

HEALTH ECONOMICS

(3)

Cost-of-illness studies (COI)

COI studies, sometimes also known as burden-of-illness studies, were among the first economic studies to appear in the literature. The first COI study mentioned in modern bibliographies dates back to 1920. In the late 1950s and early 1960s COI studies became increasingly popular.

The aim of COI studies is descriptive: to itemise, value, and sum the cost of a particular problem with the aim of giving an idea of its economic burden. Traditionally, COI studies have been used to highlight and to weight up the scale of different health problems for comparative purposes, both within a national context and internationally. In a traditional public health approach, health problems are usually weighted by expressing their measures of occurrence (incidence and prevalence), seriousness (mortality), and overall costs. Although COI studies are not complete economic evaluations, their aim is still to inform choices in resource allocation by estimating resource consequences of health problems in relation to each other.

Describing the social weight of an illness, and the definition of its place compared to other illness, not only heightens awareness of the problem but aids to insertion in a list of priorities. Thus, COI studies can help to focus society's attention on health and assist the decision-making process. COI studies have increased in frequency more recently as the pharmaceutical industry seeks to establish the potential of particular illness as commercial targets. Some COI studies are also used as precursors to full economic evaluations of the introduction of drugs or appliances, as the methods of valuing consequences are at times the same in both evaluation and COI studies. COI methodology, also used in the UK by research planning and commissioning groups, has been criticised because it takes into account only the costs of resources do not compare alternative uses of resources and therefore may not adequately measure opportunity costs.

*The essence of the methods employed in COI studies is: **recognition, identification, listing, measurement, and valuation of costs** generated by an illness. We use the term "costs" to indicate the burden of an illness.*

The first stage of the COI methodology is the identification of all cases of the illness in question; usually this is done on the basis of national statistics, if available, or by extrapolating to the whole population from a smaller survey. This stage suffers from the limitations of the epidemiological data on which it is

based, such as difficulty in case definition, incomplete knowledge of the natural history of the disease, under-notification of cases, and so on.

The second stage consists of identifying the cost generated by all the cases of the illness. Identification can be aided by a systematic qualitative research approach to identify all points of view of interested parties.

Traditionally, COI studies have examined the following costs:

Direct costs - borne by the health care system, community and family in directly addressing the problem.

Indirect costs - mainly productivity losses caused by the problem or diseases, borne by the individual, family, society, or by the employer.

Intangible costs - usually the cost of pain, grief and suffering and loss of leisure time. The cost of a life is usually included in case of death.

Two alternative strategies are used to collect cost data: the incidence and the prevalence strategies. The former estimates costs of cases from their onset to their disappearance for whatever reason (usually cure or death), while the latter estimates costs of all cases in a short period irrespective of the stage they are at. The incidence strategy is more precise but has greater information needs, is costly, and is used mainly for those diseases which have short duration and a fluctuation of incidence (i.e. infectious diseases). The prevalence strategy relies on more assumptions, but is the only practicable way to cost chronic diseases such as rheumatoid arthritis.

In general, COI studies are concerned with defining the value of resources directly used up by the illness. For example, one of the possible resource items of an illness is the number of days in hospital because of that illness. The total cost of such a hospital stay, however, does not represent the real "burden" of the illness to society as a part of the hospital costs are fixed and are independent from the existence of the disease. To identify the value of the resources directly used by the cases of the illness, COI studies estimate the "avoidable costs". These are the costs which are generated by the illness and which would be avoided if the illness did not occur. Avoidable costs are only gross estimates of values and seem inadequate, particularly to value indirect and intangible costs. Even so, the calculation is far from straightforward, and how to establish the avoidable costs of resources such as GP's time, preventive measures, and so on, is currently a matter of continuing debate.

The alternative manner of assessing costs of illness could be the so-called “willingness to pay” (WTP) approach, which estimates the burden of a disease by measuring what society would be prepared to pay in order to avoid that disease or problem. Although rarely used in COI literature, the concept is appealing because both opportunities and values are simultaneously considered but the practical application of WTP is full of difficulties, relating mainly to the questions asked and the meaning of answers given. Whereas the usual viewpoint for COI studies is the societal one, estimates of WTP are derivable only from individuals. It is unlikely that individuals have enough information to weight up the value to themselves of avoiding the disease, and they certainly do not have the information to assess the same value to society.

COI studies are interested in values, but deriving them is still problematic, this being a problem in common with most forms of economic evaluation. A sizeable number of COI studies, especially in the past, simply did not tackle the problem and presented lists of resources costed through their average costs leading often to unreliable and cover-inflated assessments of the burden of diseases.

COI studies are a good training for building economic evaluators as description of a problem always precedes its analysis.

The golden rule is:

- Keep direct and indirect costs separate and show resources and unit costs in different columns.
- Do not assume that you have identified all the relevant costs and benefits.

RESEARCH STEPS FOR A COST-OF-ILLNESS STUDY

Stage of economic evaluation	Example
Specification of the question, and baseline comparison group	Estimating the costs of asthma in a community, no comparison group
Specification of the viewpoint, type and coverage of economic study	Societal viewpoint. Cost of illness study, cost for one year
Specification of key outcome and estimation of effectiveness	Not relevant in COI
Specification of method for valuation of health outcomes	Not relevant in COI
Definition of cost to be estimated	Direct costs include hospital and primary care, and patients' travel. Indirect costs include days off work
Estimation of differences in of resource use	Analysis of hospital and primary care records provided estimates of use of health services. Patient interviews used to estimate time lost from work
Estimation of unit costs of elements of resource use	Hospital DRG data, national average pay rates for health care labour and valuation of day off work, acquisition prices for drugs and tests
Specification of analytic model	Simple cumulation of costs per case. Estimation of "avoidable" costs from prevention of disease
Taking account of time preference	Not applicable in this short term COI
Summarise economic result	Cost per case
Sensitivity analysis	Not done in this example