
UNIT 19 HEALTH ECONOMICS

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19.0 OBJECTIVES

After studying this unit you should be able to:

- explain basic concepts of health economics and its application in health sector,
- discuss various techniques of economic evaluation;

- analyse demand, supply and price mechanism; and
- describe the various ways of resource generation and their allocation.

19.1 INTRODUCTION

In this unit you will learn about the basic concept of Health Economics, demand and supply mechanism and how they operate, some about the production function and briefly about how to generate resources, their allocation and utilization. The achievement of objective for health for all requires that resources are made available to health sector and are used efficiently. As the economic recession has exacerbated the problem of financing the health sector. The available funds are not always used in ways that will have maximum impact on the health of the people. This unit provides introduction to health economics for health professionals and presents basic economic concepts and their potential application in the field of health.

19.2 DEFINITION OF HEALTH ECONOMICS AND ITS APPLICATION IN HEALTH AND HOSPITAL PLANNING

19.2.1 Definition of Economics

To understand health economics and its contribution to health and hospital planning, the starting point is definition of health economics. Samuelson, the author of one of the mostly read text book of economics, defines economics as:

“The study of how people and society end up choosing, with or without use of money, to employ scarce productive resources that could have alternate uses, to produce _various commodities and distribute them for consumption, now or in the future among various persons and groups in society.”

It analyses costs and benefits of improving patterns of resource allocation. Economics do not restrict itself to any particular activity, but it applies to all activities wherever there is scarcity and need for making choices. Therefore, it is the study of scarcity and choices.

Positive Economics It is about describing and analyzing decisions to do with scarcity and choice. It is concerned with what is or was, or will be.

Normative Economics: It makes judgment about the norms or standards to be applied. It determines what should be and not merely what is.

Health Economics: It can be defined as “application of the theories, concepts and techniques of economics to the health sector.”

It is concerned with:

- 1) allocation of resources among various health promoting activities.
- 2) the quantity of resources used in healthcare delivery.
- 3) organizing and funding of the health institutions.
- 4) efficiency with which the resources are allocated and used for health purposes
- 5) the effects of preventive, promotive, curative and rehabilitative health services on individuals and society.

Marketing and Health Economics 19.2.2 Contribution of Health Economics to Health planning

Health planning and health economics are both about choices. Health planning is choice between one future or another; choice between various ways of achieving that future. Health economics also relates to choose about how to optimize the use of resources within various activities. Economic considerations play a key role in all aspects of life such as industry, housing, agriculture, health etc. The major determinant of the country's health status is the level of economic development. Health policy of the country is strongly influenced by the economic considerations. Vice versa the health of the population can also influence the economic progress of the country. For example, to improve the social and economic welfare of people requires strategy which demands selection of those health programmes which improve health most efficiently such as health services, the provision of other health infrastructure such as water and sanitation, or action at improving nutrition etc. Health economics can help to evaluate such choices. Governments are actively seeking ways of containing costs, increasing efficiency and finding additional resources. Health economics is important as it helps to improve the allocation of resources, increase their efficiency, identify most cost-effective technologies and evaluate alternate sources of health finance.

Check your progress-1

- i. Define health economics.
- ii. List the concerns of health economics.

19.3 ECONOMIC DEVELOPMENT AND HEALTH

Economic development is a process having number of aspects. The three important aspects are economic, demographic and health.

19.3.1 Economic Development

Economic development is a broader concept than economic growth. When the economies grow in terms of national income and per capita income, certain structural changes accompany the process of growth. Conceptually the trends in income and the structural changes together constitute economic development. Income per head varies between nations and there is systematic relationship between income and other differences which include production patterns, consumption patterns, demography, health and health inputs between rich and poor countries. In poor countries, agriculture is more important, smaller population lives in towns, people spend relatively more on food and little on consumer durables.

19.3.2 Demographic Development

Economic development results in demographic transition. In the earlier part of the century, population has grown very slowly because high birth rates have been offset by high death rates. But with economic development; richest countries are again in a situation of low population growth because lower birth and death rates.

But in transition the death and birth rate do not move in step. Death rate falls first and in combination with high birth rates produce a period of very rapid population growth. Only when birth rate falls population will stabilize. This

may take decades. Therefore, the demographic transition has also its own momentum but is partly controllable. The speed at which birth rate follow the fall in death rate, is believed to depend on the fact that greater child survival causes parents to desire less children. Therefore, there is justification in making huge expenditure on population control programmes.

19.3.3 Health Development

It is a process by which population moves from low level of health to high level of health. The nature of these changes can be seen in case of infant death. At lower levels of health i.e., high infant mortality rate, most infant deaths are associated with communicable diseases like, diarrhea and respiratory conditions. At intermediate levels the common infectious diseases are replaced by range of conditions which require institutional care. At high levels of health (IMR 10 or less) infant deaths are reduced to a core of congenital conditions and expensive treatment and scientific interventions required. For children and young adults, the same basic pattern is found. However, in older age the gap between countries with low and high general level of health tends to narrow, e.g. infectious diseases are much less important relative to chronic and degenerative diseases such as cancer, stroke, diabetes, arthritis and mental conditions which are common to all countries.

Relationship between Economic, Demographic and Health Development

Economic development provides the extra resources for better nutrition, better housing and sanitation, health services and technology. This leads to lower mortality, which triggers demographic development. But it is not always that simple, for example, unless the demographic transition is completed, many of the gains from economic growth will be absorbed by high rate of population increase. Economic development promotes better health but better health, by reducing burdens of sickness and uncertainty, facilitates economic development. The relationship between economic, demographic and health development is a complicated system of interacting variables.

