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Review Article

A Review on Published Pharmacoeconomic Studies in Southeast Asian Countries

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ABSTRACT

Objectives: This study concerned on an exploration regarding pharmacoeconomic studies in Southeast Asian countries from the published articles. Its aim was to describe the situation of pharmacoeconomic studies conducted in Southeast Asian countries from the published articles and explore a brief of the methodology applied in the studies.

Methods: 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', 'healthcare', and 'southeast asia' was employed. Limitation was set for articles published at last 10 years in English language.

Results: 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 in the region accros-country. Thailand had the greatest number of publications (34), followed by Singapore (17). the number of articles regarding economic evaluation of healthcare-related in Southeast Asian countries increased over the time. The capacity of local researchers both in number and the role as first/correspondence author were more than researchers from outside. 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. Pharmacoeconomic study 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 pharmacoeconomic studies in Southeast Asian countries.

Conclusions: A review was conducted on publications focusing on pharmacoeconomic studies in Southeast Asian countries. Pharmacoeconomic study is gaining importance in policy decision making for the particular setting in Southeast Asian countries. A consideration number of pharmacoeconomic studies in Southeast Asian countries gives possibility of using the economic evidence as well as the methodology to be used in other settings across the country.

Keywords: review, pharmacoeconomic studies, published article, Southeast Asia.

INTRODUCTION

Pharmacoeconomics is part of economic evaluation, which 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 pharmacoeconomic studies distinguished by the experts in economics with the difference on how the consequences are measured. The types of pharmacoeconomic studies include cost-minimization analysis, cost-benefit analysis, cost-effectiveness analysis, and cost-utility analysis[1]. Those types are called full-pharmacoeconomics 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-pharmacoeconomics method[2]. The administrators should choose the method of pharmacoeconomic studies to be used in their studies based on several consideration such as the objective of the study, the characteristics of interventions, and the possible outcomes measurement. Pharmacoeconomics 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. Pharmacoeconomics guides policy makers wishing to maximise the benefits produced by the scarce resources available to them[3]. Each method of pharmacoeconomics could provide the specific information presenting the best possible choice of interventions that suitable for their problem and setting. Pharmacoeconomics has the potential uses include the development of public reimbursement lists, price negotiation, the development of clinical practice guidelines, and communicating with prescribers. Unfortunaletely there are barriers to using pharmacoeconomics, namely barriers relating to the production of pharmacoeconomics data and decision context-related barriers. In the western/developed countries such as Canada, the UK, and The Netherland; pharmacoeconomics has been formally accepted for use in policy decision making. While in Asia, only a few countries currently adopt pharmacoeconomics as a formal tool for informing health policy decisions. However,

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Table 1: Distribution of pharmacoeconomic studies in Southeast Asian countries by country/region and year of publication.

Setting of study	Year of publication										Number of studies
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Cambodia		1	1			1	1				4
Indonesia				2		1	1	3	1		8
Laos					1						1
Malaysia	1	1	2			1	1		1	1	8
Philippines	1					1					2
Singapore		2	1	1	2	2	2	1	4	2	17
Thailand	1	1	4	1	8	3	4	3	8	1	34
Vietnam	1	1	1	1	2			1	1		8
Region							1				1

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 pharmacoeconomic studies in Southeast Asian countries from the published articles. Its aim was to describe the situation of pharmacoeconomic studies conducted in Southeast Asian countries from the published articles and explore a brief of the methodology applied in the studies.

METHODS

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', 'healthcare', and 'southeast asia' was employed. Limitation was set for articles published at last 10 years in English language. Inclusion criteria were the study of pharmacoeconomics conducted in the settings of Southeast Asian countries or Southeast Asian region; either abstracts or full articles. While the searching excluded the review articles.

Data exctraction

The following informations were obtained from each study included in the review: type of document (abstract, full article); setting of study (country or region); year of publication; healthcare-related category; capacity of local researcher on the studies (articles written by local authors or written by outside authors or written in colaboration 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, cros sectional, prospective, modelling); and availability of funding for the study as well as the source of funding.

