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# Methods for Reviewing Economic Evaluations of Community Preventive Services: A Cart Without a Horse?

Scott D. Ramsey, MD, PhD

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In a health care system with ever-rising demand and limited resources, economic assessment of medical technologies is important for those who make resource allocation decisions that affect the health of populations. Cost-effectiveness analysis (CEA) is the best-developed tool available for comparing the relative health benefits for expenditure among the myriad of available (and often competing) health care interventions. Since community preventive services are most often organized, financed, and delivered by institutions (e.g., health departments) that have competing resource demands and limited budgets, CEA can be particularly helpful. Helpful, that is, if the economic evaluations: (1) adhere to sound and consistent methods; (2) are updated regularly to incorporate advances in prevention practice; and (3) are presented in a way that facilitates comparison of programs.

In this issue of the *American Journal of Preventive Medicine*, collaborators from the Centers for Disease Control and Prevention (CDC), local government, the academic community, and industry take on the important task of establishing guidelines for systematic reviews of economic evaluations in community prevention.<sup>1</sup> Interestingly, although their effort makes excellent progress in addressing issue (3) above, the barriers they address in the “methods” section highlights many issues related to (1) and (2) that limit current usefulness of CEA to decision makers in this field. Some of these barriers are practical, but many are methodologic, and thus are areas for future research.

First, there is the practical issue of availability of studies. As the authors note, there are very few economic evaluations of community prevention services. Ironically, several landmark cost-effectiveness analyses have been in the field of prevention; for example, pneumococcal vaccine,<sup>2</sup> hypertension screening and treatment,<sup>3</sup> and nutritional supplementation.<sup>4</sup> In some cases, the omission may be justified; economic studies

may not be appropriate until a consensus has developed in the clinical community that a particular intervention is effective. In other instances, however, CEA can inform the debate over the desirability of a particular intervention in ways that are neglected by clinical studies. Prostate cancer screening is one such example. Much of the debate on prostate cancer screening has centered on the degree of survival benefit that may be afforded through screening. Researchers under contract from the Office of Technology Assessment, however, were among the first to highlight that the years of diminished quality of life that can stem from screening (particularly urinary incontinence and impotence in those who receive prostatectomy) should also be weighed against the survival benefits, particularly for early stage disease.<sup>5</sup>

Why are so few of the more than 21,000 published cost-effectiveness studies available on MEDLINE devoted to prevention? Although there are likely to be several reasons, one of the most important is that there are very few sources of funding for economic evaluations of community prevention services. Much of the funding for CEA studies comes from pharmaceutical and device manufacturers. Because community prevention services often are not a marketable “product” per se, there has been comparatively little interest from industry (except when the intervention might increase use of a particular drug or device). Thus, there is a role for government funding of this research. The CDC, the Agency for Health Care Policy and Research (AHCPR), and branches of the National Institutes of Health (NIH) (most notably, the National Cancer Institute, [NCI]) have been working to address this deficiency, but overall the need for research vastly outstrips available resources to conduct it.

After the fundamental issue of lack of studies, the other major barrier to incorporating economic evaluations into the decision-making process for community prevention is the difficulty with the evaluations themselves. Simply stated, the methods for conducting these evaluations have historically been poorly developed and inconsistent. The authors discuss at length this particular problem for their task of systematic reviews. Without sound, consistent methods and reporting it is

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From the Department of Medicine, University of Washington, Seattle, Washington; Fred Hutchinson Cancer Research Center, Seattle, Washington

Address correspondence and reprint requests to: Scott D. Ramsey, MD, PhD, Center for Cost and Outcomes Research, University of Washington, 146 North Canal Street, Suite 300, Seattle WA 98103. E-mail: sramsey@u.washington.edu.

difficult to bring together and interpret the body of evidence for the intervention. As they note, recent efforts within the cost-effectiveness community to standardize methodologies for conducting and reporting cost-effectiveness analyses (most notably, the Panel on Cost Effectiveness in Health and Medicine) should reduce the variability in future studies.<sup>6</sup> What they do not emphasize, however, is the potential danger of moving forward with systematic review when the body of literature for the review is, in general, unsound, insufficient, or not translatable to current practice.

