

HEALTH ECONOMICS



Presented by –

Dr. Anushka Gupta

PG IIInd Year

Deptt. of Public Health Dentistry

IDS, Bareilly

Contents

- Introduction
- What is Health Economics ?
- Aim of Health Economics
- Why Health Economics ?
- The building blocks of economics
- Economic evaluation
- Inputs and Outputs
- Types of economic analysis
- Economic Evaluation – Dealing with Uncertainty and Time
- The Scope of Health Economics
- Health Economics in Dentistry
- Conclusion

Introduction



Those responsible for determining and managing different areas of a health sector are typically forced to consider questions such as:

- At what level should hospital fees be set?
- Are taxes on cigarettes a useful way of promoting health through reducing the prevalence of smoking?
- Which is the more effective method of increasing the take-up of health services: price controls or subsidies?
- How should doctors be paid?
- Which treatments are the most cost-effective for people with HIV?

Introduction

- The discipline of economics is founded on the premise that there will never be enough resources to completely satisfy human desires, referred to by economists as scarcity.
- In the beginning, middle and end was, is and will be scarcity of resources.
- Questions of resource allocation, that is, how society's scarce resources are, could be or should be allocated amongst the infinite variety of competing activities, are fundamental to any study of economics.

Introduction

- The wide range of economic systems, which have existed and evolved over time, have all attempted to address the basic economic problem of allocating resources in such a way as to maximise the benefits for society.
- There are four specific questions that are the primary concern of economics:
 - What goods are being produced and in what quantities?
 - How are these goods produced?
 - How is society's output of goods divided among its members?
 - How efficient is society's production and distribution?

What is Health Economics ?



- In simple terms health economics has been described as the discipline of economics applied to the topic of health,

or

as ‘a logical and explicit framework to aid health care workers, decision-makers, governments, or society at large, to make choices on how best to use resources’.

(Health Economics: an introduction for health professionals by Ceri J. Phillips)

- The concepts of efficiency and equity lie at the heart of the discipline of health economics.

What is Health Economics ?



- It analyses how choices are structured and prioritised to maximise welfare within constrained resources.
- We all use economics on a daily basis as we work within our own resource constraints.
- By comparing the costs and benefits arising from the purchase of the competing choices, we are able to optimise our decision making.

What is Health Economics ?



- If we routinely use such economic techniques in our private lives, then surely it is not too great a 'leap of faith' to apply them in our lives as health professionals.
- This is the basis of health economics.
- Health economics reflects a universal desire to obtain maximum value for money by ensuring not just the clinical effectiveness, but also the cost-effectiveness of healthcare provision.

Aim of Health Economics



- Health economics seeks inter alia to quantify over time :
 - The resources used in health service delivery, their organization and their financing
 - The efficiency with which resources are allocated and used for health purposes
 - The effects of preventive, curative, and rehabilitative health services on individual and national productivity.

Why Health Economics ?



- Anyone who has worked in the health sector will be well aware of the scarcity of resources.
- There are various reasons why the demand for health services continues to exceed supply :
 - An ageing population in which the elderly potentially require more health services than younger adults
 - New health technologies which mean more conditions have become treatable
 - Increased expectations from people

Why Health Economics ?

- A knowledge of the applications of economics to the administration of public health :
 - Enables health planners to hold their own in discussions with other planners
 - Helps those responsible for the management of national resources being devoted to health services to meet the growing demand
 - Helps them to provide an explanation of the increasing per capita expenditure and spiralling costs of health services

- Helps them to ensure that the consumers obtain value for money
- Helps to limit the freedom of providers of care and the international pharmaceutical industry to pursue their own exclusive interests
- Can bring to the health planning process a number of specialized techniques which can give greater objectivity in the consideration of rival claims for priority.





The building blocks of economics

I have sometimes suggested when teaching health economics that if any of the participants fall asleep during my lecture and awaken conscious that I have asked a question but that it has gone unheard, then the best response is to mutter something about opportunity cost and the margin. This has something like a 50 per cent or higher chance of being at least partly right.

