Economic Evaluation of Health Care-Related
in Southeast Asian Countries: A Literature Review

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Abstract—This study concerned on an exploration regarding economic evaluation of health care-related researches in Southeast Asian countries from the published articles. Its aim was to describe the situation of economic evaluation of health care-related researches conducted in Southeast Asian countries from the published articles and explores a brief of the methodology applied in the studies. A literature search was conducted in September 2012 using the Medline electronic database with the PubMed interface. A combination of MeSH terms of ‘cost analysis’, ‘health care’, and ‘southeast asia’ was employed. Limitation was set for articles published at last 10 years in English language. Out of 306 records, 83 eligible articles were retrieved and reviewed. It was found that the studies had been conducted in eight of eleven countries in the region and one study conducted across the region. Thailand had the greatest number of publications (34), followed by Singapore (17). The number of articles regarding economic evaluation of health care-related in Southeast Asian countries increased over the time. The capacity of local researchers both in number and the role as first/correspondence author was more than of researchers from outside the country. Most of the authors were affiliated with the university and hospital. Most of studies that revealed the funding source got the funding support from international sources. The economic evaluation methods mostly used were COI and CA (65%), while there was also a consideration number of the use of CEA (13%) and CUA (17%) in the studies. From the studies reviewed, infectious diseases and chronic diseases were the most issues on economic evaluation of health care-related in Southeast Asian countries. The review give conclusion that such economic information is gaining importance in policy decision making for the particular setting in Southeast Asia country. A consideration number of studies on economic evaluation of health care-related in Southeast Asian countries gives possibility of using or adopting the economic evidences as well as the methodologies to be applied in other settings across the region.

Keywords: review; economic evaluation; healthcare-related; Southeast Asia

INTRODUCTION

Economic evaluation is the comparison of two or more alternative courses of action (interventions) in terms of both their costs and consequences. There are several types of economic evaluation distinguished by the experts in economics with the difference on how the consequences are measured. The types of economic evaluation include cost-minimization analysis, cost-benefit analysis, cost-effectiveness analysis, and cost-utility analysis [1]. Those types are called full-economic evaluation method. Another type, which is cost of illness or cost of treatment, is not a true economic evaluation, as it does not compare the costs and outcomes of interventions, therefore it is called partial-economic evaluation method [2]. The administrators should choose the method of economic evaluation to be used in their studies based on several considerations such as the objective of the study, the characteristics of interventions, and the possible outcomes measurement.

Economic evaluation is a tool to help priority setting of such programs including health interventions. Given the resource scarcity of the health sectors particularly in the low-income countries, the government of those countries should concentrate on more effectively utilizing the available resources. Economic evaluation guides policy makers wishing to maximize the benefits produced by the scarce resources available to them [3]. Each method of economic evaluation could provide the specific information presenting the best possible choice of interventions that suitable for their problem and setting.

Economic evaluation has the potential uses include the development of public reimbursement lists, price negotiation, the development of clinical practice guidelines, and communicating with prescribers. Unfortunately there are barriers to use economic evaluation, namely barriers relating to the production of economic evaluation data and decision context-related barriers. In the western/developed countries such as Canada, the UK, and The Netherland; economic evaluation has been formally accepted for use in policy decision-making. While in Asia, only a few countries currently adopt economic evaluation as a formal tool for informing health policy decisions. However, there has been impetus to justify resource allocation decisions in the health sector among the Asian countries [4-5].

This study concerned on an exploration regarding economic evaluation of health care-related researches in Southeast Asian countries from the published articles. Its aim was to describe the situation of economic evaluation of healthcare-related researches conducted in Southeast Asian countries from the published articles and explore a brief of the methodologies applied in the studies.
II. METHODS

A. Searching Method

A literature search was conducted in September 2012 using the Medline electronic database with the PubMed interface. A combination of MeSH terms of ‘cost analysis’, ‘health care’, and ‘southeast asia’ was employed. Limitation was set for articles published at last 10 years in English language. Inclusion criteria were the study of economic evaluation related to health care conducted in the settings of Southeast Asian countries or Southeast Asian region; either abstracts or full articles that can be accessed. While the searching excluded the review articles.

