HEALTH ECONOMICS EVALUATION IN HEALTH PLANNING

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ABSTRACT

Health economics is the application of economic theory, models and empirical techniques to the analysis of decision-making by individuals, health care providers and governments with respect to health and health care. Application of health economics is used to varying degrees in the health systems. The widespread its use is, and the purposes for which it is used, depend to a great extent on the country’s dominant health system, whether public, social insurance or private insurance based. Health planning doesn't always get the attention that it deserves; when it does, many planners discover that the planning process isn't as easy as they thought, it would be or that even the best-laid plans can go wrong. This is the reason that health economics evaluation becomes important and a major tool to ensure excellent planning process in health care. In healthcare, most commonly used methods of health economic evaluations are; cost minimization analysis, cost-effectiveness analysis, cost-utility analysis and cost-benefit analysis. Health economics evaluation is exerting an influence on planning decision making at all levels of health care. It seeks to facilitate decision making plan by offering an explicit decision making plan framework based on the principle of efficiency. But health economics evaluation is not the only consideration to be taken in decision making or health planning. Health economics evaluation is not mean to replace other tools in health planning, but it is an important one and health planners will need to have an understanding of its basic principles and how it can impact on decision making and planning.

Keywords: Health Economics, Evaluation, Health Planning
1.0 Introduction

Application of health economy is used to varying degrees in the health systems of different countries and different settings. The widespread its use is, and the purposes for which it is used, depend to a great extent on the country’s dominant health system, whether public, social insurance or private insurance based. In developing countries, this also depends on the extent to which the country is in receipt of aid from international bodies and the priority placed on evidence based decision making (Parkin, 2011).

However, to achieve all the health care decisions, there has to be a planning process as part of the larger managerial responsibility. Of the five management functions namely; planning, organizing, staffing, leading and controlling; planning is the most fundamental. All other functions stem from planning. However, planning doesn't always get the attention that it deserves; when it does, many managers discover that the planning process isn't as easy as they thought it would be or that even the best-laid plans can go wrong. This is the reason health economics becomes important and a major tool to ensure excellent planning process in health care. Health economics evaluation is a powerful tool in planning, it is not the only ingredient require in planning and prioritizing of health programs or project. This is because other criteria like population needs, political preferences, policy direction, other epidemiological and research evidences and resources availability are usually required for excellent planning outcome.

From a public health point of view, health economics is just one of many disciplines that may be used to analyze issues of health and health care, in particular as one of the set of analytical methods labelled as health services research. But from an economics point of view, health economics is one of many topics to which economic principles and methods can be applied to health and health care. So, in describing the principles of health economics, one is really setting out the principles of economics and how they might be interpreted in the context of health and health care. Therefore, health economics is the application of economic theory, models and empirical techniques to the analysis of decision-making by individuals, health care providers and governments with respect to health and health care (Morris et al, 2007). A more comprehensive definition is that health economics isa branch of economics concerned with issues related to efficiency, effectiveness, value and behaviour in the production and consumption of health and health care (Glied and Smith, 2013). In broad terms, health economics can be defined as the application of the theories, concepts and techniques of economics to the health sector. These basic principles of economics hypothesise that there are scares resources and then the need to rationalise the resources by prioritising the need of the health organization or the sector.

The aims of health economics are to obtain maximum value for money. To achieve this requires health services to be evaluated. Health economics evaluation which involves the explicit measurement of inputs or costs or outcomes or benefits is use tool in evaluating health services. The principle of health economics looks at the basic demand and supply of health and how the manager can use such knowledge to make most appropriate decision to improve productivity and quality of services at the cheapest alternative. In healthcare the most commonly used methods of health economic evaluations are; cost-minimization analysis (CMA), cost-effectiveness analysis (CEA), cost-benefit analysis (CBA) and cost-utility analysis (CUA)(Morris, 2007; Parkin, 2011). Other than evaluating health care or health services, health economics also focuses on the markets for health and health care; the way in
which health and health care are produced, and the determinants of how much individual consume health or health care (Haycox, 2009).