(Mooney 1994: 27)

The building blocks of economics

1. **Scarcity**
2. **Choice and opportunity cost**
3. **The margin**
4. **Efficiency and equity**

Economic evaluation



- It is important to determine at the outset from whose viewpoint an economic evaluation is to be carried out.
- The broadest viewpoint is that of society in general, as this will include all the costs and benefits, no matter to whom they accrue.
- For this reason, it is the preferred approach.

Inputs and Outputs

INPUTS – These are the resources consumed and can be divided into three types :

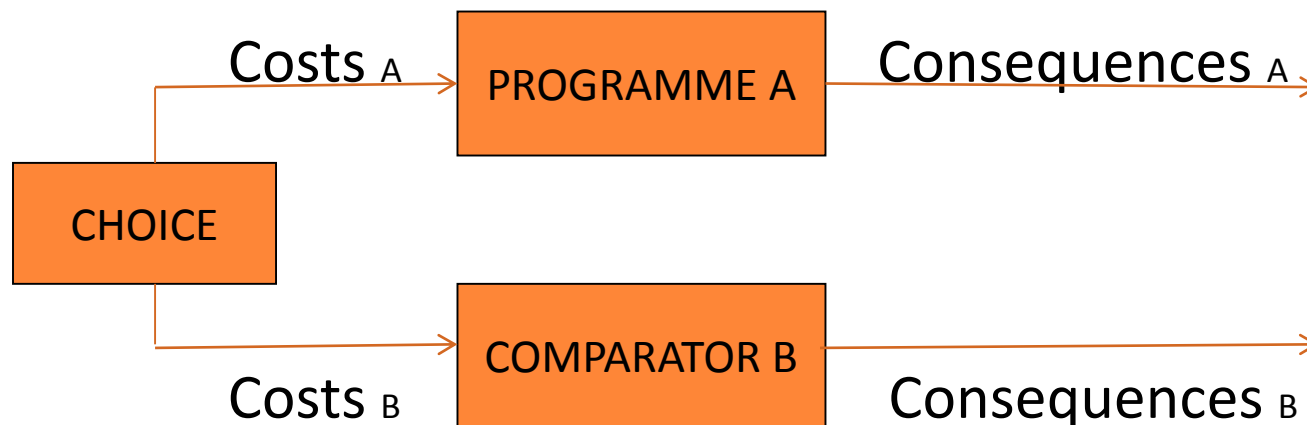
- Direct costs
- Indirect costs
- Intangible costs

OUTPUTS – These are the resulted changes in health and are of three types :

- Natural units
- Utility measures
- Monetary units



- The weighing up of costs and benefits is then used to help health care decision-makers make informed choices about interventions that will give the best outcomes.
- To make comparisons -
 1. Identify whether there are two alternatives that can be compared
 2. Which of the two interventions will give the best outcome?



Features that characterize an Economic Evaluation –

- It is the linkage of costs and consequences, which allows us to reach our decision.
- Economic analysis concerns itself with choices.
- Always compares any health care programme with an alternative, for example, no treatment or routine care.
- Always measures the benefits produced by all alternatives compared.
- Always measures the cost of any programme.

- Therefore, the basic tasks of any economic evaluation are to –
 - Identify
 - Measure
 - Value
 - Compare the costs and consequences of the alternatives being considered.
- Economic evaluation of health care programmes aims to aid decision-making with their difficult choices in allocating health care resources, setting priorities and moulding health policy.

- The real purpose of doing economic evaluation is to improve efficiency, the way inputs can be converted into outputs.
- Drummond et al (1997) defines economic evaluation as “the comparative analysis of alternative courses of action in terms of both their costs and consequences.”



Types of economic analysis

- The different ways of looking at benefits combined with cost analysis represent the different techniques of economic evaluation:
 - 1) Cost effectiveness analysis
 - 2) Cost minimization analysis
 - 3) Cost utility analysis
 - 4) Cost benefit analysis



