Controversies and Opportunities in Economic Analysis of Health Care

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Health, and specifically the cost of health care, is of great concern to public policy makers and to the public. Medical care is something we all want, in large part because medicine has reduced death and disability dramatically over the last several decades. However, there is a significant problem of rising cost, today consuming approximately $2.4 trillion annually in the United States and increasing at a rate of approximately 6% per year. Health care consumes approximately 17% of gross domestic product in the United States in 2009 and is expected to reach 20% within several years. Without substantial changes in our health care system, health care costs will continue to increase and restrict other economic activities that are vying for these scarce resources. Thus, there has been great interest in health economics research to address the increasing problem of the high cost of health care.

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In this issue of Circulation: Cardiovascular Quality and Outcomes, 4 articles extend the impressive track record of the journal in presenting health economic issues, and are illustrative of some of the problems we face as a society and how investigators approach them. Patrick et al consider the cost-effectiveness of genotype warfarin dosing for patients with atrial fibrillation. They developed a simulation, in particular a Markov model, based on the medical literature. They found that for genotype guided therapy to cost less than $50 000 per quality-adjusted life-year saved, it would be necessary to increase the time within INR range by 9%. However, if the time within range was less than 5%, then the incremental cost per quality-adjusted life-year would exceed $100 000 per quality-adjusted life-year saved. Although detailed and carefully performed, this remains a simulation, not based directly on observed data within a randomized trial of genotype testing versus standard care. Nevertheless, the authors quite reasonably conclude that the cost-effectiveness of genotype testing is uncertain, and that caution should be exercised before widespread adoption.

Merchant et al considered the cost-effectiveness of therapeutic hypothermia in patients suffering cardiac arrest. The authors developed a simulation based on published Markov models. Their base assumptions led to an incremental cost-effectiveness ratio of less than $50 000 per life quality-adjusted life-year saved. At the extremes of their sensitivity analysis, the cost per quality-adjusted life-year saved would still be less than $100 000 per life-year saved. This analysis was carefully and thoughtfully carried out. It is, however, limited by the clinical data available: efficacy of hypothermia is based on 1 trial of 400 patients, estimations of cost, and projections of life expectancy.

Thanassoulis et al considered the impact of restrictive prescription plans heart failure medication use in Canada. Three provinces were considered: Quebec, Ontario, and British Columbia. Quebec has a less restrictive plan than either Ontario or British Columbia. In Ontario and British Columbia there was less use of more restricted medications such as β-blockers and angiotensin receptor blockers than would be expected by regional variation. This analysis was also carefully performed, and the authors are careful to note that it is difficult to be sure whether failure to use medications as prescribed was attributable to policy differences, or whether there was residual confounding. Nonetheless, the authors rightfully point out that restrictive prescription plans may have unintended consequences beyond the obvious attempt to save money.

Finally, Halpern et al considered the ethics of using financial incentives to reduce unhealthy behavior such as cigarette smoking. Although this has been a controversial area, the authors make a persuasive case that such incentives are ethical. However, it is uncertain that such policies would improve health. For instance, incentives might lead to more unhealthy behavior so that people would become eligible for incentives. The authors make a strong case that financial incentives should be thoroughly studied.

These 4 articles consider a variety of economic questions. The first two are more typical cost-effectiveness analyses, offering outcomes as a single number, the incremental cost-effective ratio, and then considering how sensitive this number is to variation in the input variables. The key points to consider in such analyses are (1) how valid is the comparator (whether no therapy, placebo, or active control), (2) how well validated are the input variables, and (3) how was uncertainty handled (both stochastic error due to the play or chance and other inaccuracies in the input variables) The next article considers the impact of policy on patient behavior, with the potential for unintended consequences on patient outcomes. The final article considers the ethics of policy approaches aimed at improving public health. These are all legitimate economic questions, because economics is fundamentally concerned with how people and their societal

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institutions make decisions in the setting of uncertainty and limited resources.

A major unresolved question in the United States concerns how to use economic studies to inform public policy. In much of the world economic data may be used to make policy. For instance, in the United Kingdom, the National Institute for Clinical Excellence uses economic studies to make recommendations to the National Health Service that may be used to make binding decisions on coverage. In the United States, the Food and Drug Administration is barred by law form considering cost in deciding whether a new therapy or test is safe and effective and will therefore get an indication. Payers, and in particular the Centers for Medicaid and Medicare services, do not use cost-effectiveness studies explicitly to make coverage decisions. Thus, how best to use economic studies to inform policy remains obscure in the United States. The argument against using economic data in deciding coverage is that available studies are often inadequate and that societal equity may not be well served by such decisions. Those who favor including economic data to make coverage decisions would point out that all data are limited and that information should not be excluded because there is a financial component. Rather, all information should be included, with the strength and limitations of each data type clearly acknowledged.

The question for our society is how we can make sensible decisions on therapy that are well informed and serve both patient and societal interests. This is the fundamental question addressed by health care economics, and properly considered economics can serve both patient-specific and societal goals. In particular, economics can help us find value in health care. The starting point is to recognize that we do not and cannot have a true market for health care such as is available for food stuffs. Whereas the price of tomatoes can be set by the market, the price of coronary artery bypass surgery cannot. First of all, it is much too expensive for all but a handful of people to pay for health care services, such as bypass surgery, by themselves. This underscores the absolute necessity of insurance, which separates the consumer of health care from the payer for health care. Second, it is not possible for the consumer to evaluate the quality of care being provided. Health care is complicated and evaluating quality is illusive, with experts often disagreeing on how best to assess quality. Patients will generally trust their doctors. The absence of a market, coupled with our current fee for service payment system and increasingly expensive high-technology medical care, has led to runaway health care costs.

The search for value using health care economics offers an approach to help control ever rising costs. Currently there is much interest in comparative effectiveness. It is generally recognized that decisions are often poorly informed, and that even guidelines are often based more on consensus than evidence. Thus comparative effectiveness seeks to find the best form of therapy. The obvious question is, “haven’t we been doing this already?” After all, this is what clinical trials are supposed to be all about. However, clinical trials, most of which are for registration with the Food and Drug Administra-

tration (or equivalent agency in countries other than the United States), may not always properly consider societal choices, and so federal agencies will have increased grant money for comparative effectiveness. Will cost-effectiveness be a part of comparative effectiveness research? There are those who will argue that there is too much potential for political influence if economics is considered in comparative effectiveness. On the contrary, however, it is hard to see how comparative effectiveness can be meaningfully conducted without considering health care economics and assessment of value. Thus, if treatment B is marginally more effective than treatment A and at much higher cost, treatment B may quite reasonably not be felt to offer good value.

Economics can also help inform major policy issues, although not providing the final answer in most cases. Thus as we move further from unrestricted fee for service medicine, economic studies can assess the impact of the choices we make. Policy decisions should be well informed, but considerable judgment is needed. Thus, it is not reasonable to set an arbitrary ceiling value for an incremental cost-effective ratio, and then not pay for anything above this level. In fact we will spend a lot to save a sick child. However, we do not spend very much on prevention. Economic studies can help us more clearly find and demonstrate value in the choices we make to prevent disease. Economics studies can also inform us about the limits of traditional medical care, and where improvements in health become a larger societal objective and responsibility. Thus, we are likely to find that traditional medicine will not be able to cope with the challenges before us in times of limited resources, increasing technology, and an ageing population without the insights provided by economic analyses. Thus, economic studies provide vital insights as to how society can best, and most ethically, help people prevent disease by leading healthier lifestyles and more judiciously allocating scarce resources.

Disclosures
None.

References
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