B. Data Extraction

The following information were obtained from each study included in the review: type of document (abstract, full article); setting of study (country or region); year of publication; health care-related category; capacity of local researcher on the studies (articles written by local authors or written by outside authors or written in collaboration of both local and outside authors, local authors as the first or correspondence author); institution on which the author is affiliated; economic evaluation method (cost analysis, cost of illness, cost-minimization analysis, cost-benefit analysis, cost-effectiveness analysis, cost-utility analysis, and budget impact analysis); design of the study based on the data collection method (retrospective, cross sectional, prospective, modeling); and availability of funding for the study as well as the source of funding.

III. RESULTS

Searching result

The literature search found 306 records, 223 of which did not meet the inclusion criteria and were therefore excluded. Eighty-three eligible articles were retrieved. Of the 83 articles retrieved, 60 articles (72%) were full texts, while 23 articles were abstracts available only. Finally, the 83 articles retrieved were reviewed.

Setting of the study

It was found that the studies had been conducted in eight of eleven countries in the region and one study was conducted across the region. Thailand had the greatest number of publications (34); followed by Singapore (17); Indonesia, Malaysia, and Vietnam (8); Cambodia (4); the Philippines (2); and Laos (1).

Number of publications over the time

The distribution of the articles over the time was shown on Figure 1. There is a fluctuation of the number of articles from the year 2003 to the year 2012, however the number of articles tended to increase over the time.

Capacity of local researcher

Among the articles, 38 articles (46%) were written by local researchers, 5 articles (6%) by outside researchers, and 40 articles (48%) in collaboration of both. Fifty-eight articles (70%) mentioned the name of a local researcher as the first or corresponding author. The total number of local authors involved in the studies is 279 authors, more than that of outside authors, which are 133 authors. The data gave conclusion that most of the studies were written by local researchers as well as the local authors had more participation in the articles as their number was bigger and they were mentioned as the first or correspondence author more frequently than the outside authors.

Affiliation of the author

The highest number of the article was written by the authors affiliated with the university, followed by the articles written by the authors affiliated with the hospital. Among all the articles, 24 articles were written solely by the authors affiliated with the university, while 42 articles were jointly written by the authors affiliated with the university and other institution such as hospital, ministry of health, research center, insurance company, and pharmaceutical company. Third ten articles were written by authors that affiliated with the hospital and 22 articles were written in collaboration of authors affiliated with hospital and other institutions. Nine ten articles were written by the authors affiliated with the government office of ministry of health in collaboration with authors from other institution. Only one article is written solely by the authors from the research center, while 18 articles were jointly written by the authors from the research center and the other institution. Only 2 articles were written by the authors from the pharmaceutical company.

Research funding sources

Among the articles, 51 articles revealed their funding sources, while 32 articles did not mention about the funding source in the article. Of the 51 articles that revealed their funding sources, most of them were supported by international non-profit organizations such as the World Health Organization (WHO), World bank/Programme of Advancement Through Health and Education (PATH),

![Figure 1. Distribution of the articles over the time](image-url)
European commission, and many others. It was accounted for 21 studies were solely supported by international non-profit organizations. Four studies were solely supported by domestic public funds, while 3 studies were jointly supported by both domestic public funds and international non-profit organizations. Eight studies were funded solely by the university as well as 2 studies were solely funded by the hospital. The pharmaceutical companies supported 7 studies in this review, while domestic non-profit organizations supported 2 studies in this review. Finally, 4 studies clearly mentioned that they did not receive any funding support from other sources.

Method of economic evaluation

Figure 2 shows the distribution of economic evaluation methods applied in the studies. Generally, economists distinguish four types of economic evaluation methods, which therefore are called full-economic evaluation method. They are cost-minimization analysis (CMA), cost-benefit analysis (CBA), cost-effectiveness analysis (CEA), and cost-utility analysis (CUA) [1]. The others mention about cost of illness (COI) or cost of treatment as well as cost analysis as part of economic evaluation method which is called partial-economic evaluation method, however this method is not a true true economic evaluation as it does not compare the costs and outcomes of interventions [2]. Another term, budget impact analysis (BIA) is an essential part of a comprehensive economic assessment of a health-care technology. The BIA is purposed to estimate the financial consequences of such program/intervention within a specific health-care setting [6].

