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CONCEPTUAL ANALYSIS

Burden of Disease Studies in the Asia-Pacific Region: Are There Enough being Performed to Provide Information for Evidence-Based Health Policy?

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A B S T R A C T

Objective: To review published studies of Burden of Disease (BOD) performed in the Asia-Pacific (AP) region. **Method:** Overlapping strategy of searching four electronic databases was used to identify studies of BOD published during 1993-2009. The quality of identified studies was assessed according to the categories of burden reflected and scope of BOD information included. Chronological and regional distributions of research output were analyzed. **Results:** Among 524 articles identified for review, 27.7% (n=145) were classified as complete summary measures as being most informative BOD studies from health policy maker's perspective and 72.3% (n=379) as using only partial measures. Although an increasing trend of publication of BOD articles was observed, the quantity of publication was not commensurate with the number of diseases, especially for researches using summary measures. Unbalance of research output of BOD among different diseases areas and selected countries/regions was observed. **Conclusion:** The paucity of specific studies in AP region needs to be addressed. Furthermore, in order to improve the quality of research, a clear definition of BOD study and a uniform template for the research method from health policy-makers' perspective would be necessary.

Keywords: Asia-Pacific, burden of disease, cost-of-illness, research output.

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Introduction

The Asia-Pacific (AP) region is a diverse area that encompasses developed economies, such as Australia, Japan and Singapore, emerging economy countries like India and China, in which most of the population in the world reside, as well as poor and under-developed countries. Likewise, the health-systems in these AP countries are also diverse, but like other countries in Europe or North America, most of them are confronting similar challenges in delivering health care to their respective populations, namely: increasing health-care expenses driven by expanding aging population, increasing prevalence of chronic diseases and the need to incorporate costly new health technologies into the health care system. Given the demand and requirement to keep a balance between efficacy and cost containment to ensure that the available health resources are used in a cost-effective manner, evidence-based decision-making are gradually and increasingly accepted by AP countries in support of decision in formulating and funding of health policies and programs [1,2].

In the process of making the decision about which programs or interventions should be funded from the public purse, theoretically at least three criteria should be considered. These are the comparative efficacy and safety of the new technologies to existing treatments, the cost-effectiveness index, and the burden of disease (BOD). Fundamentally, the decision rule is that only health programs or health technologies (including new drugs, diagnostics, etc.) considered being cost-effective and producing positive net health benefits for the populations should be funded by public finance. However, to add complexity to the issue, due to the fact that resources are limited, not all potentially cost-effective services can be funded. Priorities must be made in allocating scarce resources and the new technologies or programs that can tackle diseases or disorders that inflict the greater burden to society would naturally be given higher priorities. Consequently, Burden of Disease (BOD) study with its objectives of quantifying the burden imposed by the disease or disorder can contribute to good decision making by helping priority setting for health planning, public health programs, research and development, as well as professional manpower training [3]. Furthermore, the results of studies of BOD can be incorporated into cost-effectiveness analyses when evaluating affordability of health interventions [4]. In addition, as a common currency, BOD results can also be used as an indicator of overall health status at the population level and compare efficiency of health care system

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across countries [5–7]. Hence, the information provided in the study of BOD in one country can serve as a benchmark or reference point for other countries.

Normally when talking about burden incurred by a disease, it refers to three aspects: epidemiological burden, economic burden and humanistic burden. The scope of BOD can be either broad or narrow depending on the perspectives adopted, such as the burden to the patients, to the health service provider, to the payer and to society. In addition, a number of approaches and indicators are used to assess the BOD. From the policy makers' perspective, however, indicators integrating as much information as possible that potentially highlight areas of greatest possible health gain and resource consumption are more contributive to decision making. Indeed, the evidence from Gross et al. in the United States showed this preference of policy makers when considering the relationship between disease-specific funding at National Institute of Health with several measures [8].

In fact, public health specialists have monitored the burden of some diseases for many decades with epidemiology parameters such as prevalence, incidence and mortality etc. [9–11]. Epidemiologic data can answer the question, "How big is the health problem?" in terms of number of people affected and the associated mortality (if applicable) in people afflicted with the disease or disorder in a specific country or district. It cannot reflect explicitly the magnitude of resource consumption and quality of life loss, caused not only by fatal effect but also by non-fatal effect of disease.