1) Cost effectiveness analysis

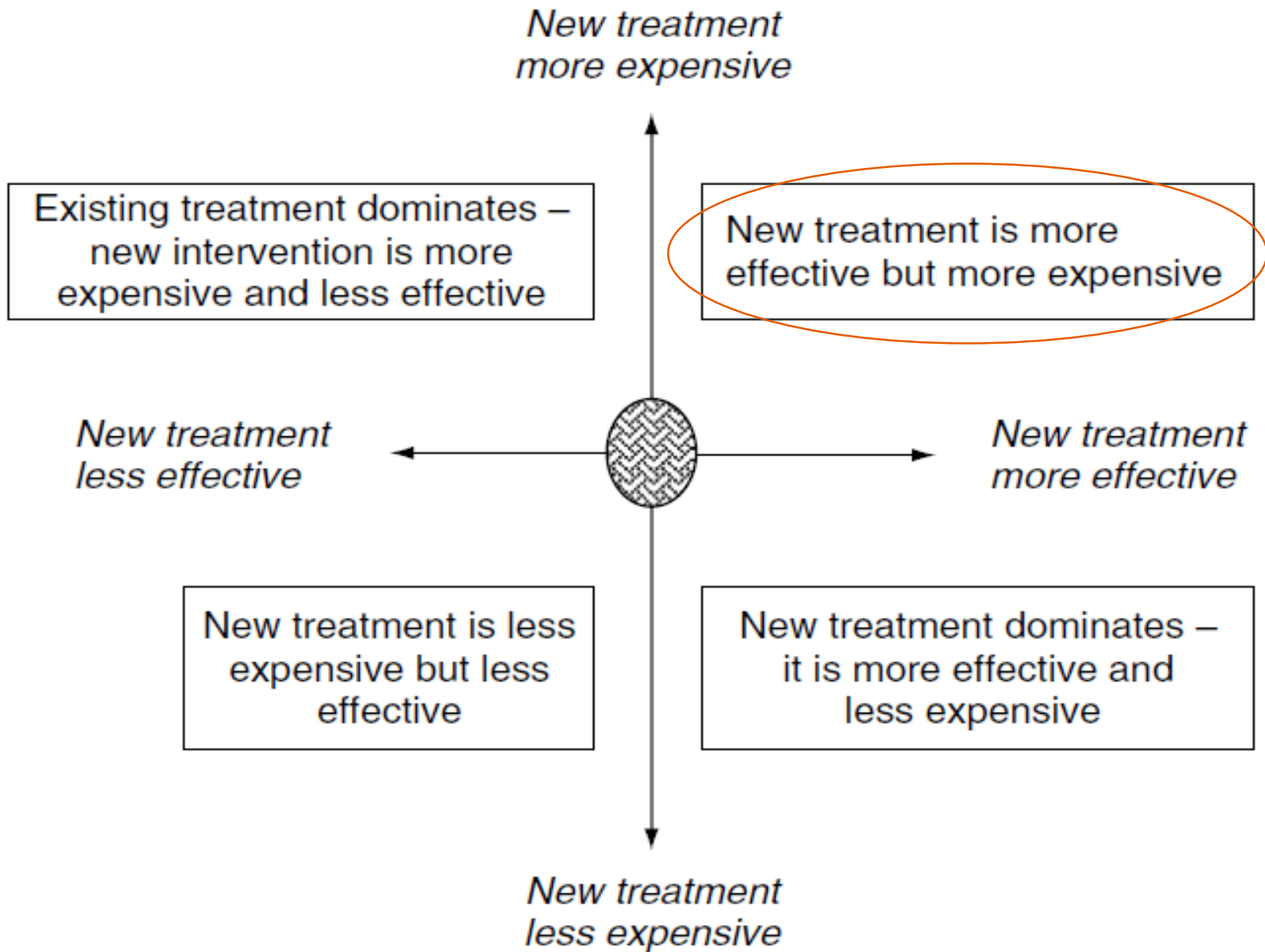
- It is used to compare health care technologies that have different outcomes, but common one-dimensional health benefits and which are measured in the same natural units.

Examples of measures of effectiveness

- Cases treated appropriately
- Lives saved
- Life years gained
- Pain or symptom free days
- Cases successfully diagnosed
- Complications avoided



- CEA is concerned with technical efficiency issues, such as, what is the best way of achieving a given goal or what is the best way of spending a given budget.
- Comparisons can be made between different health programmes in terms of their cost effectiveness ratios, like cost per unit of effect.
- Incremental cost-effectiveness =
$$\frac{(\text{cost of B} - \text{cost of A})}{(\text{benefits of B} - \text{benefits of A})}$$



2) Cost minimization analysis

- The benefits of two or more health care technologies being compared are assumed to be equivalent.
- The analysis, therefore, focuses on cost side of the equation to identify the least costly option.
- It is concerned only with technical efficiency.
- It can be regarded as a narrow form of cost effectiveness analysis.
- But these analyses are rare as the outcomes between programmes are rarely identical.

