



The Health Care Cost Elephant

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How much does knee arthroplasty cost? That is a more complicated question than it may seem upon first consideration. Based on my early career experience as a health care management consultant, I am confident that the correct answer is, “It depends.” It depends on the definition and scope of costs to be analyzed, it depends on from whose perspective the cost assessment is, and it depends, in part, on the purpose of estimating the costs in the first place.

The next few columns of “The Curious Economist” will examine various aspects of health care costs and cost analysis. This month, I introduce the types of costs to consider, the potential perspectives from which one can assess costs, and the established economic frameworks in which costs are analyzed and compared.

What and whose cost?

The Indian parable of the blind men and the elephant describes a group of blind men who come across an elephant for the first time. Based on cursory examination, they describe a rope, a tree trunk, a fan, or a wall. None of the descriptions match an elephant because each description is based on exceptionally limited information.

Similarly, estimates of health care costs in published studies vary substantially and usually reflect a limited perspective and

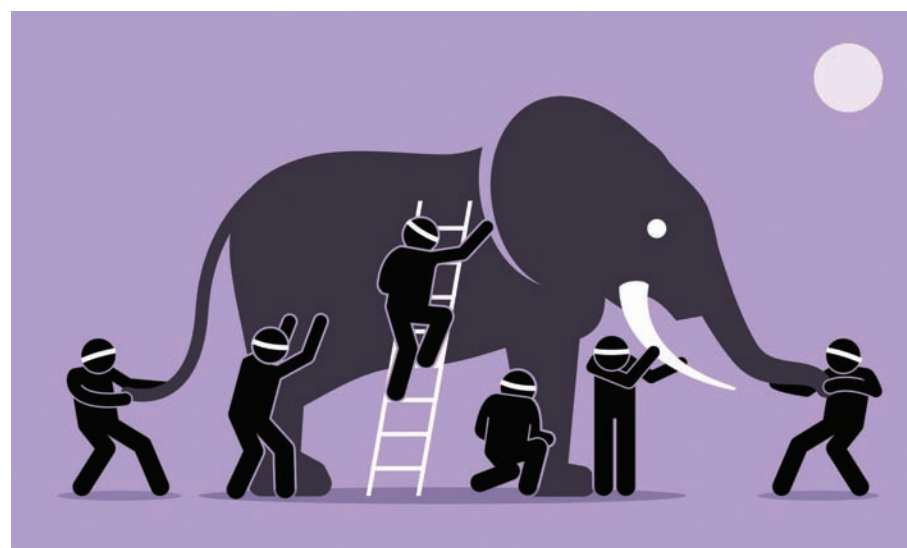


Figure: The Blind Men and the Elephant

only a piece of the total health care costs of the disease or health care intervention being studied. In this column, I use the term *intervention* broadly to refer to a health care program, set of services, procedure, therapy, or treatment; that is, actions or services undertaken to improve health.

Much of the cost analysis undertaken by health services researchers focuses on *direct* medical costs because these data are accessible in the publicly available medical claims files and within information systems of most health care facilities. These include costs as-

sociated with physician services, hospital inpatient and outpatient services, ambulatory surgery centers, drug costs, and non-hospital costs such as inpatient rehabilitation, skilled nursing services, and outpatient therapy services (e.g., physical, occupational, and speech therapy, and cardiac rehabilitation therapy). These costs reflect payments made by government payers and commercial insurance companies and the out-of-pocket expenses incurred by patients.

Although direct medical costs frequently represent the full extent of health



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care costs examined in the health services literature, these direct costs reflect only part of the health care cost “elephant.” Studies that attempt to provide a complete picture of health care costs and their implications include estimates of *indirect* costs. Indirect costs include transportation costs and the monetary equivalent of opportunity costs associated with the unpaid time required by the family and friends that provide transportation or caregiving services. Indirect costs also include lost wages due to individuals being out of work, worker replacement costs, and costs incurred because of reduced productivity from illness, disease, or recovery from a therapeutic intervention such as surgery.

As implied above, the relevant direct medical and indirect costs to include in a cost analysis are closely associated with the perspective of who is incurring the costs. In the case of a disease or health care intervention, there are several potential cost perspectives. The table on the next page provides a summary of health care cost perspectives and their relevant cost considerations.

In 2016 the Second Panel on Cost-Effectiveness in Health and Medicine, convened by the U.S. Public Health Service, recommended that researchers report on two perspectives: the health care sector perspective and the societal perspective (*JAMA* 2016;316:1093-1103). The panel also recommended that health care sector costs should include current and future costs, related and unrelated to the condition under consideration. The societal perspective should, per the panel’s recommendations, incorporate all direct and indirect costs regardless of who incurs the costs.