Planning is a process of deciding how the future should be different from the present, what changes are necessary, and how these changes should be brought about. It involves setting goals, developing strategies, and outlining tasks and schedules to accomplish the goals. In health planning, the organization is deciding in advance what to do, how to do and who is to do it, and the outcomes of the activities. There health planning aims is to bridges the gap between where the health systems are and where we want to go. It makes possible things to occur which would not otherwise occur. Health planning is an orderly process of; defining health problems, identifying unmet needs and surveying resources to meet them, establishing priority goals, that are realistic and feasible and projecting administrative action to accomplish the purpose of proposed programs. The planning process is a continuous cycle of activities which encompasses elements that are sequential in nature as shown Figure 1.

![Planning Cycle](https://eclkc.ohs.acf.hhs.gov/.../planning-cycle-presentation-trainers.ppt)

**Figure 1**: Planning Cycle

*Source: Qotba Hamda. Available at: [https://eclkc.ohs.acf.hhs.gov/.../planning-cycle-presentation-trainers.ppt](https://eclkc.ohs.acf.hhs.gov/.../planning-cycle-presentation-trainers.ppt)*

The process of planning can take on three main types in a hierarchical order as Figure2. The Operational planning is the first line of management planning, with tactical planning at the mid-level management. The strategic planning is the topmost and highest hierarchical of health planning.
2.0 Health economics analysis in health planning

Though the role of health economic application will differ from organization to organization, settings to settings and from country to country (Brenzel, 1993). However the applications of different designs of health economic evaluation will provide specific but at times overlapping role in planning. These are discussed below;

2.1 The role of cost effectiveness analysis in health planning

The main importance of conducting a cost-effectiveness analysis of health an interventions is because cost-effectiveness analysis integrates a wide body of information into a single measure, requiring collaboration and participation of different disciplines, such as public health, epidemiology, economics, and medicine (Brenzel, 1993; Kernick, 2003). As a single measure, cost-effectiveness ratios can be used to guide information needs for ongoing program management and the planning process, as well as stimulate research on the underlying causes and risk factors for the burden of disease and on the cost of providing health interventions through alternative strategies (Brenzel, 1993).

More importantly, cost-effectiveness analysis provides an alternative to ad hoc and subjective health planning based on historical trends or political preferences. The analysis helps to circumscribe the policy debate by introducing quantitative information (Brenzel, 1993). Because CEA provides a common terminology for health planners, health professionals and other officials, this methodology can be used to justify support for health priorities and
programs, or to reject possible options because they do not represent an efficient use of resources.

Unlike most planning processes, assumptions regarding both the costs and outcomes of health interventions are made explicit during the analysis, which helps to restrict the arbitrariness of choices made by policy makers who often rely on implicit assumptions and preferences (Brenzel, 1993). As a consequence, modifications in health budgets and priorities can be based on changes in the quantity, quality, or timing of inputs rather than on subjective opinions and impressions. While demanding in terms of data requirements and analysis, the CEA techniques will provide a much-needed and more methodical approach for assessing the relative worthiness of health interventions before embarking on such project. The end result will be better investment in cost-effective health services which are affordable to the governments and which address the needs of the population.