19.3.4 Production and Health

Economic development is usually accompanied by changes in pattern of production which interact with health of the population. Their interaction may have unfavorable effects on health and damage to health may be direct and concrete e.g. Bhopal Gas Tragedy in 1984 and Chernobyl disaster in 1986. In some cases, there is indirect effect, e.g. irrigation leads to increased agricultural output but creates a suitable environment for the spread of water borne disease such as schistosomiasis, the use of insecticides results in the emergence of resistant strains of malaria mosquito, making control of malaria more difficult.

In some cases, from the economic point of view the development is always potentially favorable to health and health care industry.

19.3.5 Distribution and Health

The proceeds of economic development are not necessarily equally distributed between persons and groups (e.g. resources for health services, income in general etc.). Strict equality is not possible for health services in

Marketing and Health Economics general. What is sought is equity i.e., fair shares for all obtained through the avoidance of inequalities which are not necessary or socially acceptable. Health services like many forms of production are subject to diminishing returns i.e., the more resources that are applied to given population, the less the increase in output (health) obtained from adding one more unit of output.

19.3.6 Consumption and Health

Patterns of consumption tend to vary in a predictable way with income. Income-Consumption relationship can be understood through the economic concept of elasticity of demand. The income elasticity for a particular category of consumption say health, can be defined as percentage change in expenditure on that item i.e., health, associated with a 1% change in the consumer's income. Income elasticity of more than one means an item of consumption takes increasing share of total expenditure as income increases. Medical care has an income elasticity of more than one.

At national level, poor country will spend 2-3% of national income on health care where as richest countries spend up to 10%.

19.4 ECONOMIES OF SCALE AND MONOPOLY

The relationship between input and output as the scale of production increases can be represented on a scale known as Economies of Scale or Scale of Economic efficiency. Economic efficiency deals with the least combination of the inputs, which will produce the desired output e.g. given the hospital fixed budget; output that can be maximized alternatively given a fixed quantity of services.

Economies of Scale has three forms:

- Constant returns to the scale.
- Increasing returns to the scale (Economies of Scale).
- Decreasing returns to the scale (Diseconomies of scale).

19.4.1 Constant Returns to Scale

When input increased in same proportion, it is possible for the output to increase at same rate, e.g. if the inputs in the immunization programme such as vaccines, publicity, immunization centres are increased by say 10% and the number of children vaccinated also increase by 10%, the programme is experiencing constant returns to the scale.

19.4.2 Increasing Returns to the Scale (Economies of Scale)

When output increases at a higher rate as compared to input i.e. for the example given above if the number of vaccinated children increase by 15% or more the programme is experiencing increasing returns to the scale. This is known as economies of scale. This phenomenon of the output rise at a higher than the rate of increase of input on account of larger volume of input is referred as economies of scale.

As the scale of production increases, managerial inefficiency and problems of large scale production are seen eventually leading to diseconomies of scale.

Economies of scale are important in planning of programmes, planning for hospitals, planning for facilities etc.

19.4.3 Decreasing Returns to the Scale

When output increases at a lower scale as compared to input i.e. the number of vaccinated children increase by say only 5%, the programme is experiencing decreasing returns to

the scale. This is known as Diseconomies of scale.

19.4.4 Monopoly

A monopoly exists when a firm or individual produces or provides and sells the entire output of same commodity or service, e.g., if only one pharmaceutical company is the manufacturer of a particular drug and sells the same in the market. There are some instances of economies of scale and tendency to natural monopoly in health care. Examples include hospitals and pharmaceutical firms. More often, the market is characterized by a limited degree of competition between two large producers (i.e. oligopoly). Price competition may be reduced in these circumstances by collusion. Competition, instead gets limited to non-price competition, for instance advertising of brand names.

Check your progress-2

- i. What is the relationship between Economic, Demographic and Health Development
- ii. List the Economies of Scale.
- iii. Define monopoly.

19.5 EXTERNALITIES (SPILL OVER EFFECTS)

Externalities exist when the level of consumption or production of some good or service by a consumer or firm has a direct effect on the level of welfare of another consumer or firm, as opposed to indirect effect through the price mechanism. Certain activities have spillover effects on other producers or consumers. These effects are called externalities. These effects may be desirable or undesirable. A very good example in the health field is the protection against disease provided to others when an individual is immunized. Another example is public health measures such as sewerage and drainage.

Externalities can be positive (beneficial), or negative (i.e. harmful). A particular type of externality is known as Public Good. These are commodities or services that, can be used, consumed or enjoyed by increasing number of people without diminishing the amount available to others, are available to everyone in the catchment area independent of the size or existence of payment, cannot be withheld from non-payers. Health care service characterized by the problem associated with public good is malaria control through environmental management (e.g. cleaning ponds). Here it is not possible to exclude non-payers from the benefits.

19.6 PRODUCTION FUNCTION

Production is the process of producing goods and services, which satisfy human wants. There are three components common to all production activities:

Marketing and Health Economics **Input:** Various resources such as manpower, equipment available for production capacity.

Process: Describes the transformation or productive technique which changes inputs into desired outputs.

Output: It is the end result of production.

