

Panel on Cost-Effectiveness in Health and Medicine Recommendations: Identifying Costs

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The assignment of costs in a cost-effectiveness analysis is a complex and disputed issue. The Panel on Cost-Effectiveness in Health and Medicine was convened to discuss standards that could be applied across a range of areas of cost-effectiveness. Additionally, the Panel had a mandate to resolve some controversial issues about the practice of cost-effectiveness that created difficulty in making comparisons across studies. The Panel proposed these guidelines: (1) Do at least some of the analysis from a social perspective; (2) Assign values to resources that reflect their opportunity costs; (3) Avoid zero counting of resources; (4) Avoid double counting of resources; (5) Make analyses only as exacting as necessary in a study. Difficulties in data collection were discussed. Among other questions considered by the panel were how to assign a value to the patient's time and which productivity costs to include in a cost-effectiveness analysis. With tools and suggestions from the Panel on Cost-Effectiveness in Health and Medicine, the cost analyst can report costs accurately and provide accurate comparisons of cost performance across states, trial modalities, or diseases.

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The part of a cost-effectiveness study devoted to cost would, one might expect, consist of a set of straightforward calculations. If so, one would no doubt be surprised to find how complex and disputed the issues that arise out of cost considerations truly are and how difficult data retrieval can be. The Panel on Cost-Effectiveness in Health and Medicine¹⁻⁴ was convened to discuss standards that could be applied across a range of areas of cost-effectiveness. Additionally, the Panel had a mandate to resolve some controversial issues about the practice of cost-effectiveness analysis that created difficulty in making comparisons across studies.

Five guiding principles came out of the analysis on the cost side: First, do at least some of the analysis from a societal perspective. The social perspective, which considers everyone affected by the intervention and considers all health benefits and costs that arise from it,³ is a natural way to make studies comparable—across states, trial modalities, or diseases. A social perspective also seems the appropriate one for a governmental body to adopt, as it “represents the public interest rather than that of any group.”^{3(p1174)} Sec-

ond, the values placed on resources should reflect their opportunity costs, i.e., the value the resources might have produced had they been spent on the best available alternative use.² Third, avoid zero counting, which might lead either to underperformance of some forms of treatment whose benefits would also be left out or to ignoring costs that would make some treatments appear to be less expensive than they actually are. Fourth, avoid double counting, for similar reasons; for example, do not include monetary values for lost life-years in the numerator of a cost-effectiveness ratio.² Fifth, make the analyses only as exacting as necessary. The most stringent analyses are extremely expensive. Often the gains from carrying them to the highest standard are minimal in the analysis and do not change the result. A rule of reason would suggest that, in some cases, studies can be less diligent about some elements. A cost-effectiveness ratio is a tool for comparing treatments, which can be used to assess the cost-effectiveness of treatments across diseases.

In creating a cost-effectiveness ratio, the numerator—expressed in dollars—is the value of all of the inputs that go into the process and the denominator—expressed in quality-adjusted life-years (QALYs)—is a measure of outcomes. Everything expressed in dollar terms goes into the numerator. Health improvement or decrements—everything not expressed in dollar terms—goes into the denominator. The QALY is a measure reached by combining the length of time certain health states persist in a patient with the quality of that time.³

The Panel faced many controversies. One issue concerned which productivity costs, if any, to include in the

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Table 1. Costs To Be Included in the Numerator in Cost-Effectiveness Analysis*

Costs of health care services
Costs of patient time receiving treatment/intervention
Costs of caregiving (paid or unpaid)
Other treatment-related costs (e.g., child care, travel expenses, additional custodial care)

*Recommended by the Panel on Cost-Effectiveness in Health and Medicine; measures current and future resource consequences and/or opportunities foregone, not just services paid for.

analysis. For the schizophrenic population, one should be concerned with opportunities foregone in terms of productivity and whether the patient's abilities are properly valued and reflected in the cost-effectiveness analysis. Productivity costs include mortality costs as well as frictional costs incurred in the form of absenteeism and worker turnover.² Finally, there is the issue of future costs. For example, a patient whose life is extended by a medical intervention is a potential consumer of health care resources that may be related or unrelated to the original intervention in the future. These costs should be considered in an analysis.