Advantages

- Simple to carry out, requires only costs to be measured
- Avoids needlessly quantifying data

Disadvantages

- Can only be used in narrow range of situations
- Requires outcomes to be equivalent



3) Cost utility analysis

- CUA is concerned with technical efficiency and allocative efficiency.
- CUA tends to be used when quality of life is an important factor involved in the health programmes being evaluated.
- This is because CUA combines life years (quantity of life) gained as a result of a health programme with some judgment on the quality of those life years.
- Utility is simply a measure of preference, where values can be assigned to different states of health that represent individual preferences.
- This is normally done by assigning values between 1.0 and 0.0

- Conventional CUA uses QALY concept and therefore, the results are reported in terms of cost per QALY gained.
- QALYs combine life years gained with a measure of the quality of those years.
- $\text{QALYs} = \text{estimated survival} \times \text{estimated QALY weight}$
- $\text{Cu ratio} = \frac{\text{cost A} - \text{cost B}}{\text{QALY A} - \text{QALY B}}$



- The advantage of the QALY as a measure of health outcome is that it can simultaneously capture gains from reduced morbidity (quality gains) and reduced mortality (quantity gains), and combine these into a single measure.
- Rival measures such as healthy years equivalents (HYEs) and saved young life equivalents (SAVEs) have also been put forward.



4) Cost benefit analysis

- Cost-Benefit analysis (CBA) estimates and totals up the equivalent money value of the benefits and costs to the community of projects to establish whether they are worthwhile.
- The main difference between cost-benefit analysis and other methods of economic evaluation is that it seeks to place monetary values on both the inputs and outcomes of health care.

Economic Evaluation – Dealing with Uncertainty and Time

Sensitivity Analysis –

- In economic evaluation, some form of sensitivity analysis is frequently carried out in order to allow for uncertainty.
- Uncertainty may be present in the evaluation for several reasons :
 - If data are unavailable and assumptions are necessary
 - If data are available but are known to be inaccurate
 - If there exists methodological controversy around the derivation of values

Discounting –

- It is used in economic evaluation to reflect the fact that individuals prefer to have resources now rather than later.
- It incorporates discounting to express future costs and benefits in terms of their Net Present Value (NPV).
- $NPV = [(B_t - C_t) / (1+r) - 1]$



The Scope of Health Economics

- A useful schematic structure of health economics was first drawn up by Williams (1987).
- It shows the principal topics in the field and the intellectual links between them.
- The four central boxes, A, B, C and D, are the disciplinary “engine room” of health economics, while the four peripheral boxes E, F, G and H are the main empirical fields of application for whose sake the “engine room” exists.

F. MICROECONOMIC APPRAISAL

Cost-effectiveness, Cost-benefit, and Cost-utility analysis of alternative ways of delivering care (e.g., mode, place, timing, or amount) at all phases (detection, diagnosis, treatment, after-care, etc.).

E. MARKET ANALYSIS

Money prices; time prices; waiting lists and non-price rationing systems as equilibrating mechanisms and their differential effects in markets for physician and hospital services.

B. WHAT INFLUENCES HEALTH (OTHER THAN HEALTH CARE)?

Genetics; occupational hazards; consumption patterns; education; income; capital (human and physical); family background, etc.

A. WHAT IS HEALTH? WHAT IS ITS VALUE?

Perceived attributes of health; health status indices; value of life; utility scaling of health.

C. DEMAND FOR HEALTH CARE

Influences of A and B on health care seeking behavior; barriers to careseeking (price; time, psychological; formal); agency relationship; need; altruism; insurance; demand for and effects of demand for care.

D. SUPPLY OF HEALTH CARE

Costs of production; alternative production techniques; input substitution; markets for inputs (manpower; equipment; drugs; etc.); remuneration methods and incentives; for-profit and non-profit organizations; HMOs; etc.