In economics, the relationship between these components is described within the framework of production function. Production function is a way of representing, both qualitatively and quantitatively, the relationship that exists between inputs and outputs.

The relationship between input and output is represented by a production function of the type:

$$Q = f(L, K, T)$$

Q = output, L = labour, K = capital, T = the way L&K are combined.

It says that output (Q) is a function of combination of labour (L) and Capital (K), and the way in which they are combined (T)

Health care systems are not simple productive units. They produce many different types of outputs simultaneously and sometimes even unintentionally.

The way these outputs are produced is often poorly understood and it is often difficult to relate particular output to any one interaction or activity.

The Production Process

- A) The production process has following components:
- 1) Final outputs e.g. longer life, better health related quality of life.
 - 2) intermediate outputs e.g. reduction in symptoms, fewer cases of a disease, changes in a disease stage.
 - 3) Activities e.g. tests carried out. vaccinations given, surgical procedures performed.
 - 4) Inputs e.g. doctors, nurses, health promotion staff, buildings, equipment etc.
- B) The production process is concerned with turning 4 into 1.
- C) Theory of production The production theory enables us to raise issues like:
- What are the feasible ways of producing outputs?
 - What are the efficient ways of producing outputs?
 - What is the cheapest way of producing outputs?

The basic premise is that there are always many different ways of producing a final output, the differences may be of strategy such as:

Example 1: Reduction in deaths of Very Low Birth weight babies using surfactant replacement therapy or by treating mothers with corticosteroids.

Example 2: Reduction in malaria morbidity by nets, vector control or prophylaxis. Example 3 Reduction in TB by immunization or treatment

with antibiotics. Further within a basic strategy there may be a choice as such.

Example 4: Substitution of junior doctors for senior, substitution of nurses for junior doctors, substitution of alarmed monitors, for observation.

Example 5: Day's care for in patient surgery.

Example 6: Litiotripters for "keyhole" surgery, 'keyhole' surgery for open procedures.

Interventions may be quite different, but aim is for the same intermediate output (e.g. stone free gall bladder).

- D) Given the choice of ways of producing final outputs, the choice should be based on minimizing the cost of achieving any given output. The best method can change if the relative cost of inputs change (e.g. a wage rise for one category of staff, cheaper equipment), or when technology changes.
- E) Production can exhibit increasing, constant or decreasing returns to scale.

Increasing returns to scale are more common where it is possible to change the technology in use above a certain level, or where some necessary input is only partially used, e.g. since herd immunity becomes possible. There are also possibilities for scale economies in providing for services with large uncertainty (e.g. accident services).

Where services are very labour intensive, and the ratio of staff to patients is constant, then constant returns to scale are likely. Decreasing returns to scale are likely when access is costly, when management problems arise at larger outputs.

- F) Production is feasible whenever combinations of inputs can be turned into outputs.
- Production is efficient when it is not possible to reduce the use of any one input (holding other inputs constant) without a loss of output.
 - The cheapest efficient production will depend on prices of inputs.

19.7 EQUITY AND HEALTH

Equity in health implies that ideally everyone should have a fair opportunity to attain their full health potential and, more pragmatically, that no one should be disadvantaged from achieving this potential, if it can be avoided.

Equity is, therefore, concerned with creating equal opportunities for health and with bringing health differentials down to the lowest level possible. Equity in health care is defined as:

- equal access to available care for equal need.
- equal utilization for equal need.
- equal quality of care for all.

Marketing and Health Economics Unequal access to health services may be due to:

- differentials in income, religion, race, sex, age or other factors not directly related to the need for care.
- high transport costs.
- inconvenient opening hours of health facilities.
- language and cultural barriers.
- resources and facilities being unevenly distributed around the country.
- resources spent on high technology medical services catering to only small segment of population.

Principles of Equity

- a) Horizontal equity
— equal treatment of equals
- b) Vertical equity
— unequal treatment of unequals

General Principles for Action

- 1) Equity policies should be concerned with improving living and working conditions such as safe housing, clean drinking water, controlling pollution etc.
- 2) Enable people to adopt healthier life styles.
- 3) Decentralize power and decision making, encouraging people to participate in decision making process.
- 4) Making high quality health care accessible to all.
- 5) Health impact assessment.
- 6) Research, monitoring and evaluation.

Is equity Achieved through Market

Markets do not necessarily result in equity, e.g. market exacerbates income inequalities by allocating goods or services according to the ability to pay thereby undermining the health of those who cannot afford health care. Therefore, some intervention is required to protect those who are most likely to be sick and least able to afford health care.

Check your progress-3

- i. Define Externalities.
- ii. Define Production. List its components.
- iii. What is Equity in health care
- iv. List the principles for Equity.

19.8 TECHNIQUES OF ECONOMIC EFFICIENCY

19.8.1 Economic Efficiency

In everyday use efficiency means value for money. For economists it has precise meaning. In health sector it means use of health resources in such a way that population is as healthy as possible. It deals with the least cost

combination that will produce desired output and in fixed budget how output can be maximized or given fixed quantity of services in a hospital how cost can be minimized. To achieve economic efficiency two criteria's must be met i.e. Effectiveness and Efficiency.

Effectiveness

It identifies the technical considerations for transforming inputs into outputs. There are many ways of achieving an output. Some of them may use inappropriate technologies or more resources than are necessary to produce a given level of output. Effectiveness is concerned with process of minimizing waste or effort when achieving an objective.