Other difficulties surround the assignment of value to patient's time in a cost-effectiveness analysis (Table 1). Keep in mind that an element of the analysis not associated with a dollar transaction can still be a cost. The question of how to include the patient's time spent receiving treatment, for example, has been a controversial one. Should such time be added to the numerator as part of the cost of an intervention, or should it be subtracted from the denominator as a decrease in life expectancy or affecting QALYs? The Panel concluded that patient's time spent receiving an intervention or treatment reflected an opportunity cost (because that time could have been spent differently) and should hence be incorporated into the numerator. In addition, the value of caregiver time from family, friends, and others, often without any dollars changing hand, should also be counted as a cost. Family members may take time off from work or leave the labor force to take care of a sick relative, and their time counts as resource costs that need to be included.

Health care costs must be tracked in any analysis. The Panel recommends these steps when identifying costs (Table 2): After identifying all possible areas that might be affected by the treatment intervention, the costs of those resources should be calculated. This recommendation applies regardless of the analysis being performed. Identify all gains and losses to all of the people who are affected, considering both current costs and future consequences. In some cases, certain costs and consequences will be trivial and not different between the treatments; these can be ignored. In most cases, resource use can be substantial; all of the resources used should be enumerated in the analysis.

Transfer payments are tracked by many analysts, and what may seem like a straightforward transaction can incorporate hidden complexities. For example, in some quar-

Table 2. Resource Identification Recommendations*

Identify and calculate all resources—current and future—from a societal perspective.
Include all germane and nontrivial resources in analysis, whether dollars change hands or not.
Include all direct health and nonhealth care costs due to treatment.
Include caretaking and other services related to treatment.
Include patient time seeking and obtaining treatment.

*Panel on Cost-Effectiveness in Health and Medicine.

ters there is speculation concerning how much government money in the form of disability payments could be saved by the early treatment of diabetic retinopathy. The Social Security Administration (SSA), for example, has to consider the consequences of having more individuals who are blind as a result of diabetic retinopathy added to the rolls of the disabled in terms of its budget. From a social point of view, however, the question is less easily settled. In this case, the disability payment (not the health payments that go with the blind person) are a transfer of money from one group of people to another, which should not, in principle, affect the overall balance: one individual's gain is another individual's loss.

There is an important exception, however. An analysis conducted from a social intervention accounts for all costs and health effects, regardless of who incurs them. Hence, employers, health maintenance organizations (HMOs), insurers, or individuals will not find the information necessary for making choices on the basis of their interests.³ In any kind of process that takes resources to administer the program, the parts of the program costs that constitute those administrative costs, not the disability payment itself, should be included in the analysis. In fact, in the case of some programs such as those administered by the SSA, the very lengthy process of becoming certified should be included. Mental health is one of the most problematic areas for disability. Sometimes as much as one third of the total expenses of the agency in this area go to the administrative process or include the cost to the individual of trying to become certified as disabled. These resources are consumed, and all of them should be included in a reckoning of cost from a social perspective, even if one excludes the disability payments.

It is difficult to assign a dollar value to services, even when the services germane to a particular cost-effectiveness study and the physical properties of those services can be defined. Hence, some services are never assigned a dollar value, as quality-adjusted life-years are not, because the attempt raises more questions than it answers—how to value the time of a schizophrenia patient, for example. Opportunity costs provide the conceptual basis for any assignment of dollar values to inputs or services, and the Panel found that the use of prices as direct measures of opportunity cost was a serviceable approximation, unless there was evidence that numbers supplied for prices were unreal-

istic with regard to the nature of the process. In this case, a correction factor should be estimated. The Panel debated most the value to be assigned to pharmaceuticals, particularly when higher prices are charged during the period of patent protection. Ultimately it was agreed that the transaction price was the only serviceable approximation. Constant dollars should always be used to correct for inflation over time when assigning values. If inflation of medical care or treatment is different from general inflation, the necessary adjustments should be made.

