HEALTH ECONOMICS EVALUATION IN HEALTH FINANCING POLICY

Hussaini Umar Zanda¹, Muhamad Hanafiah Juni²*

¹PhD Candidate (Health Services Management), Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

²Health Services Management Unit, Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

*Corresponding author: Associate Professor Dr. Muhamad Hanafiah Juni
Email: hanafiah_juni@upm.edu.my

ABSTRACT

Health economics evaluation, frequently in the form of cost-effectiveness analysis, is becoming an important tool in health financing policy. However, in the past its application has been limited to developed countries and the little applications in LMICs. If any, it is limited to small trials that have less impact on health policy. The WHO and World Bank are taking a leading role in applying and insisting on economics evaluations in designing regional and global guidelines aimed to further advance global health objectives. This review takes a look at some of the economics considerations in the form of rising cost of providing healthcare, scarcity of resources relative to demand, and the relevance of health sector in the form of its contribution to national economies. These factors coupled with the health system’s broader objective of maximizing health gains and cutting costs necessitates the use of economics evaluation. At the end, we look at the most recent efforts that use economics analysis within the broader context of health financing system, and also discuss how the methods are incorporated. We also highlighted on an application of economics evaluation that goes beyond population health to financial protection; an important principle in achieving universal health coverage (UHC). We concluded that economic evaluation is gaining more prominence in the global health arena and its application is becoming important in designing health interventions targeting LMICs.

Key words: Health economics evaluation, health financing, policy
1.0 INTRODUCTION

Countries all over the world are grappling with issue of finding efficient ways for financing their health systems to provide an effective healthcare for their citizens. Health financing and policy is an important issue in developing and sustaining a health system that responds and fulfill the health needs of population. Unlike in other sectors, financing of health system is a very complex venture that has moral, ethical, and economical considerations. Amidst global recession and limited resources, economic principles can help policy-makers make use of available resources to make a choice on services that can benefit their population as well as distribute the benefits in a fairly and efficient manner.

1.1 Health policies

Health policy is described as purposeful and deliberate actions through which efforts are made to develop and strengthen health systems in order to promote population health. Health policy actions must not only be informed by an understanding of the current dynamics of health system functioning and performance, but are also sustained, or undermined, by whether and how they find expression in the health system. Health policy formulation is a process spawning 3 policy domains including process, content and outcome (Brown et al, 2009). The policy process involves recognizing and identifying key factors that will inform decisions. The various stages of policy-making are very complex and imbued with factors that inhibit or facilitate at every stage. The first stage is that of problem identification and priority setting. The second stage is that of policy considerations of all alternatives and approaches towards solving the problem. It is at this stage that economic evaluations are deemed to be useful. (Choi et al, 2005).

1.2 Health financing

Governments and policy-makers faced with competing and important demands on their budgets need to be convinced on the importance of investing in healthcare and specifically, what to invest in. Health financing has three functions (WHO, 2000a); the raising of resources for health through various sources (tax, insurance, etc), the resource pooling so that cost is spread across populations, and allocation of same into different service delivery area for different forms of intervention. These functions are linked with other health system goals as shown in the framework below (Fig. 1). The functions of the health system are depicted on the left side comprising; financing, revenue generation, service delivery, and stewardship.

The functions are also part of WHO health system framework (WHO, 2000b). The outcome of all health systems is to improve population health but there is also need to reduce inequalities, improve responsive, and provide financial risk protection. The objectives are interlinked because financial protection is related to the concept of equity and distribution. Raising adequate fund is related to improving health, reducing inequalities and improves system responsiveness. The figure also shows that the goals are mediated by intermediary outcomes that facilitate the use of resource into the final outcomes. They include equity in utilization, quality, efficiency, and transparency and accountability. The focus of economic evaluation in health is on efficiency. Efficient system is needed to utilize available resources and move the system closer to its objectives.
2.0 HEALTH AND THE ECONOMY