Among the type of economic evaluation applied in the studies reviewed, partial-economic evaluation method (COI and CA) has become the predominant method of economic evaluation which accounted for 65%, while among the full-economic evaluation method solely, CUA and CEA have been used widely which accounted for 17% and 13% respectively.

![Method of economic evaluation](image_url)

**Figure 2. Distribution of economic evaluation methods applied in the studies**

Design of study

The design of economic evaluation studies in the healthcare field can employ among three essential types of methodologies, which are retrospective, prospective, and predictive. Retrospective studies based on a design that is observational and using administrative registries or reviewing clinical histories. Prospective studies combine prospectively collected clinical trial data with resource data collected retrospectively. While predictive studies can employ data from epidemiological studies, meta-analysis, community trials and expert opinions to create the models that allow projections to be made on the consequences of adopting certain health measures [7].

Among the studies reviewed, 23 studies used retrospective data, 19 studies used prospective data, 17 studies used cross sectional data, and 3 studies used both retrospective and cross sectional data. Finally, 21 studies employed modeling technique to conduct economic evaluations.

Distribution of studies by disease/intervention category

Figure 3 shows the distribution of published economic evaluations that were reviewed by the disease/intervention category. The disease categories were grouped referring to the International Classification of Diseases version 10 (ICD-10) with modification [8]. The disease categories covered by the published economic evaluations reviewed show a high share in certain categories such as infectious diseases and chronic diseases, and a low share in other categories.

Most of the studies dealt with infectious diseases (19 articles) and chronic diseases (18 articles). Infectious diseases found in the articles reviewed included respiratory tract infections (pneumonia, tuberculosis, chronic obstructive pulmonary disease (COPD)); gastrointestinal tract infections (bacterial diarrhea, rotavirus diarrhea/gastroenteritis, *Helicobacter pylori* infection); meningitis; sepsis; dengue fever; herpes-zoster infection; and communicable illnesses. Chronic diseases in the articles reviewed consisted of diabetes; asthma; zoster infection; and Parkinson’s disease.

![Disease/intervention category](image_url)

**Figure 3. Distribution of published economic evaluations by disease/intervention category**
Another infectious disease, HIV/AIDS, had a considerable number (7 studies) being an issue on economic evaluation in this review. While the rest disease categories/interventions that were cancer, eye problems, hospital services, injuries, mental disorders, and vaccination had the comparable number of studies in this review (4-6 studies each category). The others, explicit category mentioned in the group, included perinatal care, tobacco control program, overactive bladder, dental service, and medical devices usage that accounted for 9 studies.

IV. DISCUSSION

Finding from the review shows that the number of articles regarding economic evaluation of health care-related in Southeast Asian countries increased over the time. It shows that there is a good progress in economic evaluation studies in Southeast Asian countries as one consideration in health care program policy. The capacity of local researchers both in number and the role as first/correspondence author are more than researchers from outside. Local researchers conducted most of the studies. It can be assumed that such economic information is gaining importance in policy decision making for the particular setting.

It is also beneficial to review the economic evaluation conducted in other setting. The methodology employed in the studies and the results of the studies both can be useful to be adopted in other setting [1]. However, it is impossible to directly adopt other countries’ approaches using economic evaluation for priority setting because of several constraints specifically related to the context of each setting [4]. The users should consider many factors related to the characteristics of their own setting if they want to use the economic evidence from other settings as well as employ the methodology applied in other settings.

The trend of progress of economic evaluation studies in each country in Southeast Asia was different. It might be affected by several factors such as the differences of health system, support from the local government and international organization or other parties, and the activities of academic researchers.

For example, Thailand has done the health care system reform by implementing the Universal Coverage (UC) policy as the health insurance system which was started in April 2001 as a pilot project in 6 provinces and implemented nationwide in April 2002 [9]. The UC offers a package of healthcare interventions to patients at public facilities, which need economic evaluations information as one consideration to formulate the benefit package [5]. This factor influenced the high number of economic evaluation studies conducted in Thailand.

