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Editorial

Why cost-of-illness studies are important and inform policy

Costs of illness studies are becoming more popular in industry, with the academic community and with the government. The issues raised are why these studies are important, why they are difficult to perform and how they can be useful to the healthcare community.

Why it is important

Cost-of-illness studies provide information at the micro- and macroeconomic levels, to help determine the acceptable price of innovations in the diagnosis and treatment of illness and to estimate appropriate funding for health policies. The target audiences of cost-of-illness studies are predominantly public or private institutions that decide to allocate resources to treat or prevent specific disorders. Therefore, it would be expected that researchers would preferably concentrate on key illnesses that represent an important burden both in direct and indirect costs. At the microeconomic level, researchers use cost-of-illness data in cost-effectiveness models: the price of an innovation that prevents or limits the progression of a disease can be estimated from the cost savings (by how much is the cost of the disease reduced) and the medical benefits. At the macroeconomic level, policy-makers look for information on how the healthcare money is spent or, in a more prospective fashion, on where to invest and what can be the expected returns on investment.¹

The use of cost-of-illness studies by policy-makers has been, to date, rather limited, because of the limited trust in the methods and the results as well as limitations of the budgeting process at government level. Governments may be drawn to prioritize funding for basic research rather than for disease-specific research, have election-driven agendas, and an annual budget setting, which conflicts with the need for long-term commitment of resources to finding ways to reduce the cost of illness.^{2,3} For example, the breakdown of total costs into hospital, ambulatory, physicians, tests, drugs and nursing can draw attention to possible reorganizations of inputs that would be more efficient. This is particularly true if international comparisons are available. An

example of such research would be studies of how care can be provided on an outpatient rather than inpatient basis or by nurses or podiatrists rather than physicians.

Why it is difficult

A 2008 review⁴ identified an average of 140–150 cost-of-illness studies for the United States published each year since 2000. Of these, few had adopted the Medicare perspective, as they seldom considered conditions affecting predominantly the elderly with the notable exception of Alzheimer's disease. This review identifies the methodological limitations of many cost-of-illness studies, including flaws in the identification of patients, and incomplete reporting of costs, use of costs and charges.

Cost-of-illness studies are still relatively scarce compared with economic evaluations in general and epidemiological studies. The reasons for this scarcity might be in part the difficulty of linking diagnoses to resource utilization and to identifying costs outside the healthcare system. Cost-of-illness studies that use insurance claims have at least two limitations in addition to methodological difficulties that exist with most administrative databases. The first one is data linkage in countries such as the United States where a patient can have several insurers over time depending on age and work status. An incisive description of the US healthcare system and its fragmentation, with consequences that reach further than the scope of cost-of-illness studies, was provided by economist Henry Aaron and applies to studies that use Medicare data:

“like many other observers, I look at the US health care system and see an administrative monstrosity, a truly bizarre mélange of thousands of payers with payment systems that differ for no socially beneficial reason, as well as staggeringly complex public systems with mind-boggling administered prices and other rules expressing distinctions that can only be regarded as weird. Consider Medicare's different rules for ‘Qualified Medicare

Beneficiaries,' 'Specified Low-Income Medicare Beneficiaries,' and 'Qualifying Individuals' and I rest my case.⁵"

Such a system does not favour the use of an administrative or insurance database for one thing and does not create an environment where stakeholders can share information and budgets. The second limitation is the limited information on indirect costs such as absence from work, reduced productivity and cost to the family.

The first limitation can be overcome by using models or databases of patient populations that will not likely change insurer. For diseases such as PAD that have costs fluctuating over time and varying by severity level, the absence of data linkage over time is a real issue. Cost of PAD studies produced by health plans use cross-sectional data that can be entered into a disease model.⁶ Data linkage over a long period of time is possible in the Veterans Administration population and the Medicare population.⁷ The external validity of the results (i.e. are the results relevant to populations other than the one included?), however, remains fragile. Thus, surveys on representative samples of the population are useful, although expensive.⁸ The second limitation can be partly controlled when the health insurance also pays leave of absence and unemployment benefits.