Health economics is important for every country due to a number of reasons. The most important is the contribution of the health sector in the overall economy of nations as percentage of GDP (OECD, 2014). This is mediated through the share of income spent on healthcare and the number of jobs in the health economy. The health sector contributes substantially in varying percentages with average of 10% to GDPS of many nations across OECD nations. Another reason for the importance for health economics is the escalating cost of spending on health services across the countries over the years. In the OECD the total spending from 2000-2010 has increased by 4.3% per annum while public spending in the same time by 4.5% per annum. The objective of economics is to maximize human welfare or utility (Philips, 2009) thus, it is important that the allocation of resources in society is done as efficiently as possible. In economics, an efficient allocation of resources is defined as one that takes advantage of every opportunity to ensure that some individuals will be better off while not making anyone else worse off. Economists argue that in looking at whether an intervention represents an efficient use of resources, rational management decisions should be based on an informed assessment of the costs of reducing the adverse impacts on public health, as well as the benefits of reducing them (Vale et al, 2007; Hoomans et al, 2009). This requires that we place “economic” values on these elements. It is important to note that in...
addition to looking at whether an intervention represents an efficient allocation of resources, it may be equally important for the welfare of people to consider how those resources are distributed in society. Costs and benefits may not be borne equally across society.

2.1 Economic evaluation methods

Economics evaluation are set of analytical techniques and principles that are employed to systematically address questions of efficiency in a system. The analysis involves systematically comparing the relative costs and consequences of health intervention strategies. In health financing, focus of analysis may be directed towards marginal efficiency gains for an intervention (technical efficiency) or towards finding an optimal mix of intervention across health sector (Chisolm and Evans, 2007). Assessment of technical efficiency is conducted to determine whether new strategies aimed at a particular health problem is cost-effective.

At its basic application economics evaluation involves the listing of all cost and benefit implications of each alternative, as in cost-consequences analyses (McIntosh, 1999; Kroese et al, 2011). Cost-consequence analysis provide information that helps in making decision on spending to address problems in health care, especially when alternatives are expected to have outcomes that aren’t too clear. This method however, permits only value judgments without specifying a relation between the measures of outcomes. The method fails an important component of economics evaluation by failing to make explicitly incorporate the costs of alternative resource uses.

Cost-effectiveness and cost-utility analyses are used to assess alternative costs directly. Cost-utility analysis is a form of cost-effective analysis that measure health outcome in terms that are generic which allow different interventions to be compared in terms of their costs and health outcomes. Incremental cost-effectiveness ratios (ICER) are established by dividing the difference in costs of various alternatives by the resulting differences in health outcomes (Fig. 2). Again, the measure of outcomes most appropriate for ratio calculations depends, to an important extent, on the objective of decision-making and the perspective of analysis. Common metrics typically used include incremental cost per life-year gain or per quality-adjusted life-year (QALYs) or disability-adjusted life years (DALYs). Cost-effectiveness and cost-utility are analyses that concerned with maximizing health gains from an existing and limited budget.
In contrast with the two methods, cost-benefit analysis (CBA) rather than focusing on health gains, or the utility derived from alternatives (as in cost-utility analysis), enables the comparison of outcomes using a common denominator of value. Money is usually considered as a measure of value, therefore cost-benefit analysis compares monetary value derived from alternative interventions. The rationale for CBA is to find out whether the cost whether benefits of a program exceed cost of providing the intervention. A positive benefit shows that an intervention is worth doing from economics perspective. Benefit-cost ratio is used to determine the factors by which economic benefits outweigh the economic costs (Drummond et al, 2005). A clear depiction of the various economics evaluation methods is provided below (Table 1).
Table 1: Economic evaluation methods

<table>
<thead>
<tr>
<th>Form of evaluation</th>
<th>Use for decision making</th>
<th>Measurement of health effects</th>
<th>Economic summary measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost-consequences</td>
<td>Comparison of implementation strategies that have disparate outcomes</td>
<td>Any measure</td>
<td>Not applicable</td>
</tr>
<tr>
<td>analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost-effectiveness</td>
<td>Comparison of implementation strategies that produce a common outcome</td>
<td>Process measures (e.g., professional guidance adherence, patient compliance to medication) or health effects (intermediate or final), measured in natural units</td>
<td>Cost-effectiveness ratio (e.g., cost per case averged, cost per life-year saved), at patient or population level</td>
</tr>
<tr>
<td>analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost-utility</td>
<td>Comparison of implementation strategies that have morbidity and mortality outcomes</td>
<td>Final health outcomes, including health status, patient preferences, utilities</td>
<td>Cost per quality-adjusted life-year, at patient or population level</td>
</tr>
<tr>
<td>analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost-benefit</td>
<td>Comparison of implementation strategies with different units of outcome (health and nonhealth)</td>
<td>Monetary units</td>
<td>Net health benefit or net monetary benefit, at patient or population level</td>
</tr>
<tr>
<td>analysis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost analysis</td>
<td>Comparison of net cost of implementation strategies with equivalent outcomes</td>
<td>Not applicable</td>
<td>Net cost or cost of illness, at patient or population level</td>
</tr>
</tbody>
</table>