Efficiency

It takes into account the cost-of resources used in production and then compares them with the cost of the output produced. In other words, it relates to output per unit cost of the resources employed. Resources are being used effectively if a given output is produced at a minimum cost, or maximum output is produced at a fixed cost.

19.8.2 Operational Efficiency

Producing given output at minimum cost or maximize output for given cost.

19.8.3 Allocative Efficiency

Allocate resources between health and other objectives in relation to the value society places on health relative to other social objectives and the cost of achieving those objectives.

There are three conditions for achieving efficiency:

- i) Correct mix of outputs.
- ii) Technically efficient production process.
- iii) Least cost combination of inputs.

Techniques of economic evaluation concerns in achieving these three conditions.

Techniques of Economic Evaluation

Definition

“The quantitative analysis of the relative desirability to the whole community of investing in, alternative projects or programmes.”

The desirability is assessed in terms of both costs and consequences. Consequences is used as generic term for the beneficial results of the programme.

Essential Features of Economic Evaluation

- Desirability assessed through comparing costs and benefits (effects)
- Comparison of alternatives
- Concerns with costs and benefits to whole society (not just Government)

Forms of Economic Evaluation

There are many forms of economic evaluation but only those forms, which examine both costs and consequences for two or more alternatives can be described as economic evaluation studies. The various forms-of economic

Marketing and Health Economics evaluation are:

- 1) Cost Minimization Analysis.
- 2) Cost Effectiveness Analysis.
- 3) Cost Benefit Analysis.
- 4) Cost Utility Analysis.

Cost Minimization Analysis

It is based on prior epidemiological findings. The technique identifies the least cost intervention, e.g. if reduction of disability is achieved to the same degree by two interventions than which is the least cost intervention to achieve reduction of disability.

Cost Effectiveness Analysis

It does not question the objective. It finds out the best way of achieving a desired objective by comparing effects with costs. It evaluates either:

- Which of the number of possible interventions will achieve a given health objective for least cost, or
- Given a fixed budget, the intervention that maximizes the effectiveness of expenditure.

Results are expressed as costs per unit of output i.e. total cost of intervention divided by total health effect or as effect per monetary unit i.e. total health effect divided by total available resources.

Examples

- 1) Finding out cost effective methods for schistosomiasis control from amongst chemotherapy and water, chemotherapy alone, water supplies, or molluscicides.
- 2) To find out most cost effective test for cancer screening.

The problem of cost effectiveness analysis is that it cannot take account of multiple effects or consequences. It also cannot tell how large a programme should be.

Cost Benefit Analysis

It investigates whether the benefits of a project or programme exceeds costs. It involves identifying, measuring and valuing all relevant costs and benefits over an appropriate time period. In cost benefit analysis objectives can be questioned. It values both costs and benefits in monetary terms and is expressed by benefit / cost ratio i.e. benefits divided by costs. If the cost / benefit ratio is more than one, the project / programme is worthwhile, e.g. Cost benefit analysis for three programmes to eliminate severe vitamin A deficiency i.e. Public health intervention or monosodium glutamate fortification or mass dosage Vitamin A.

Cost Utility Analysis

It is a form of cost effectiveness analysis but it measures effects of the project or programme in terms of utilities. Like cost effectiveness analysis it can focus either on minimizing costs or maximizing effects. Results are expressed in terms of Quality Adjusted Life Years (QALY) or QALY's per monetary unit. It permits choice between wider range of options.

The most commonly used techniques of economic evaluation are cost benefit and cost effectiveness analysis.

Problems of Economic Evaluation

- Technical problem due to lack of information and the shortcomings of units of effect.
- “Efficient is not always sufficient” as the sole criterion for decision making.
- The economic evaluation techniques are used inappropriately to impose value judgments of specialists on the community as a whole.

Strengths of Economic Evaluation

- Methods for obtaining the best value for money from the use of available resources.
- It provides framework within which to consider the use of resources.
- They have important role to play in management issues, where the emphasis is on assessing how best to provide services rather than identification of priorities for investment, e.g. services should be provided in health facilities or homes.

Check your progress-4

- Define Effectiveness and Efficiency
- List the conditions for achieving efficiency.
- What are various forms of economic evaluation?
- Define Cost Minimization Analysis, Cost Effectiveness Analysis, Cost Benefit Analysis and Cost Utility Analysis.

19.9 DEMAND, SUPPLY, ELASTICITY OF DEMAND AND SUPPLY

In order to optimize use of scarce resources, an efficient information system is required to bring together the values of the alternative uses of resources (products) with their-production cost, and to co-ordinate the many decisions of consumers and producers. The price or exchange system, although imperfect, attempts this difficult task and plays a central role in economic analysis. It influences many health and health care programmes either directly or indirectly (e.g. through markets for personnel, drugs etc.). It is thus important to consider the workings of the price system, through an examination of demand and supply.

19.9.1 Demand

Demand is the desire for a good combined with the willingness and ability to get the desires fulfilled. In economics, the quantity of a particular good demanded is seen as a variable determined by a range of factors.

The demand function summarizes this relationship:

$$Q_d = f(P, RP, Y, T, \dots)$$

The quantity demanded (Q_d) is sum function of the price of the good (p) the prices of other related goods (RP); income (Y); and the organisational and

Marketing and Health Economics institutional structure of society and preferences and tastes of individuals (T) which will depend on many socio-economic and cultural factors. The demand function can represent the demand of an individual demanding a particular good in which case it is simply the sum of individual demands.

