ❖ And without any consideration of consequences for themselves

Demand for health care

- ❖ This means that the doctor is making the health care decisions that the patient would have done if they had access to the same information
- Economic literatures have shown that doctors either cannot or do not act as perfect agents
- Supplier-Induced Demand (SID)
 - ❖ The hypothesis of SID proposes that
 - * Doctors engage in some persuasive activity to shift the demand curve in or out depending on physician's self-interest
 - ❖ Many studies were carried out to show the effects of increased availability of doctors on the utilisation of health care
 - * The studies failed to show that observed movements in prices and quantities can prove inducement
 - * As a corollary there is no data to disprove it either

Demand for health care

- Financial incentives and demand
 - ❖ Comprehensive review of literature demonstrates that
 - * Physicians do respond to financial incentives, and
 - * They do appear to influence demand, and
 - * They do so partly in response to self-interest
 - ❖ Even with this research definitive understanding of Supplier-induced demand remains elusive
- To confirm
 - ❖ Whether patients are being induced to demand more services than they really want
 - ❖ We would need to know how much they would have demanded if they were as well informed as the physician
- No such study has been conducted

End of Part 3