3.0 ECONOMIC EVALUATIONS AND HEALTH FINANCING

3.1 Cost-Effectiveness Analysis

CEA is concerned with the interventions that work at the least cost as such it is concerned with maximizing health during priority setting in health financing. It compares the cost of intervention and the expected health gain. Evidences from this evaluation can maximize health outcomes with the least resources using the ICER (Drummond, 1993). CEA has been used in the analysis of Malaria treatment during pregnancy in Sub-Saharan Africa (Silke et al, 2015). The authors using results from meta-analysis estimated the ICER of intermittent preventive treatment malaria during pregnancy with sulfadoxine-pyrimethamine (IPTp-SP) comparing 3 or more (SP3) doses with 2 doses (SP2). Their findings showed that at incremental cost of $7.28 per DALYs, SP3 was cost effective and was recommended to be included into an ante-natal care package.
Figure 3: Cost-effectiveness acceptability curves

Source: Silke et al. (2015)

Legends: The curves show the probability of SP3 being cost effective at any given willingness-to-pay (WTP) value for moderate low birth weight risk settings as well as for HIV-negative women only. The vertical lines indicate three WTP thresholds. BF=Burkina Faso. DALYs=disability adjusted life year. GDP=gross domestic product. ML=Mali. MW=Malawi. KE=Kenya. TZ=Tanzania. WHO=World Health Organization. ZM=Zambia. CE=cost effective.

WHO (2013) has also set out a decision rule for cost-effectiveness analysis to help guide policy development based on a country’s GDP per head. Interventions with a CER 1-3 times greater than the host country’s GDP per head are regarded as cost-effective, whereas ones with aCER lower than GDP per head are regarded as very cost-effective. This decision rule has been used in the analysis of surgical interventions. Surgical procedures have always been considered to be very expensive especially in limited resource countries and this has les to barrier in acceptability of surgery especially in comparison with other services with potentials to achieve global health objectives (Farmer and Kim, 2008). Chao et al. (2014) conducted systematic review to determine the cost-effectiveness of surgical interventionand compared it against other accepted public health interventions in low-income and middle-income (LMIC) settings. They concluded that many surgical interventions are in the range of cost-effective and very cost effective in LMIC settings. When viewed in a holistic approach, surgical interventions were also found to be cost-effective against many other public health interventions thus; the interventions can play a big role in community based health delivery services. They also showed that the ability of surgical intervention to prevent long-term disability prove that it is also valuable in global health movement.
CEA was also used to estimate the health and economics gain of introduction of HPV vaccine. The vaccine is part of the Global Vaccine Action plan rolled out by the WHO (2012) in an initiative to prevent millions of deaths by 2020 through equitable distribution of existing vaccines for people in all communities (WHO, 2012). Human papilloma virus has been identified as the chief cause of cervical cancer, which is the second most common cancer-affecting woman in the world (WHO, 2012). Marc et al. (2014) conducted a systematic study of cost-effectiveness of HPV vaccination with data from 179 countries. They estimated the effect of vaccination intervention in terms of number of deaths, number of cases and disability-adjusted life years (DALYs) prevented. Using a model they developed, Papilloma virus Rapid Interface for Modeling and Economics (PRIME), they evaluated cost-effectiveness by comparing cost per DALY averted and the GDP thresholds per head. They reported that HPV vaccination is likely to be considered a cost-effective and very cost-effective intervention in many countries especially amongst LMICs.
Figure 5: Comparison of estimated incremental cost-effectiveness ratios (ICERs) between Papilloma virus Rapid Interface for Modelling and Economics (PRIME) and published literature for HPV vaccination of young girls (A) In 26 countries with low and middle incomes examined in 17 studies and (B) in GAVI-72 countries.