**Figure 3: Cost-Effectiveness Analysis in Health Planning**

### 2.2 The role of cost benefit analysis on planning

A cost-benefit analysis (CBA) in health care is an assessment of the costs associated with a given medical treatment contrasted with the benefits for the patient or society at large (Donaldson, 1998). 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. It has been shown to be helpful and necessary in setting priorities when choices must be made in the face of limited resources. This makes CBA an important health economic tool in planning of health program and prioritising decision during health planning stage. This is because it can provide ready-made scientific evidence on the degree of access to, or benefits of health care to be provided (Gerard & Mooney, 1993).
The basic principle of CBA is to compare costs and benefits of an intervention in which all the costs and benefits are standardized or valued in monetary terms (Gerard & Mooney, 1993; Donaldson, 1998; Kielhorn et al, 2000). The CBA will provide a list of all costs and benefits over time (CBA can have different time lines and different amounts at different times (Samuelson, 1948; Gravelle & Rees, 1992; Gerard & Mooney, 1993; Donaldson, 1998; Kielhorn et al, 2000). The type of information provided by CBA will be useful for planners to project into the behaviour of the cost and benefit of the health services or products over period of time (Samuelson, 1948; Eyles et al, 1991; Gravelle & Rees, 1992; Mooney, 1992; Gerard & Mooney, 1993; Donaldson, 1998; Kielhorn et al, 2000). In addition CBA will provide a single value of data in the form of Net Benefits (Benefits – Costs) or Cost Benefit Ratio (Benefit/Cost). This single value will inform and advice the planner (Samuelson, 1948; Eyles et al, 1991; Gravelle & Rees, 1992; Mooney, 1992; Kielhorn et al, 2000) to;

- decide whether to implement specific programs; i.e if NB > 0
- choosing among competing options; i.e if program with highest NB
- setting priorities on options given resource constraints

Furthermore the principle of Cost-of-Illness (COI) approaches such as man hour loss, employment loss, function loss, treatment cost, medication etc and Willingness-to-Pay (WTP) or Contingent-valuation surveys (e.g., how much is society willing to pay to reduce the annual morbidity and mortality risk associated with a disease or injury) has been used extensively in planning health insurance program (Samuelson, 1948; Gravelle & Rees, 1992; Mooney, 1992; Kielhorn et al, 2000), such as in setting premium at the beginning of such social health insurance, in planning the scope and coverage of insurance schemes, and in planning for scaling-up of public health programs and insurance.

A hypothetical example is stated below using a Government X Minister of Health agenda;

When he assumed office announced that the preventive health and public awareness of health issues as priorities. He would achieve the objectives by maximizing the total net social benefits received from each and every strategy available in the Country.

For medical services, the Minister faces the following objective:

\[
\text{Max TNSB} \ (Q) = \text{TSB} \ (Q) - \text{TSC} \ (Q)
\]

Where,

- \( Q \) identifies the decision variable- how many medical services to produce – and
- TSB and TSC reflect the total social benefit and total social cost associated with consuming and producing medical services, respectively. Total net social benefit (TNSB) represents the difference between the TSB and TSC.

Total social benefit (TSB) can be treated as the money value of the satisfaction generated from consuming different amounts of medical services. TSB increases at a decreasing rate reflecting the law of diminishing marginal utility.

Total social cost (TSC) can be treated as the money value of all the resources used in the producing the different amount of medical services. TSC will increases at an increasing rate indicating the law of diminishing marginal productivity.
From Figure 4 above,

Marginal social benefit;

\[(MSB) = \Delta\text{TSB}/\Delta Q \text{ or slope of TSB curve}\]

Marginal social cost;

\[(MSC) = \Delta\text{TSC}/\Delta Q \text{ or slope of TSC curve}\]

Based on geometric principle; the distance between two curves is maximized when slopes are equal.

In Figure 5 below, shows that;

\[\text{NMSB}(Q) = \text{MSB}(Q) - \text{MSC}(Q) = 0\]

If \(\text{NMSB}(Q) > 0\) ~ to produce more.

If \(\text{NMSB}(Q) < 0\) ~ to produce less

The Minister’s agenda can be restated as setting the net marginal social benefit (NMSB) of each and every preventive strategies equal to zero when planning for the health program and activities in the country.
2.3 The role of cost utility analysis in planning

In health economics the purpose of cost utility analysis (CUA) is to estimate the ratio between the cost of a health-related intervention and the benefit it produces in terms of utility unit, such as the number of years lived in full health by the beneficiaries (QALYs, DALYs etc). Hence it can be considered a special case of cost-effectiveness analysis and the two terms are often used interchangeably (Gerard & Mooney, 1993; Kielhorn & Schulenburg, 2000; McCabe, 2009). It is therefore useful to planner exactly like a CEA though with a less accurate validity. Many researchers argued that QALYs and DALYs are too subjective and prone to higher error margins thereby limiting its usage in policy makers planning process.