Demand Curve

The relationship between demand and price is often portrayed as a demand curve (Fig. 19.1). It illustrates how much would be demanded at each price. For most goods, more is bought as the price falls and the demand curve will slope downwards. In using a two-dimensional drawing of the demand curve, it is assumed that the other factors (RP, Y, T) remain constant. As far as health care is concerned there may be some exceptions to the downward slope e.g. addiction.

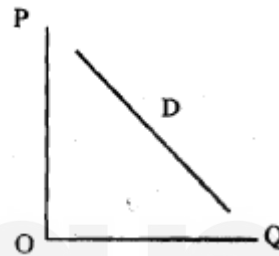


Fig 19.1: Demand Curve

19.9.2 Elasticity

The degree of responsiveness of one variable changes into another. If responsiveness is high, it is termed as elastic; if low, inelastic.

Elasticity of Demand

It is the responsiveness of demand to change in variables. It is reflected in the shape of demand curve.

Price Elasticity of Demand

Price elasticity of demand is measured by expressing the percentage change in quantity demanded (Qd) as a proportion of the percentage change in price (P).

$$\% \text{ change in } Q_d = E_d$$

$$\% \text{ change in } P$$

If the percentage change in Qd is greater than the percentage change in price, the demand for a good is elastic, $E_d > 1$. If the percentage change in quantity demanded changes by less than the percentage change in price ($E_d < 1$) the demand is inelastic. If the percentage change in price evokes a similar change in percentage quantity demanded then the demand is unitary elastic, ($E_d = 1$). Plasticity will depend upon the ease with which goods can be substituted for one another.

Income Elasticity of Demand

It measures the response in quantity demanded (Qd) which arises from changes in income (Y):

$$\% \text{ change in } Q_d$$

$$\% \text{ change in } Y$$

Cross-elasticity of Demand

It measures the response in quantity demanded of good A (Q_{da}) which arises from changes in the prices of other goods or services (P_b):

% change in Q_{da}

% change in P_b

It measures the degree of association amongst goods, i.e. whether they substitute or complement (need to be used with) each other. An example of substitute could be day care/in-patient care and example of complementary care could be diagnostic/curative services.

19.9.3 Supply

In economics, supply is used in a sense symmetrical with demand. The quantity of a good that producers offer for consumption is seen as determined by certain economic variables, of which the most important is the price at which the good can be offered.

Supply Function

it is the function relating to the quantity supplied to the variables likely to affect it.

$$Q_s = f(P, RP, C, RC, T, \dots)$$

The quantity supplied (Q_s) is some function of the price of the good (P), relative prices (RP), costs (C), relative costs (RC), and tastes (T) which will include socio-economic and cultural factors.

The supply curve (Fig. 19.2) shows the relationship between the price and the quantity supplied. It will normally slope upwards indicating that more will be supplied if prices rise. The notable exception is the supply of labour, which in some situations has a backward bending supply curve above a certain wage level.

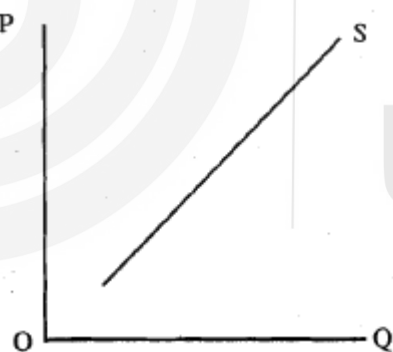


Fig. 19.2: Supply Curve

Elasticity of Supply

The ease with which quantity supplied will respond to changes in price is measured by the elasticity of supply, and it is reflected in the shape of the supply curve.

The elasticity or responsiveness of supply is roughly measured by pressing the percentage change in quantity supplied (Q_s) as a proportion of the percentage change in price (P):

% change in Q_s

% change in P

Like the elasticity of demand, supply is described as elastic where $E_s > 1$ and inelastic where $E_s < 1$. Elasticity will depend upon the ease

Marketing and Health Economics with which quantities of goods or services can be produced. In some cases, over an appreciable time span it may be difficult to obtain any more goods, irrespective of the price offered, e.g. agricultural crops or production where the scale of activities is fixed in the short term.

Equilibrium

Equilibrium in a market is achieved when supply equals demand (Fig. 19.3). Price and -quantity will adjust until the point is reached where buyers and sellers are content to exchange a given quantity (q_1) at a given price (P_1). The price so obtained will be the equilibrium price i.e. the value of the good of the consumer and producer is in equilibrium.

At P_2 suppliers will be willing to supply more than buyers are willing to purchase at that price. There will be excess supply and pressure to reduce prices. At P_3 buyers will be willing to buy more than suppliers are willing to offer and there will be pressure on prices to rise excess demand,

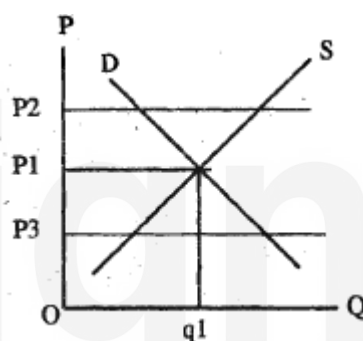


Fig. 19.3: Equal Supply and Demand

Supply, Demand and Policy

Supply and demand analysis can be used to consider policy changes such as the introduction of a tax on production and consumption of a good or subsidy on price or a policy of price controls.