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[6-88]. Of the 83 articles retreived, 60 articles (72%) were full texts, while 23 articles were abstracts available only. Finally, the 83 articles retrieved were reviewed.

Setting of the study

Table 1 shows the distribution of the articles regarding pharmacoeconomic studies in Southeast Asian countries by the country/region and year of publication. It was found that the studies had been conducted in eight of eleven countries in the region and one study conducted in the region accros-country. Thailand had the greatest number of publications, followed by Singapore.

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 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 is 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 is bigger and they are mentioned as the first or correspondence author more frequence than the outside authors.

Affiliation of the author

The highest number of the articles were 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. Thirdten articles were written by authors affiliated with the hospital and 22 articles were written in collaboration of authors affiliated with hospital and other institutions. Nineten 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. Distribution of author affiliation was illustrated in Figure 2.

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 organisations such as the World Health Organisation (WHO), World bank/Programme of Advancement Through Health and Education (PATH), European commision, and many others. It was accounted for 21 studies were solely supported by international non-profit organisations. Four studies were solely supported by domestic public funds, while 3 studies were jointly supported by both domestic public funds and international non-profit organisations. 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 organisation supported 2 studies in this review. Finally, 4 studies clearly mentioned that they do not receive any funding support from other sources. The detail could be seen in Figure 3.

Method of pharmacoeconomic study

Figure 4 shows the distribution of pharmacoeconomic study methods applied in the studies. Generally, economists distinguish four type of pharmacoeconomic study methods which therefore are called full-pharmacoeconomic study 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 pharmacoeconomic study method which are called partial- pharmacoeconomic study method, however this method is not a true pharmacoeconomic study 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[89]. Among the type of pharmacoeconomic studies applied in the studies reviewed, partial-pharmacoeconomic study method (COI and CA) has become the predominant method of pharmacoeconomic study which accounted for 65%, while among the full-pharmacoeconomic study method solely, CUA and CEA have been used widely which accounted for 17% and 13% respectively.

Design of study

The design of pharmacoeconomic studies 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[90]. Among the studies reviewed, as presented in Figure 5, 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 employ modelling technique to conduct pharmacoeconomic studies.

Distribution of studies by disease/intervention category

Figure 6 shows the distribution of published economic evaluation 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[91]. 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 pilory infection); meningitis; sepsis; dengue fever; herpes-zoster infection; and communicable illnesses. Chronic diseases in the articles reviewed consisted of diabetes; ashtma; renal diseases; cardiovascular diseases; thalassaemia; rheumatoid and arthritis; and Parkinson's disease. 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 which 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 other explicit category mentioned in the group included perinatal care, tobbaco control program, overactive bladder, dental service, and medical devices usage and accounted for 9 studies.

DISCUSSION

Finding from the review shows that the number of articles regarding pharmacoeconomic studies in Southeast Asian countries increased over the time. It shows that there is a good progress in pharmacoeconomic 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. Most studies were conducted by local researchers as well. It can be assumed that pharmacoeconomic study is gaining importance in policy decision making for the particular setting. The trend of progress of pharmacoeconomic studies in each country in Southeast Asia is different. It may be affected by several factors such as the differences of health system, support from the local government and