G. PLANNING, BUDGETING, REGULATION, AND MONITORING MECHANISMS

Evaluation of effectiveness of instruments available for optimizing the system; interplay of budgeting, manpower allocations, regulation, and the incentive structures they generate.

H. EVALUATION AT THE WHOLE SYSTEM LEVEL

Equity and allocative efficiency criteria brought to bear on E and F; inter-regional and international comparisons of performance; financing methods.

A. What is Health ? What is its value ?

- It contains a multi-disciplinary literature in which one finds economists, epidemiologists, operational researchers, psychologists and sociologists all working, and sometimes even working together.
- The central issues here relate to the meaning of “health”, its relationship with “welfare”, and the development of valid and reliable measures of it for a variety of purposes, specific and general.



B. What influences Health (other than health care) ?

- It is concerned with the determinants of health, broadly genetic and environmental.
- It concerns the interaction between a health production function and a health demand function and has been a highly distinctive research area within health economics.

C. Demand for Healthcare

- This demand is a derived demand (from the demand for health) and comes logically after boxes A and B.
- This is also where utility interdependencies come in (externalities), where the tensions between “need” and “demand” are addressed, and where important questions related to the normative significance of revealed demand have been extensively discussed.



D. Supply of Healthcare

- It contains the material to be expected in supply-side economics like hospital production functions, input substitutions, behavioural relations, labour markets, the responses of institutions and health industry workers to changes in their environments and modes of payment, industrial regulation.
- The health care industry encompasses not only the more obvious health care organisations like hospitals, HMOs, and general practices, and the again obvious medical supplies sector, but also other public and private caring agencies, often dealing with specific client groups, and often doing so on a community basis.

E. Market Analysis

- It deals with the ways in which markets in all these sectors operate and is a major chunk of applied health economics, especially in countries where there is substantial dependence on market institutions for the provision of health care insurance and the delivery of health care.
- Even where there are no formal markets, the health care system operates as a kind of quasi-market.
- Queuing and waiting lists/times for admission to hospital are considered in this box.
- The material of this box is “positive” as well as “normative”, evaluating the performance of markets using the tools of welfare economics.

F. Microeconomic Appraisal

- It is more specifically evaluative and normative.
- It is the home of applied cost effectiveness and cost-utility analysis.



G. Planning, Budgeting, Regulation and Monitoring mechanisms

- It is primarily American in its content, doubtless largely because of the great variety of health care delivery institution, insurance and reimbursement mechanisms, and the various roles played by federal and state agencies.
- The evolution of new forms of organisation, financing and monitoring/control has flourished apace in the US.

H. Evaluation at the Whole System Level

- It is concerned with the highest level of evaluation and appraisal across systems and countries.
- The internationally observed differences between the mechanisms, expenditure rates, objectives and outcomes are phenomena needing explanation but they also raise difficult questions of how best to make comparisons and for what purpose and how best to infer “lessons” from one system for another.



Health Economics in Dentistry



- One of the major problems in dentistry is taking the results of a clinical trial and trying to turn that into a lifetime benefit from an intervention.
- Published economic evaluations of caries preventive programmes usually include summary cost effectiveness ratios.
- However, even when comparing studies that consider the same objective, by the same technology, using the same delivery system, differences in cost effectiveness ratios can occur.

- There are a number of reasons why such direct comparisons are not helpful if they are taken out of context :
 - Relevant costs and benefits to patients may or may not be included in the analysis.
 - Intangible costs such as anxiety in relation to dental treatment may or may not be included.
 - Discount rates and adjustments for inflation used may vary.
 - The time when the study was undertaken may influence the cost effectiveness ratio.



Conclusion

- The purpose of studying economics for a health care personnel is to enable him/her to understand and apply the knowledge of economics to their subject.
- Health economics represents a valuable tool for improving the information base upon which healthcare decisions are made.
- Health economics cannot provide a complete answer as to which intervention to use, but it can provide a systematic intellectual framework from which informed choices can be made.

- It is important for dentists to recognise that health economics is still in its infancy and is developing as a speciality in its own right.
- The quality of its science can only be refined by application, and as the science improves, so too will the value of health economic analyses to those responsible for allocating resources within the field of dental care, will improve.