Policy Instruments

Policy instruments used to intervene in the price system are:

- Fiscal policies — taxes or subsidies
- Control policies — limiting quantity (quotas) or price
- Regulations — setting out conditions for exchange — whether, when, where, by whom and of what standard
- Information/education, advertising to change values
- Changing property rights

These instruments could be used to correct market imperfections and the demand and supply of a good or services can be controlled.

Taxation

Tax is introduced to raise revenue or change behaviour. Fig. 19.4 shows the effect of a tax. Price has risen and quantity purchased has fallen. The extent of the rise or fall will depend upon the tax change and the relative elasticities of the supply and demand curves.

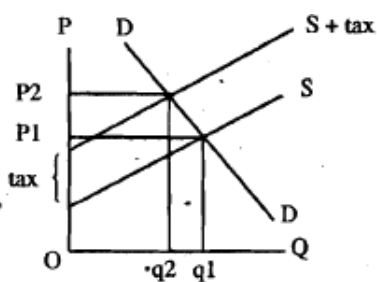


Fig. 19.4: Effect of Tax on Behaviour

Subsidy

Subsidy is introduced to protect the income of the producers, aid or protect an industry or to encourage use of a product by consumers who otherwise might be deterred by prices.

Fig. 19.5 shows the effect of a subsidy. Price has fallen and quantity purchased has risen. Again, the extent to which changes occur depend on the responsiveness of demand and supply.

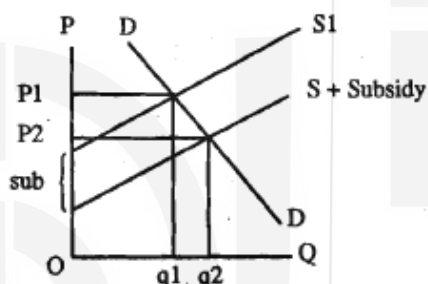


Fig. 19.5: Effect of Subsidy

Price Controls

Any Government can by decree fix the prices. The prices so fixed can be equal to, above or below the equilibrium price.

Fig. 19.6 shows the effects of the imposition of a price control (P2) above equilibrium price (P1). Price has risen and quantity demanded has fallen but excess supply (q1-q2) is available; unless this is managed there will be pressure on the market to bring down prices.

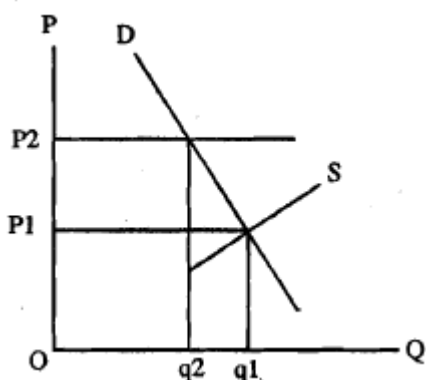


Fig. 19.6: Effect of Imposition of Price Control above equilibrium Price

Marketing and Health Economics Fig. 19.7 shows the effects of the imposition of a price Control (P_2) below equilibrium price (P_1). Price has fallen and quantity has fallen. At this price there will be excess demand ($q_1 - q_2$) and pressure to bid up the price unless some form of rationing is introduced.

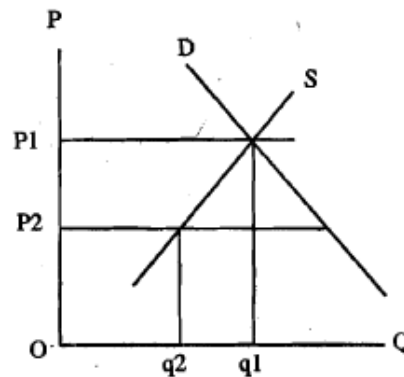


Fig. 19.7: Effect of Imposition of Price Control below equilibrium Price

Taxes and subsidies can be used to promote health. For example, taxes can be imposed on health-damaging substances (e.g. cigarettes) or on polluting industries, thus raising their price and reducing consumption/production. The extent of the reduction will depend on the relevant elasticities. Similarly, subsidies can be used to promote consumption or production by in effect lowering the price of health-promoting activities (e.g. zero-priced antenatal screening or dental and eye checks).

Externalities and Demand/Supply Analysis

Values, as expressed by the amount people are willing to pay, reflect only the private assessment of values and no account is taken of society's values. If there is a difference between the individual's and society's valuation of a good or service, externalities exist, i.e. factors are important that are external to those taking part in the transaction. You have already learnt about externalities earlier.

Demand or Consumption Externalities

If there are positive external benefits from the consumption of a good or service, society's demand curve will be to the right of the individual demand curve e.g. immunization, preventive medicine (Fig. 19.8); if there are negative external benefits from the consumption of a good or a service, society's demand curve will be to the left of the individual demand curve e.g. smoking and consumption of fat (Fig. 19.9). In either case, without intervention, over or under-consumption would occur.