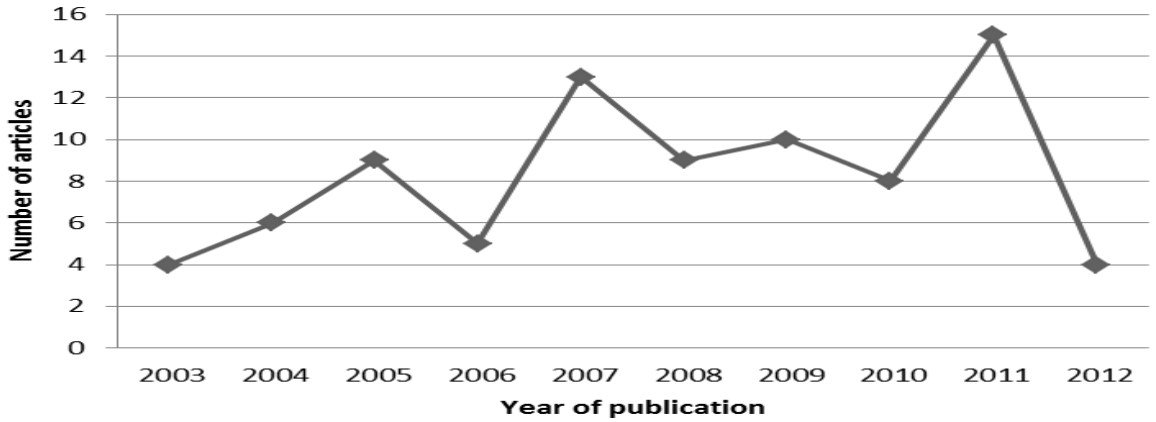

Figure 1: Distribution of pharmacoeconomic studies in Southeast Asian countries by time.

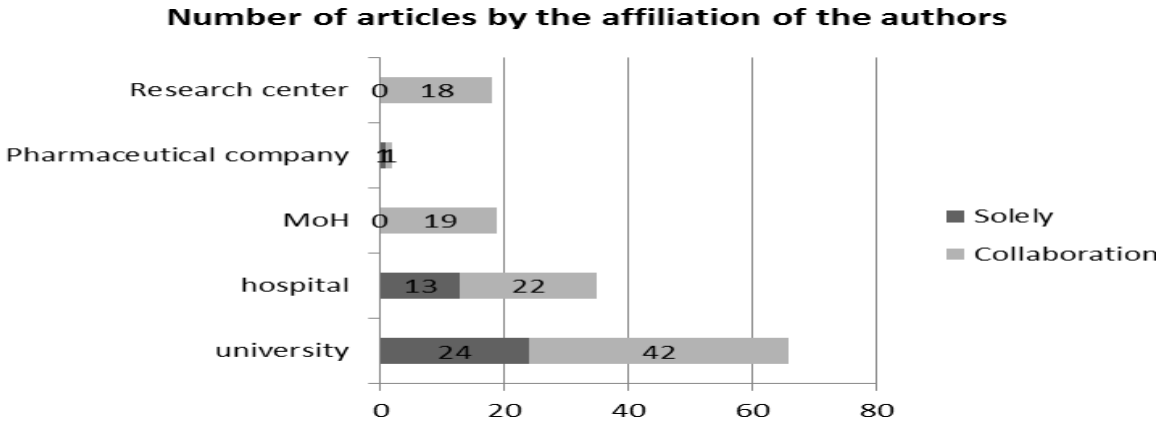

Figure 2: Distribution of pharmacoeconomic studies based on authors' affilation.

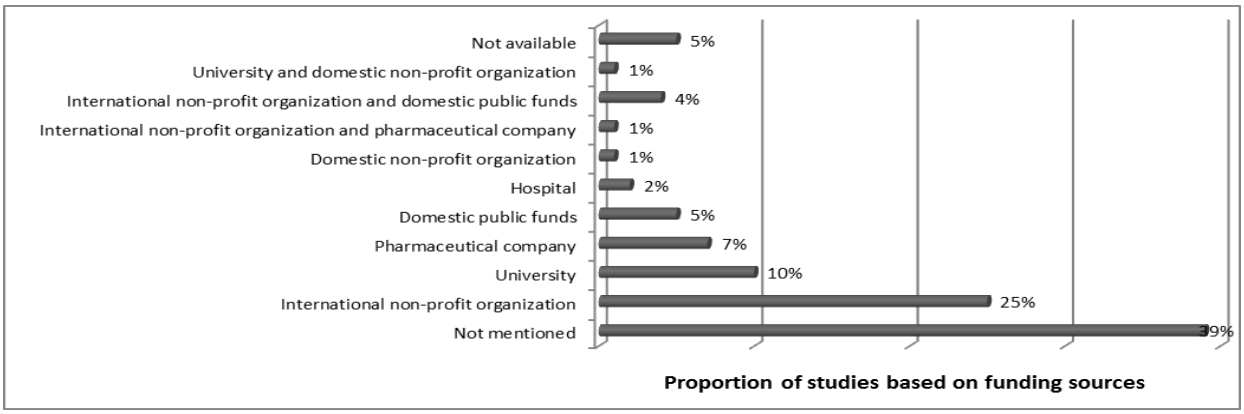

Figure 3: Distribution of pharmacoeconomic studies based on funding sources.