The primary outcome of a cost–utility analysis is the cost per utility unit, such as cost per QALY, or incremental cost-effectiveness ratio (ICER), which is calculated as the difference in the expected cost of two interventions, divided by the difference in the expected utilities produced by the two interventions (McCabe, 2009). The results of cost–utility analysis are compared with a threshold ICER; interventions with an ICER below this threshold are funded, whereas those with an ICER above the threshold tend not (McCabe, 2009). These help the decision maker to make adequate planning choice. In the real sense, CUA was developed to help decision-makers compare the value of alternative interventions that have very different health benefits, and it facilitates these comparisons without recourse to placing monetary values on different health states. CUA specifies what value is attached to specific health
states, and thus increasingly facilitates the transparency of resource allocation in planning processes.

2.4 The role of cost minimization analysis in planning

Cost-minimization analysis (CMA) measures and compares costs input, and assume outcomes to be equivalent (Kielhorn & Schulenburg, 2000; Petitti, 2000). Thus, its uses are limited in planning of health programs. However, the strength of each CMA lies on the acceptability by the decision maker or health manager that outcomes are indeed equivalent (Petitti, 2000). It has been used extensively used in clinical medicine to reduce the cost of treatment or intervention in clinical trials.

3.0 Limitation of economic evaluation in health planning

The usefulness of health economics evaluation findings may be limited by aspects of the methods of health economic evaluation. One issue is the various methods for measuring costs and benefits. The lack of one standardized method of measurement may limit the comparability of studies. Significant progress in this area has recently been made with the publication of several books that provide guidelines for conducting health economics evaluations in health care (Drummond et al, 2005; Petitti, 2000), public health programs (Haddix et al, 2003), and HIV prevention (Holtgrave, 1998). Another issue is the highly variable quality of published health economics evaluation studies. Such variation in quality was apparent in assessing economic evidence associated with most of the interventions for planning in health programs. Specific economics measures also raise concerns about appropriateness of interpretations of the results of health economics studies.

Many researchers also question the appropriateness of different types of health-related quality-of-life measures that are used in CUA (Dowie, 2002; Feeny, 2002). Some measures are based on general improvements in health, and others are based on disease-specific health improvements. Such differences can make it impractical to compare one QALY with another. Therefore, prior to making comparisons between prevention strategies targeting different diseases or health problems, the decision maker should be aware of the methodology used to derive the QALYs.

A challenge in the greater use of health economics evaluation to support planning decisions is the continued debate about what represents good economics value (Tengs et al, 1995; Stone et al, 2000). Differences in study perspective and methodology can greatly affect study results. Therefore, a judgment about the relative economics value of an intervention to embark upon requires the economics evaluation of other interventions by similar methods, but such evaluations are not usually available for planning purposes. In addition, health economics evaluations can present challenging to ethical issues, such as equity concerns for instance who “wins” and who “loses” in an economics evaluation? It means does a particular economics evaluation favour the concerns of the younger members of a population at the expense of the elderly (Williams, 1997). Another area of concern is that health values (preferences) are generally elicited from a small segment of a population and may not be representative of the population as a whole (Sampietro-Colom et al, 2004). Attempts are made to address these
challenges and concerns through the derivations and uses of QALYs. However, the success of these attempts may be considered as subjective.

4.0 Conclusion

Health economics evaluation is an important and a major tool to ensure excellent planning process in health care. Health economics evaluation is exerting an influence on planning decision making at all levels of health care. The most commonly used methods of health economic evaluations are; cost minimization analysis, cost-effectiveness analysis, cost-utility analysis and cost-benefit analysis. It seeks to facilitate decision making plan by offering an explicit decision making plan framework based on the principle of efficiency. But health economics evaluation is not the only consideration to be taken in decision making or health planning. Health economics evaluation is not mean to replace other tools in health planning, but it is an important one and health planners will need to have an understanding of its basic principles and how it can impact on decision making and planning.

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