ECONOMIC EVALUATION IN HEALTH CARE
Outline of the Session

1. What is Economic Evaluation?
2. Why do Economic Evaluation?
3. What is Costing useful for?
4. Types of Economic Evaluation (EE) approaches
   a) Cost- Minimization Analysis
   b) Cost- Effectiveness Analysis
   c) Cost- Benefit Analysis
   d) Cost- Utility Analysis
5. Some Outcome Measures
6. Other issues (uncertainty, limitations of EE)
7. How you will make use of EE information
What is Economic Evaluation?

Definition:

“...the comparative analysis of alternative courses of action in terms of both their cost and consequences.”

Drummond, M. F. et al. 1997

It involves gathering and examining data about choices (interventions/programs) so they can be assessed.
Why do Economic Evaluation?

- Improve strategies, programs, and interventions so you get the best value for your money and effort
- Make more informed decisions in future planning
- Clarify the options available
- Account for the expenditure of funds
What Is Economics?

- **Economics** is the study of the *choices* made by people who are faced with scarcity *or* choosing how to use *scarce resources* that have *alternative uses*. 
Economic Cost

- In economics, the notion of a firm’s costs is based on the notion of economic cost.
- The key principle underlying the computation of economic cost is the principle of opportunity cost.

**PRINCIPLE of Opportunity Cost**

The opportunity cost of something is what you sacrifice to get it. If you use a resource (money, staff) for Good A (Vaccination) you may not be able to use it for Good B (HIV/AIDS)
Why Do Economic Evaluation?

• To assist in **choosing** between options – “An aid to decision-making, not a substitute for thought”
  
  – E.g. comparing different HIV prevention programs in terms of their cost and their effectiveness in preventing new HIV cases – cost per HIV-case prevented
  
  – E.g. comparing different HIV treatment programs in terms of their effectiveness in extending life and their cost – cost per Life Year Gained
What is costing useful for?

• Determining the resource requirements of an intervention
• Identifying costs and potential savings – e.g. the optimal use of personnel in health care delivery
• Budgeting & Strategic Planning
• Assessing efficiency in two “equivalent” programs
  – Which one yields the greatest benefit with a given amount of resources
Types of Economic Evaluation

• Four main techniques:
  – Cost-minimization analysis
  – Cost-benefit analysis
  – Cost-effectiveness analysis
  – Cost-utility analysis

• All attempt to compare the inputs with the outputs
• All use similar costing methods to estimate the inputs
• Main distinction = way in which outcomes (benefits) are evaluated
• Each has advantages and disadvantages – selection depends on the question you are asking and the alternatives you are comparing
Accounting Versus Economic Cost

• An accountant’s notion of costs involves only the patient’s explicit costs.
  – *Explicit cost*: the patient’s actual cash payments for its inputs.

• An economist includes the patient’s implicit costs.
  – *Implicit cost*: the opportunity cost of non-purchased inputs.

• *Economic cost*: the sum of explicit cost plus implicit cost.
Types of Costs

1. **Direct Costs**: all the cost incurred in delivering the health service (i.e. hospitalization)

2. **Direct Non-medical costs**: (i.e., transport, lodging at the site)

3. **Indirect costs**: those additional costs, usually from the perspective of the patient, in accessing the health service (lost productivity)

4. **Intangible Costs**: those difficult to identify and measure eg. illness, depression, loss of quality of life (pain and suffering)
Cost-minimization analysis (CMA)

- Outcomes between two or more alternatives are identical (e.g. exactly the same number of life-years gained)
- Thus the evaluation aims to identify the least costly (cheapest) intervention
- Only addresses **technical efficiency** & costs of inputs. Technical efficiency is a term used by economist to mean that “resources are not wasted in the production process.”
- CMA is limited in use because it is not common for the outputs to be exactly the same
Cost-effectiveness analysis (CEA) • Probably the *most used* approach. When the outcomes of the different interventions are different but can be measured in the *same terms (natural units)* then the inputs are costed. For example:

- CEA of different interventions for averting heart attacks
- CEA of different ARV regimens for HIV+ adults

• Competing interventions are compared in terms of cost per unit of consequence e.g. cost per patient with and without heart attack.

• The measures of outcome have to be common to all alternatives to allow comparison.
Cost-benefit analysis (CBA)

- Measures all costs and benefits in dollar terms
- You can compare any program with any other program
- Costs and benefits (effects) of an intervention are both valued in monetary terms ($$$) e.g. CBA can give information on whether a health intervention should be funded based on societal gains, in comparison to other health programs – e.g. mass vaccination program for measles.
- CBA allows comparison of programs between health care and other sectors (allocative efficiency). If the benefits of implementing the intervention are greater than the costs, then the program should be funded.
- CBAs are used infrequently in health care because it is difficult of expressing health benefits directly in monetary units
Cost-utility analysis (CUA)

• Lies between CEA and CBA – assesses technical efficiency (*doing it right*) as well as *allocative efficiency* (*Obtaining the most consumer satisfaction from available resources. Resources are allocated in such a way that consumer satisfaction is at its highest possible level.*) but only within the health care sector

• Benefits expressed in terms of a multi-dimensional unit of outcome (e.g. QALYs or DALYs etc). This measure of outcome combines values of mortality and morbidity with values based on preferences of patients and related individuals regarding health states.

• Interventions are compared in terms of cost per unit of utility gained
Some outcome measures

• The consequences/results of an intervention. It can be a specific outcome of the intervention but refers to an overall *Health Improvement*...

• There are various non-mutually exclusive classifications of outcomes:
  – Direct, Indirect and Intangible
  – Final and intermediate outcomes
  – Natural/physical units and utility/generic units

Some examples
Deaths averted
Condom use increase
Malaria cases prevented
Fully Immunized Children
QALYs gained
DALYs averted
Life years gained
Reduction of pain
Levels of cholesterol reduced
HIV cases avoided
Increase in productivity at work
Number of VCT sites per 10,000 population
Healthy Years Equivalent
• In costing we identify and measure all the inputs and all the outputs or benefits of the cost.
• Some examples:
  – HIV treatment programmes: cost per life year gained
  – HIV prevention programmes: cost per HIV case prevented
  – Immunisations: cost per Fully Immunised Child (FIC)
  – Immunisations: cost per measles case prevented/death prevented
  – Malaria ACT treatment: cost per cured case
Simplified criteria to guide decision-making for cost-effectiveness

1. Alternative is less costly and less effective
2. Alternative is less costly and more effective (this strategy dominates)
3. Alternative is more costly but less effective (this strategy is dominated)
4. It is more costly but also more effective; if the extra cost is worth the extra benefit then choose this alternative
Every point in this box is dominated by point A

More effective, more expensive

Less effective, less expensive

Every point in this box is dominated by point A

Increasing effectiveness

Increasing cost
Summary

• Economic Evaluation is a useful tool for resource allocation

• Accounting for uncertainty
  – Sometimes we cannot be certain about some aspects of the economic evaluation, especially future costs (e.g. inflation rate) and benefits
  – Sensitivity analysis: use a range of estimates based on different assumptions to assess if changes in the value of a variable will affect the results of the analysis for both costs and effects

• In some cases cost-effectiveness/utility criteria needs to be complemented by other important considerations: ethics, equity, etc.
Key messages

• Economic evaluation is “an aid or tool to decision-making, not a substitute for thought”
• Select type of economic evaluation based on the question to be addressed
• Always remember and account for uncertainty in the results


• Miller, Paul (2001) Health Economic Evaluation, Trent Focus for Research and Development in Primary Health Care. Available at:  