The panel recommendations exemplify the potential complexity of cost analysis. First, including *future costs* requires forecasting such costs, perhaps using predictive modeling techniques, since there are no secondary data sets with *future* payment or cost information. Second, since a dollar spent five years from now is valued less

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Perspective	Considerations
Patient	Direct out of pocket costs and indirect costs of lost income due to not working because of the disease or health care intervention
Third-party payers	Direct medical payments made to hospitals, physicians, and other health care providers
Caregiver(s)	Indirect opportunity cost of time required by family and/or friends to care for the patient or provide support services
Employer	Direct and indirect costs associated with loss of productivity and absenteeism
Society	Incorporates all costs regardless of who incurs the costs
Hospital or health system	Typically limited to “internal” costs related to facility, personnel, and supply expenses. The hospital may evaluate costs based on average or marginal (variable) expenses.

Table: Perspectives and Considerations Used in Estimating Health Care Costs

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than a dollar spent today, one needs to discount these future costs to “present value” (*Value Health* 2004;7:397-401).

Third, the recommendation that the health care sector costs include those related and unrelated to the condition under consideration is a highly debated topic among health care economists and other researchers who study health care costs. (*J Health Econ* 2008;27:809-18) For example, if coronary artery bypass grafting (CABG) extends a patient’s life expectancy by 10 years, then the direct medical costs and related indirect costs incurred by society during that additional 10 years should be included in the estimate of costs associated with the CABG. It is understandable if you, the reader, are not comfortable with this recommended approach. That is why most cost analyses estimate the incremental health benefits as an offset to the incurred costs.

It is not surprising that published health care cost studies vary substantially in the definition and scope of costs and the cost perspective studied. Most do not adhere to the above panel recommendations. Many published cost analyses are limited in perspective; they may examine only direct inpatient medical costs or out-of-pocket patient costs.

Types of cost analysis

Once the scope and types of costs have been identified and the perspective(s) of interest established, the remaining critical question is how to use the cost information. Although a hospital system may want to understand costs associated with selected health care services to assess their profitability or identify organizational resource requirements, the purpose of most health services research articles that include an estimate of health care costs is 1) to estimate the total costs or economic burden of a specific treatment or disease from a national perspective (e.g., the economic burden of obesity in the U.S.) or 2) to compare alternative health care interventions.

Health care policymakers are interested in both estimates. Approaches to compare alternative interventions help inform local, regional, and national health policy and medical decision-making. The most common frameworks when comparing alternative interventions are:

Cost minimization: If there is little difference in the outcomes among alternative interventions, this approach determines which intervention has the lowest cost.

Cost-benefit analysis: In this framework, the net social benefit of an intervention is defined as the incremental benefits of the intervention less the incremental costs, with all benefits and costs measured in dollars (Cost-Effectiveness in Health and Medicine.

Oxford University Press; 1996). Although it is challenging to convert improved health into a monetary value, even human life itself has been valued in terms of dollars. Kneisner and Viscusi estimated the value of a statistical life to be \$10 million in 2017 dollars, and this estimate has been generally accepted (*Oxford Research Encyclopedia of Economics and Finance*. 2019).*

Cost-effectiveness analysis (CEA): In CEA, costs and effects of an intervention and at least one alternative are calculated and presented as a ratio of incremental cost to incremental effect. Effects are typically beneficial health outcomes such as cases of a disease prevented, years of life gained, and complications or adverse events avoided, rather than monetary measures as used in cost-benefit analysis.

Cost-utility analysis (CUA): In CUA, a subset of CEA, the analysis focuses on utility measures of health outcome such as quality-adjusted life years or disability-adjusted life years. In CUA, health outcomes are adjusted by health state preference scores or utility weights. These preference scores and utility weights are validated tools that seek to incorporate individual preferences and recognize, for example, that quality of life, in addition to the quantity of life, is an important consideration when evaluating alternative interventions.

Health care cost analysis – The story continues

Future columns of “The Curious Economist” will continue the discussion on health care costs and cost analysis and will include these topics:

- Differentiating among charges, payment, and costs, and underscoring why it matters
- Describing the fundamental concepts of, and major approaches to, hospital cost accounting
- Exploring the role of core hospital information systems and the influence of physicians in cost-accounting approaches
- Tying together basic concepts to estimate the cost of knee arthroplasty
- Reviewing examples of and expounding on cost effectiveness analysis of perioperative services and
- Examining the relationship between cost and quality

I appreciate the opportunity to contribute brief articles on health economics to the *Monitor*. Although these topics may not be of everyday concern to anesthesia professionals, I hope that others are as curious as I am. I welcome your suggestions for future issues.

*Kneisner and Viscusi point out that the U.S. Department of Transportation (2016) uses \$9.4 million as the value of a statistical life, compared with \$9.7 million for the Environmental Protection Agency and \$9.6 million for the U.S. Department of Health and Human Services (*J Health Econ*. 2008;27:809-18). ■