Legend: The diagonal line shows perfect agreement between PRIME and original paper ICERs.
3.2 Extended Cost - Effectiveness Analysis

The boundary of economic analysis has been pushed beyond maximizing health and reducing cost but also by incorporating financial protection in economic evaluation of a health policy (Verguet et al. (2015). The approach involves analysis of benefit packages based on the quantity of financial protection provided as well as health benefits derived. The approach is called Extended cost-effectiveness analysis (ECEA). ECEA uses standard CEA outcome of cost per unit of health gain (Verguet et al., 2013). ECEA has application in three stages related to health financing policy evaluation. First, in health policies that offers insurance against financial risk (particularly those for universal coverage). Second, policies that have direct implications on private expenditure, and lastly policies that have various allocative consequences across socio economics status of population.

They employed the method in evaluating the gains and financial protection offered by the Indian government’s policy of financing TB treatment (DOTS) out of the Universal Public Finance (UPF) (Jha and Laxminarayan, 2009). India has over 2 million active infections and about 300,000 deaths from TB annually (WHO, 2012). In the study, the researchers assessed the burden of TB averted in terms of lives saved and it’s distribution across wealth quintiles. The private expenditure prevented, the cost of running the program, and the financial protection provided. The result showed that the program will save lives substantially and about 80% of which will be in the poor population. Also, in terms of private expenditure, about 40% of will be averted.

On a bigger scale the method has been used to assess the effectiveness and reduction in financial risk afforded by a public package of interventions initiated by government of Ethiopia (Verguet et al, 2015). The initiative was part of the government’s strategies to achieve universal health coverage. The interventions include services for measles vaccination, rotavirus vaccination, pneumococcal conjugate vaccination, diarrhea treatment, malaria treatment, pneumonia treatment, caesarean section surgery, tuberculosis DOTS and hypertension treatment. Their analysis focused on universal public finance where there is no out of pocket expenditure to cover for costs incurred for each of the nine interventions. They estimated the annual total number of deaths averted and the annual total protection afforded due to reduction in out of pocket expenditure associated with each intervention. The results in terms of intervention costs, health gains and financial protection vary across the nine interventions (Table 2 and Fig. 5). It was concluded that the interventions were found to be cost-effective (within range of CEA estimates) and large out of pocket expenditures have been prevented.
Table 2: Total government intervention costs, household expenditures averted, deaths averted, and poverty cases averted, for each of the nine interventions provided by universal public finance in Ethiopia.

Source: Verguet et al, 2015

Figure 6: Financial risk protection afforded (poverty cases averted) versus health gains (deaths averted), per US$100,000 spent (in 2011 US$), for interventions.

Source: Verguet et al, 2015

3.3 Cost-Benefit Analysis

Karin et al, (Karin et al, 2014) employed cost-benefit analysis to make a case for additional investments in health systems for a sustained, global and regional efforts to accelerate progress in the health-related MDGs. Using an investment framework, they argued that increased funding for coverage of reproductive, maternal, neonatal, and child health...
(RMNCH) services will result in substantial economic and social benefits. They also outline the cost of not investing in these services in terms of deaths, disability, loss of productivity and medical costs. Their evaluation involved using a range of advanced methods to estimate cost and benefit of the intervention packages addressing RMNCH. They conducted their analysis on 74 countries cutting across low-income (35 countries), middle-income (27 countries), upper-middle-income (11 countries), and high-income country (one country). They concluded that additional cost of US$5 per person annually in the 74 countries analyzed with the highest burden of maternal and child mortality would result in producing up to 9 times of return through economic and social benefits by 2035 (Fig. 7).

Figure 7: Benefits (by type) and investment costs, share of GDP (%), to 2035: high scenario relative to low scenario GDP=gross domestic product.
Source: Karin et al (2014)

4. CONCLUSION

The two important roles of health financing systems are to raise sufficient funds for health and achieve so in a way that allows people to access services without the risk of financial catastrophe. This article provides an introduction to economics evaluation methods and how they are used for evaluation and decision-making in health financing policy. Economics
evaluation has been used extensively in many aspects of healthcare but their applications have been limited by inconsistent methodologies and because an economic evaluation focuses on cost and consequences their application in a healthcare context can be controversial. This means that results of economic evaluation cannot be used to set priorities by themselves but should be introduced into the policy debate to be considered along with the impact of different policy and intervention mixes on other outcomes. The focus on economics evaluation in health financing is likely to increase, given the current pressures on healthcare budgets resulting from the global economics recession, coupled with increasing health care expenditure.

REFERENCES


(Accessed on 10 May 2015)