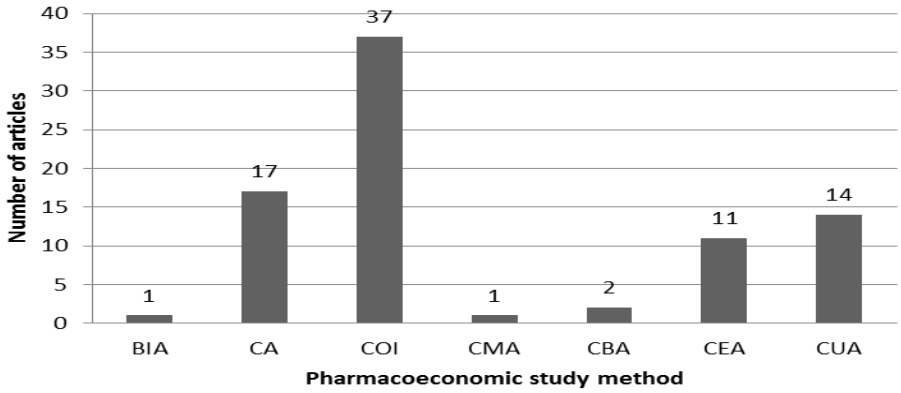

Figure 4: Distribution of pharmacoeconomic study methods applied in the studies.