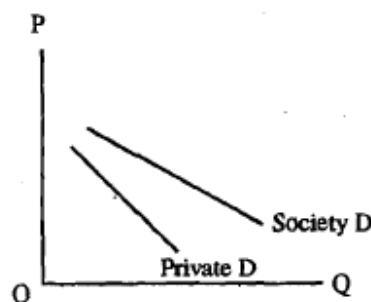


Fig. 19.8: positive external benefit

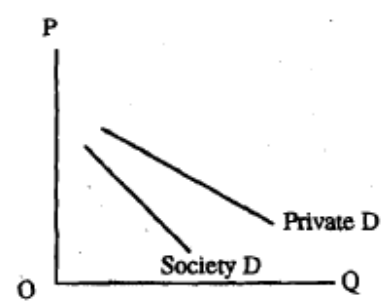


Fig. 19.9: Negative external benefit

A similar situation might occur on the supply side (Fig. 19.10). The costs which underlie the supply schedule only represent the private costs borne by the supplier. There may be costs borne by others as a result of the activity undertaken when producing goods e.g. river pollution, noise pollution or the use of scarce resources.

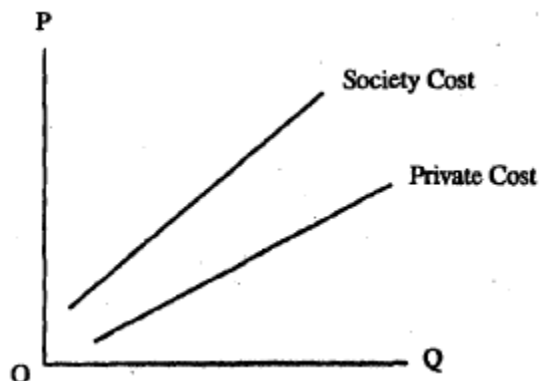


Fig. 19.10: Supply Externalities

Alternatively, the process may provide benefits in terms of amenities that can be used for other purposes and society’s costs would then be below private costs.

Again, over- and under-consumption would occur if no intervention takes place. Intervention may take the form of taxes or subsidies of services, legislation to control output or price, or direct intervention in production and distribution of services.

19.10 HEALTH SECTOR FINANCING

Finance means provision of money as and when required. Health financing means raising of resources to pay for goods and services, financing of health care does affect the provision and utilization of health services. Financing of health care is vital not only because of scarcity of resources but also sustainability of resources and resource efficiency considerations. The lack of information about health sector financing has undermined appropriate decision making.

The studies of health sector finance have two main purposes, related to health sector problem: to investigate the efficiency of health sector and to provide information for financial planning. The information can be valuable for:

- Identifying who benefits from services?
- Identifying who gets what?
- Identifying current patterns of financing and encouraging discussion on alternative source of finance.
- Identifying and quantifying resource deficiency.
- Analysing resource deployment and identifying possibilities for re-deployment.

Marketing and Health Economics **Methods of Health Care Financing**

Health care financing can be through public or quasi-public sources and private sources.

Some of the methods of health care financing are enumerated below.

- a) Public and Quasi-public sources of finance:
 - i) General tax revenues
 - ii) Deficit financing
 - iii) Earmarked taxes
 - iv) Social insurance
 - v) Lotteries & betting
- b) Private source of finance:
 - i) Private health insurance
 - ii) Employer-financed scheme
 - iii) Charity and voluntary contributions
 - iv) Community financing
 - v) Direct household expenditure

Criteria for Evaluating different Methods of Financing Health Care.

- 1) **Efficiency:** Four aspects of overall efficiency with which financing mechanism raise and use finance are raising adequate sources, stability or reliability of financing sources, net use of the source and freedom and flexibility in the management of the funds.
- 2) **Equity:** To see the impact of equity of health care financing options it is important to ask 'who pays'? One way is that only those who benefit from the use health care (that is the sick or potentially sick) should pay for it — horizontal equity. The other way is that the distribution of the burden of paying for health care should reflect difference in ability to pay — vertical equity.
- 3) **Demand/utilisation:** Different financing methods have different effects on the level and type of service used. Some methods of payments influence consumer behaviour by the incentive to provide us to withhold or provide services.
- 4) **Supply/provision:** The method of financing affects the supply or provision of services. There may be bias with respect to the type of expenditure that they favour i.e. favouring curative rather than preventive services.
- 5) **Displacement effects-:** Instead of generating additional resources new financing methods may displace funding from other sources, e.g. foreign assistance may displace Govt. funding for health care.

Check your progress-5

- i. What is Demand? List the factors on which affect demand function.
- ii. Define Elasticity, Elasticity of Demand, Price Elasticity of Demand, Income Elasticity of Demand, supply, Elasticity of Supply, Equilibrium

- iii. How health financing is useful?
- iv. What are the *Methods of Health Care Financing*?

19.11 LET US SUM UP

In this unit you have learnt about the basic concepts of economics and its application in the health sector. You have also learnt about the economic development and its relationship with demographic and health development. Further you have learnt about three forms of economies of scale and monopoly. You also learnt about production function which is the process of producing goods and services that satisfy human wants and have three components namely input, process and output. You have also learnt about equity in health which aims at creating equal opportunity for health and bringing health differentials down to the lowest possible level. You also learnt about the techniques of economic evaluation which include economic efficiency, operational efficiency and allocative efficiency.

You also learnt about four forms of economic evaluation namely cost Minimisation analysis, cost effectiveness analysis, cost benefit analysis and cost utility analysis. Subsequently you have learnt the concept of demand, supply and elasticity and their application in policy instruments, taxation, subsidy and price control. Towards the end of the unit, you have learnt about health sector financing which is not vital only because of security of resources but also sustainability of resources and resource efficiency consideration. This also includes various methods of health care financing including public and private sources of financing.