Another factor is the beginning and development of health technology assessment (HTA) in Asia. The main purpose of HTA is to inform technology-related policy making in health care, where policymaking is used in the broad sense to include decisions made in the level of institutional, regional, national, and international [10]. The HTA employ economic evaluation studies as one consideration in policy decision-making. Some countries in Southeast Asia have established the HTA to be used in the healthcare program implementation; such as Thailand, Singapore, Malaysia, and the Philippines [11].

Most of the authors were affiliated with the university and hospital. It shows the strong influence of academic researchers to the progress of economic evaluation studies, while the researchers from the hospital tend to conduct the studies for their own setting. A consideration number of studies involved the researchers from the government (ministry of health), which shows the gaining important of economic evaluation information to be used in policy making of the healthcare. Very few studies were conducted by the pharmaceutical companies. In particular country such as Australia, it is required for pharmaceutical company to submit economic evidence to the government’s committee if they want their products to be included in the benefit package, which is subsidized by government. In the future, this regulation is not impossible to be applied in Southeast Asian countries once they do the healthcare system reform.

Most of studies that revealed the funding sources got the funding support from international sources. It indicates the lack of domestic resource allocation on economic evaluation studies. More over, the studies were conducted only as a part of international research project, not as an initiation program from the needs of local setting. However, the positive effects came from the good networking with international collaboration.

The economic evaluation methods mostly used were COI and CA, which are the partial-economic evaluation. These methods cannot give direct information of economic evidence to guide the policy makers. However, the results of these studies could provide the information as input to conduct the further full-economic evaluation and give the figure of economic burden of such disease or unit cost of such healthcare program/intervention [12]. There was also a consideration number of the use of CEA and CUA in the studies. CBA and CUA can be used to assess allocative efficiency. CBA has the widest scope of the types of analysis because the monetization of outcomes enables inter-sectoral comparisons. CEA estimates the incremental cost and effect of a new program/intervention compared with current practice and provides an estimate of the efficiency or value of the new program/intervention. While CUA is identical with CEA which differ in the expression of the outcome in a combined measure of morbidity and mortality in terms of quality-adjusted life years (QALYs) or disability-adjusted life years (DALYs), therefore CUA is the preferred option in conducting economic evaluation of healthcare-related [13].

It is important to conduct economic evaluations focusing on interventions to improve decision-making, although not have to be based purely on disease burden. The studies should provide the information for guiding the
decision-making on the major health problems in the setting and therefore potentially have a large impact on population health [4]. From the studies reviewed, infectious diseases and chronic diseases were the most issues on economic evaluation of health care-related in Southeast Asian countries. According to the WHO’s data of global pattern of risks to health, infectious diseases were still the most major cause of disease burden in the developing countries as most of Southeast Asian countries [14]. Therefore, in the national level economic evaluations on infectious diseases including HIV/AIDS as well as vaccination should be the main priority instead of other issues.

It is necessary to point out the limitation of this review. Firstly, the method used in this study should find the more number of published economic evaluations of health care-related in Southeast Asian countries if the method was expanded to use more database sources and keywords. The review will give more real figure of economic evaluation researches conducted in Southeast Asian countries if it also consider the other data sources; such as national or regional published database, unpublished database as well as of the grey literature. Secondly, this study only reviewed small parts of the articles of published economic evaluation on health care-related in Southeast Asian countries, even without filtered the quality of the articles. However, this review could give a brief figure about the economic evaluation researches conducted in Southeast Asian countries.

V. CONCLUSIONS

A review was conducted of publications focusing on the economic evaluation of health care-related in Southeast Asian countries. Local researchers conducted most of the studies as well as the local authors had much participation in conducting the studies. It can be assumed that such economic information is gaining importance in policy decision making for the particular setting in Southeast Asia countries. A consideration number of studies on economic evaluation of health care-related in Southeast Asian countries gives possibility of using or adopting the economic evidences as well as the methodologies to be applied in other settings across the region.

REFERENCES