How cost-of-illness studies can be useful to the community

In the United States, the segmentation of health insurance makes a consistent policy of investment in health more difficult than in other countries. Diseases such as PAD or other cardiovascular diseases affect predominantly the elderly but their preven-

tion concerns the younger population in the workforce. The paradox is that employers' insurance should make the investment in prevention while Medicare would benefit from its return. This obviously is more difficult to achieve with multiple insurer systems than in unified systems with a national health service.⁹ Another difficulty relates to the viewpoint chosen for the computation of costs. Healthcare systems in developed countries involve at least three stakeholders: the providers, the payers, and the patients. The costs for one stakeholder are the revenue for another; the charges that are often used for cost-of-illness studies based on insurance claims differ from the costs to the healthcare providers. This may create confusion and inconsistencies. It also creates incentives and disincentives. For example, a medical or surgical specialty that benefits from the high reimbursement of a procedure will oppose the diffusion of a more efficient substitute, or a government agency will welcome an investment in prevention if it increases its budget but oppose it if it benefits a rival agency.³ The global model that would inform decision-makers on where to spend prevention money and how to reorganize the inputs for the production of health and healthcare is illustrated in Figure 1.¹⁰ Cost-of-illness studies contribute to this model by informing decision-makers on the cost of NOT making a decision to act upon risk factors compared with the cost of other prevention measures.¹¹

There could be a debate among vascular physicians as to the best strategy to draw the attention of policy-makers and payers to PAD. Cost-of-illness data could be presented either isolated from the cost of the other circulatory disorders, which is what Hirsch, *et al.* have done in their article that appears in this issue, or together with the costs for all circulatory diseases. The relative importance of each vascular disorder was described by the TASC

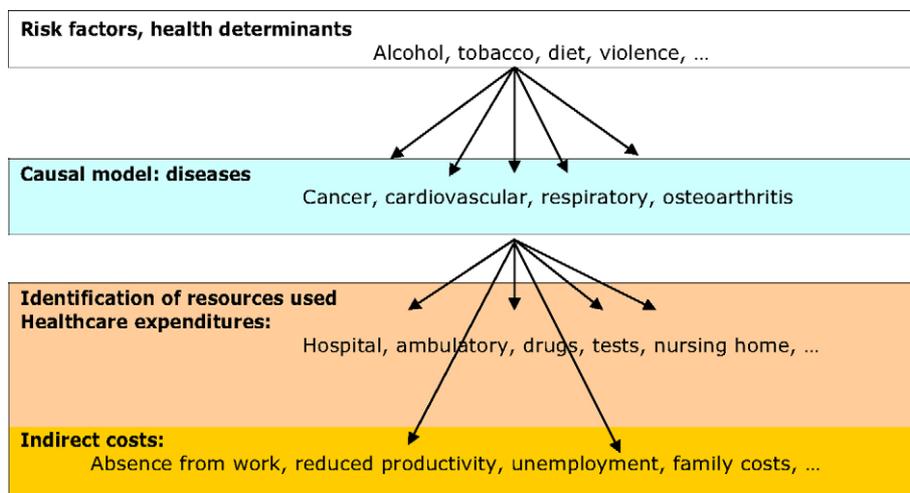


Figure 1 The global model for relating health determinants to cost of illness. Reproduced with permission from ref. 10.

statement.¹² The first option creates the possibility to channel resources directly to vascular departments and therefore might seem attractive. The risk, however, is that the cost of PAD looks small in comparison with cardiac and cerebrovascular diseases, which would be counterproductive. Hodgson and Cohen in 1999 estimated the total expenditure on circulatory disorders at \$129 billion USD,⁸ Kirschstein cited a cost of \$43.3 billion for cerebrovascular and \$183.1 billion for heart diseases in 2000,² while Hirsch, *et al.*, in this issue of *Vascular Medicine*, estimate the cost of PAD at \$4.3 billion for the Medicare population.⁷ The authors attribute this low cost in part to underdiagnosis and undertreatment of PAD. This is an important message because it could result in a recommendation of more active case-finding among Medicare beneficiaries. To draw the attention of policy-makers to the need for investments in the prevention of PAD, one possibility is to use the Saskatchewan data which shows that the burden of PAD is comparable with the burden of acute myocardial infarction.⁹ Another is to use the global model (Figure 1) and estimate the expected return on an investment in prevention and early treatment.

Patients should also be a target audience for cost-of-illness studies. In countries with high co-payments, patients have a direct interest in supporting investments in prevention and, on a more individual basis, to invest in healthy lifestyles. In countries with no or limited co-payments, the insurance theory of moral hazard predicts that patients may engage in risky behaviours if they do not bear the financial burden of its outcomes. In the case of diseases, however, money is not the sole issue and patients will also consider the loss of quality of life.

Thus, cost-of-illness studies need to be contextualized with information on research opportunities, opportunities for the reorganization of inputs, for the use of new technologies and, ultimately, added value to the healthcare system.

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