Conducting and publishing a systematic review implies that the sum of available studies is better than the parts. Unfortunately, for many economic evaluations of community preventive services, this is simply not the case. Here is where the greatest difficulty lies in the systematic review procedures proposed by the Task Force for Community Preventive Services: In order to capture as much of existing research as is available, the criteria for including studies in the review focuses on *consistency* rather than *quality* in methods and reporting. The problem is that unless the methods for the published economic evaluations is uniform and of high quality (a rarity), this approach will inevitably lead to imprecise and possibly misleading estimates.

Of primary concern are economic evaluations that use intermediate endpoints as measures of effectiveness (e.g., compliance with vaccine or screening behavior) rather than final health states (life expectancy, quality-adjusted life expectancy). Such studies can intentionally or unintentionally imply that a promotion program is justified when in fact: (1) the cost-effectiveness of the intervention being promoted is still open to question or (2) adding the cost of the promotion program to the cost of the intervention renders the intervention much less desirable from an economic standpoint. For example, based on efficacy data, the U.S. Preventive Services Task Force recommends diphtheria-tetanus boosters every ten years.<sup>7</sup> Economic evaluations of regular boosters, however, generally do not find that this recommendation is cost-effective.<sup>8–10</sup> Thus, even a highly cost-effective community promotion program aimed at improving tetanus booster rates will only ultimately worsen the cost-effectiveness of the booster + promotion program.

A second major quality issue is omission of key resources from the cost portion of cost-effectiveness analyses in community prevention. Unlike much of the health care sector, community interventions often rely on donated work space and volunteer labor to accomplish their goals. While these inputs may be “free” from the perspective of the program, they are not truly free from the perspective of society. Space can be allocated for other uses and volunteers can spend their time elsewhere. In addition, “fixed costs” such as program startup and staffing costs (e.g., purchase of computers, program personnel costs) that should be counted are

frequently omitted (perhaps because they were “covered” by the grant that funded the study). Omitting the value of these inputs underestimates the cost of the programs and thus can falsely improve cost-effectiveness estimates. Notably, at least half of the studies listed in the author’s review of community vaccine promotion studies listed by Carande-Kulis et al.<sup>1</sup> appear to omit resource costs from at least one of these categories.

Finally, a subtler but important issue to note is that shifts in public awareness, social norms, and technological improvements in the process of delivering community prevention services can substantially alter the cost-effectiveness of these programs over time. Thus, simply updating older studies to account for price inflation (as the authors have done, admirably noting the distinction between health and non-health-related inflation for separate inputs) may miss more fundamental changes that have occurred since the study was originally conducted. For example, it might be argued that public education programs for breast cancer screening have shifted community promotion needs from *awareness* to *compliance*, whereas colorectal cancer screening programs still are at a stage where better awareness of the service is needed. Therefore, older community promotion efforts for breast cancer screening may be less appropriate (and less cost-effective) today because of the shift in public knowledge regarding the benefits of this intervention.

Where does this leave us? Unfortunately, with very few studies to begin with, and very few left after applying strict quality criteria, creating a process for systematically evaluating economic studies in prevention effectiveness is a bit like building a cart but finding there is no horse to pull it. Notably, the Task Force on Community Preventive Services also has concerns about the current state of CEA in community prevention, noting that, “procedural difficulty—and inconsistent availability of economic studies across topics,” prevents using the results of economic evaluations to alter the status of a recommendation.<sup>11</sup> This would appear to be a wise strategy until the quantity and quality of economic evaluations moves closer to the other disciplines that are applied to community prevention research.

Despite present concerns, the future is brighter for systematic reviews of economic evaluations for community prevention services. Standards established by the Panel on Cost-effectiveness in Medicine and others will improve the quality and uniformity of future evaluations. Trial-based evaluations of community-based preventive services are becoming more common. Recent interest and methodologic developments for conducting economic analyses directly alongside clinical trials promises to improve the robustness and timeliness of economic data for evaluations of community interventions as well.<sup>12</sup> The methods for systematic review of economic evaluations provided in this issue of *American Journal of Preventive Medicine* are an important first step.

It is advisable to use caution in applying them, however, until further “quality filters” are developed when selecting studies for review.

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Dr. Ramsey is a recipient of the National Cancer Institute's Temin Career Development Award (KO1 CA7 6189).

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Methods for reviewing economic evaluations of community preventive services: a cart without a horse? Ramsey SD., American Journal of Preventive Medicine, Vol 18 No 1S, pp 15-17,  
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