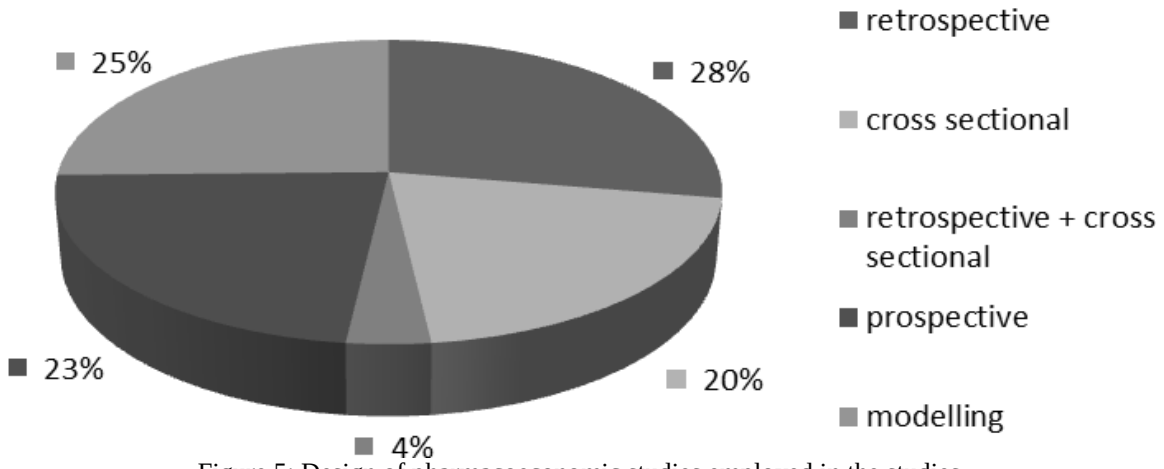

Figure 5: Design of pharmacoeconomic studies employed in the studies

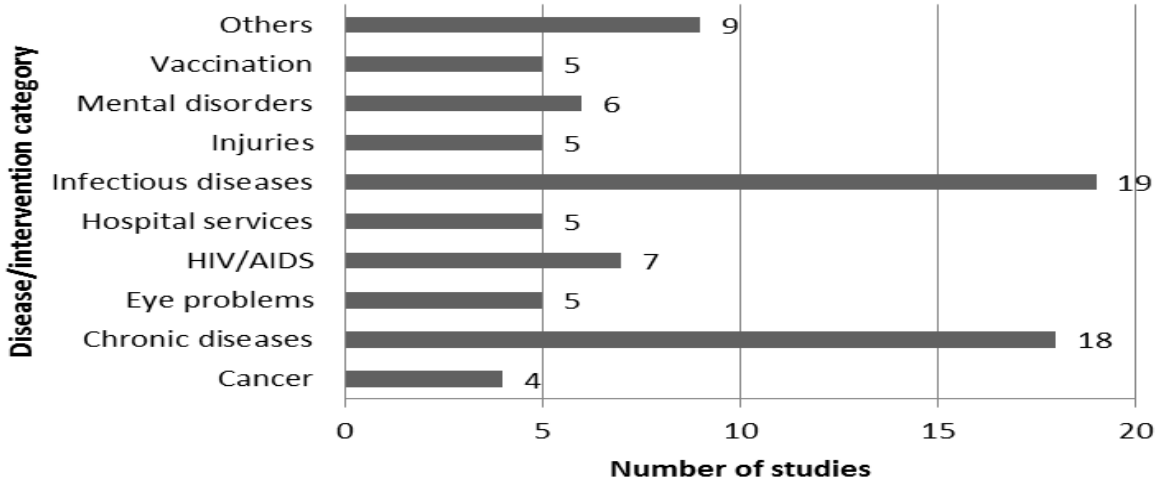

Figure 6: Distribution of pharmacoeconomic studies by disease/intervention category.

international organisation or other parties, and the activities of academic researchers. For example, Thailand had done the healthcare 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 province and implemented nationwide in April 2002[92]. The UC offers a package of healthcare interventions to patients at public facilities which needs economic evaluations information as one consideration to formulate the benefit package[5]. This factor influenced the high number of pharmacoeconomic 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 policymaking in health care, where policymaking is used in the broad sense to include decisions made in the level of institutional, regional, national, and international[93]. The HTA employ pharmacoeconomic studies as one consideration in policy decision making. Some countries in Southest Asia have established the HTA to be used in the healthcare program implementation; such as Thailand, Singapore, Malaysia, and the Philippines[94]. Most of the authors were affiliated with the university and hospital. It shows the strong influence of academic researchers to the progress of pharmacoeconomic 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 pharmacoeconomic studies 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 possible to be applied in Southest 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 pharmacoeconomic studies. The studies were conducted only as a part of international research project as well, not as an initiave program from the needs of local setting. However, the positive effects came from the good networking with international collaboration. Pharmacoeconomic study methods mostly used were COI and CA which are the partial- pharmacoeconomic study. This methods can not 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- pharmacoeconomic study and give the figure of economic burden of such disease or unit cost of such healthcare program/intervention[95]. There were also a consideration number of the use of CEA and CUA in the studies. CBA and CUA can be used to assess alocative efficiency. CBA has the widest scope of the types of analysis because the monetization of outcomes enables inter-sectoral comparisons. CEA estimates the incremental costs and effects 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 pharmacoeconomic studies [96]. It is important to conduct pharmacoeconomic studies 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 pharmacoeconomic studies 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 countris as most of Southeast Asian countries[97]. Therefore, in the national level pharmacoeconomic studies on infectious diseases including HIV/AIDS as well as vaccination might 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 pharmacoeconomic studies in Southeast Asian countries if the method was expanded to use more database sources and keywords. The review will give more real figure of pharmacoeconomic studies 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 pharmacoeconomic studies in Southeast Asian countries, even without filtered the quality of the articles. However, this review could give a brief figure about pharmacoeconomic studies conducted in Southeast Asian countries.

CONCLUSIONS

A review was conducted on publications focusing on pharmacoeconomic studies in Southeast Asian countries. Most studies were conducted by local researchers as well as the local authors had much participation in conducting the studies. It can be assumed that pharmacoeconomic study is gaining importance in policy decision making for the particular setting. A consideration number of studies on pharmacoeconomic studies in Southeast Asian countries gives possibility of using or adapting the economic evidence as well as the methodology to be used in other settings across the country.

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