There are alternative data sources for doing cost-effectiveness analyses, including the use of claims or encounter data. But care must be exercised in retrospective studies using claims-based or encounter-based systems. Claims-based systems have advantages and some severe disadvantages that may make them very suitable for analysis in one case and unsuitable in another. Treat the data with caution or build data systems that avoid the inherent flaws of claims-based systems. Except in certain old-fashioned staff-model and group-model HMOs, claims data or encounter-based data are readily available and relatively inexpensive. They tend to keep track of the major transactions and kinds of services that are of concern in most analyses. On the other hand, claims-based systems were not designed for research, and so they tend to be consistently missing some data, such as information about expenses below a deductible.

A more common problem for estimating the costs of mental health care is that many insurance plans have an upper limit on spending for a calendar year or an accounting year. Information regarding costs incurred above this upper limit is lost because nobody has an incentive to collect it, and in any case such information will be incomplete. For example, if one were doing a study of hypertension control and wanted to know whether the doctor had taken a patient's blood pressure, a claims-based data system would lack that information. These measurements are not covered by health insurance, so doctors or providers lack the incentive to record them. Some encounter-based systems will create data collection efforts to address particular constituencies of patients. These efforts are atypical, however, and information about the nature of the patient's conditions or other influences is frequently missing; the incentive to provide it or the proper form by which to report it are missing. If one is investigating the care of all patients with schizophrenia, one would not find a schizophrenia diagnosis on all such claims. In fact, in certain circumstances, a different diagnosis or set of codes might be used if a differential payment for the new diagnosis were possible.

Claims-based systems have another problem, particularly evident in the last 10 to 20 years. When families have multiple wage earners and multiple insurance plans, much utilization data for individuals may be missing. When my colleagues and I⁵ looked at the Group Health Cooperative

of Puget Sound in the early 1980s, 13% of dollars spent were out of plan, paid out of pocket or, occasionally, by using other coverage. The problem is much more severe now. It is likely to remain severe whenever an insurance plan has an internal limit and policy holders may place dependents on one plan or otherwise make use of insurance in a way that obscures how resources are used. Auxiliary data collection efforts can overcome some of these problems. One can ask policy holders about whether they have out-of-plan coverage. One can ask them about the number of visits devoted to an out-of-plan provider. One cannot reliably ask people about the details of the services that are provided them, for they cannot offer data at the level of Physician's Current Procedural Technology codes (Chicago, Ill: AMA; revised annually) or information coded by any other diagnostic system.

There are 2 recall biases that also hinder data collection. First, people tend to forget events that are not salient, and events a few weeks old may not be salient enough for them to remember accurately. Second, they also have a tendency to telescope distant events into the present. Which of these two biases apply depends on the application. If your backup system is to rely on patient recall of visits out-of-plan for the last 12 months, be aware that patients will remember, perhaps, half of them.

Another alternative is to go to medical records and try to uncover the information one seeks. The difficulty with this approach is the extremely high cost of abstracting this kind of information and the fact that such research can rarely be done outside an HMO. If one can gain access to the records, quality data on outpatient treatment are scarce. The dearth of work in quality of care on an outpatient basis has to do with the quality of the data available. Nonetheless, if one is preparing a prospective study, it may be possible to design data systems that will address some of these problems.

The Panel on Cost-Effectiveness in Health and Medicine has provided useful ways of approaching costs in cost-benefit analyses, with guidelines for rendering nebulous concepts clearly. With these tools and suggestions, the cost analyst can report costs accurately and provide accurate comparisons of cost performance across states, trial modalities, or diseases.

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