In early 1990s the Global Burden of Disease (GBD) Study was commissioned by the World Bank and co-sponsored by World Health Organization, in which Disability Adjusted Life Years (DALY) was adopted as a summary indicator [3]. This composite indicator combines the mortality and quality of life or morbidity data and gives a more comprehensive estimation of BOD. The result of 1990 GBD study revealed many previously under-appreciated and unmeasured burden when measured by mortality alone, for example mental disorders and hearing loss, which may cause considerable health impairment but no or few direct deaths [3]. In addition, to express the burden of disease in terms of both premature mortality and morbidity, various indicators besides DALY have been compiled and adopted to measure BOD, such as, Disability-Adjusted Life Expectancy (DALE), Disability-Free Life Expectancy (DFLE), Health Adjusted Life Expectancy (HALE) and Years of Healthy Life (YHL) [12–15]. Nevertheless, in these summary humanistic burden measures, epidemiological parameters are inputted to compute the outcome on a population level.

Another commonly used approach to ascertain the burden of disease is conducting a cost-of-illness study. The cost-of-illness (COI) analysis, first clearly spelled out by the health economist, Dr. Dorothy Rice, has been widely accepted as an effective measure of BOD, especially the economic burden [16]. In essence, COI study can translate simple descriptive epidemiology parameters into a measure of resource use and productivity loss in monetary terms. Normally, economic costs of disease are divided into direct, indirect and intangible costs. Direct costs are defined as the cost of all resources associated with the provision of an intervention or treatment for an illness. Indirect costs involve the costs that result from the loss of productivity because of illness or death. Intangible costs include the costs of pain, suffering, anxiety, or fatigue that occur because of an illness or the treatment of an illness. By capturing all these costs, COI not only grasps the direct economic burden incurred by disease, but also takes the economic effect of morbidity and mortality into account from social perspective.

Since the first publication of GBD appeared in World Development Report 1993: Investing in Health [17], many organizations and several countries became interested in applying the results of BOD and combining it with cost-effectiveness evaluation to better inform health policy [18–20]. Considering that health service research activity should reflect the relative interest in application of relevant information into decision-making process, the aim of the current study is to review the more recent output of BOD studies published in scientific journals from the AP region, where health economics and outcomes research are increasingly gaining interest [1]. This analysis will showcase the current status of BOD research in this region and whether there are sufficient studies of acceptable quality being performed and published in the public domain to support the need of policy makers in the AP region.

Methods

Data source

Electronic literature databases searched were Medline, EMBASE, EconLit and Cochrane Library. Overlapping strategy of searching several electronic databases was used to identify potentially relevant articles [21].

Time frame

A time frame was set and all entries between the years 1993-2009 were retrieved and analyzed. The final search of the databases concluded at August 29th, 2009.

Searching strategy

Papers were retrieved using a double-filtration process. Firstly, a subject filter selectively retrieved papers from the databases that are relevant to the subfield. We used the following terms, burden of illness, burden of disease, cost of illness, economic burden, health burden, to seek matches in the titles, abstracts and MeSH headings (Medline)/index term (EMBASE)/subjects (EconLit)/keywords(Cochrane Library) of published articles. This was followed by a geographical filter with names of the following 12 selected AP countries and economic entities: Australia, China, Hong Kong, India, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, Taiwan, and Thailand, to select more subsets in the title, abstract and MeSH headings/index term/subjects/keywords. Non-English publications were also included in the searching strategy. For the different searches, phrases were joined together with Boolean operators "AND" and "OR".

The electronic search was supplemented by an second overlapping strategy where the reference lists of retrieved full articles were searched manually to identify further relevant studies [21].

Culling criteria

Articles with English abstracts were included, as the aim was to review all abstracts and classify the papers in various categories, including type of paper, type of BOD indicator, main results, disease covered and the country of origin of the study. When a decision could not be reached based on information from the abstract, full articles were retrieved and read to make the decision. In the culling process, as our objective was to retrieve original studies, therefore, reviews, manuscripts which only cite BOD data as the supportive evidence, opinions, theory and historical description articles were excluded. In addition, articles were excluded if they focused mainly on intervention or programs controlling the BOD, validating instruments to measure BOD or other topics that did not evaluate BOD itself. If the abstract cannot provide enough information to make the judgment for inclusion and exclusion, the full text article was retrieved for further review.