19.12 ANSWERS TO CHECK YOUR PROGRESS

Check your progress-1

- i. Define health economics.
It can be defined as “application of the theories, concepts and techniques of economics to the health sector.”
- ii. List the concerns of health economics.
It is concerned with:
 - allocation of resources among various health promoting activities.
 - the quantity of resources used in healthcare delivery.
 - organizing and funding of the health institutions.
 - efficiency with which the resources are allocated and used for health purposes
 - the effects of preventive, promotive, curative and rehabilitative health services on individuals and society.

Check your progress-2

- i. What is the relationship between Economic, Demographic and Health Development
Economic development provides the extra resources for better nutrition, better housing and sanitation, health services and technology. This leads to lower mortality, which triggers demographic development.

- ii. List the Economies of Scale.
It has three forms:
- Constant returns to the scale.
 - Increasing returns to the scale (Economics of Scale).
 - Decreasing returns to the scale (Diseconomies of scale).

- iii. Define monopoly.

A monopoly exists when a firm or individual produces or provides and sells the entire output of same commodity or service, e.g., if only one pharmaceutical company is the manufacturer of a particular drug and sells the same in the market.

Check your progress-3

- i. Define Externalities.

Externalities exist when the level of consumption or production of some good or service by a consumer or firm has a direct effect on the level of welfare of another consumer or firm, as opposed to indirect effect through the price mechanism.

- ii. Define Production. List its components.

Production is the process of producing goods and services, which satisfy human wants.

There are three components common to all production activities:

- **Input:** Various resources such as manpower, equipment available for production capacity.
- **Process:** Describes the transformation or productive technique which changes inputs into desired outputs.
- **Output:** It is the end result of production.

- iii. What is Equity in health care

Equity in health care is defined as:

- equal access to available care for equal need.
- equal utilization for equal need.
- equal quality of care for all.

- iv. List the principles for Equity.

General Principles are:

- Equity policies should be concerned with improving living and working conditions such as safe housing, clean drinking water, controlling pollution etc.
- Enable people to adopt healthier life styles.
- Decentralize power and decision making, encouraging people to participate in decision making process.
- Making high quality health care accessible to all.
- Health impact assessment.
- Research, monitoring and evaluation.

Check your progress-4

- i. Define Effectiveness and Efficiency

- Effectiveness-It identifies the technical considerations for transforming inputs into outputs. There are many ways of

achieving an output. Effectiveness is concerned with process of minimizing waste or effort when achieving an objective.

- Efficiency-It takes into account the cost-of resources used in production and then compares them with the cost of the output produced. In other words, it relates to output per unit cost of the resources employed. Resources are being used effectively if a given output is produced at a minimum cost, or maximum output is produced at a fixed cost.

ii. List the conditions for achieving efficiency.

There are three conditions for achieving efficiency:

- Correct mix of outputs.
- Technically efficient production process.
- Least cost combination of inputs.

iii. What are various forms of economic evaluation?

The various forms-of economic evaluation are:

- Cost Minimization Analysis.
- Cost Effectiveness Analysis.
- Cost Benefit Analysis.
- Cost Utility Analysis.

iv. Define Cost Minimization Analysis, Cost Effectiveness Analysis, Cost Benefit Analysis and Cost Utility Analysis.

- Cost Minimization Analysis-It is based on prior epidemiological findings. The technique identifies the least cost intervention, e.g. if reduction of disability is achieved to the same degree by two interventions than which is the least cost intervention to achieve reduction of disability.
- Cost Effectiveness Analysis-It does not question the objective. It finds out the best way of achieving a desired objective by comparing effects with costs.
- Cost Benefit Analysis-It investigates whether the benefits of a project or programme exceeds costs. It involves identifying, measuring and valuing all relevant costs and benefits over an appropriate time period. In cost benefit analysis objectives can be questioned.
- Cost Utility Analysis-It is a form of cost effectiveness analysis but it measures effects of the project or programme in terms of utilities.

Check your progress-5

i. What is Demand? List the factors on which affect demand function.

Demand is the desire for a good combined with the willingness and ability to get the desires fulfilled. The quantity demanded (Qd) is sum function of the price of the good (p) the prices of other related goods (RP); income (Y); and the organisational and institutional structure of society and preferences and tastes of individuals (T) which will depend on many socio-economic and cultural factors.

Marketing and Health Economics ii.

Define Elasticity, Elasticity of Demand, Price Elasticity of Demand, Income Elasticity of Demand, supply, Elasticity of Supply, Equilibrium

- Elasticity is the degree of responsiveness of one variable changes into another. If responsiveness is high, it is termed as elastic; if low, inelastic.
- Elasticity of Demand -It is the responsiveness of demand to change in variables. It is reflected in the shape of demand curve.
- Price Elasticity of Demand-Price elasticity of demand is measured by expressing the percentage change in quantity demanded (Qd) as a proportion of the percentage change in price (P).
- Income Elasticity of Demand-It measures the response in quantity demanded (Qd) which arises from changes in income (Y).
- Supply , in economics, is used in a sense symmetrical with demand. The quantity of a good that producers offer for consumption is seen as determined by certain economic variables, of which the most important is the price at which the good can be offered.
- Elasticity of Supply-The ease with which quantity supplied will respond to changes in price is measured by the elasticity of supply, and it is reflected in the shape of the supply curve.
- Equilibrium-Equilibrium in a market is achieved when supply equals demand

iii. How health financing is useful?

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Health care financing can be through public or quasi-public sources and private sources.

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Private source of finance Private health insurance, Employer-financed scheme, Charity