

# Promoting Evidence-Based Public Health Policy: Can We Have Better Evidence And More Action?

When the science base is adequate, policymakers can more rapidly translate results into decisions and then into actions.

by **Jonathan E. Fielding and Peter A. Briss**

**ABSTRACT:** Evidence-based approaches (those explicitly linked to the best available scientific evidence and reflecting community preferences and feasibility) are increasingly used to inform health policy decision making on the burden of a disease attributable to particular causes, interventions and policies that might work to confront those causes, and issues of community fit and feasibility. This paper introduces several tools for evidence-based public health: the health impact assessment, the systematic review, and a portfolio for assuring community fit and feasibility. Discussion of these tools serves as a springboard to consider how to better bring scientific evidence to bear on real-life health issues. [*Health Affairs* 25, no. 4 (2006): 969–978; 10.1377/hlthaff.25.4.969]

**M**ANY IMPROVEMENTS IN THE HEALTH OF POPULATIONS result from the introduction of evidence-informed policies or programs that affect the likelihood of acquiring a disease, the severity of the disease, the receipt of timely and effective care and treatment, and, for communicable diseases, the likelihood of disease transmission. Harnessing and constantly improving the available science in support of effective public health action reflects a centuries-long public health tradition. Examples include a very broad range of activities such as the introduction of childhood vaccination, environmental changes that improve workplace safety, fluoridation of community water supplies, and improved public health interventions to control the risk factors for heart disease and stroke.<sup>1</sup>

These and other successes in using the best available science to support community health are only part of the picture. Despite the billions of U.S. tax dollars

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spent on research and the more than a trillion spent on service delivery, movement of evidence-based interventions into communities and health systems is often slow.<sup>2</sup> Making faster and better use of scientific information could increase the value of public investment and help ensure that policies designed to improve health have their desired effects. Accelerating the integration of scientific discoveries into routine public health practice and policy deserves priority attention.

■ **Key questions for policymakers.** Public and private decisionmakers on health issues must address a series of difficult questions when choosing programs and policies: What is the likely disease burden that might be prevented or reduced? Which programs and policy options are likely to result in meaningful improvements in health? How will the benefits be distributed among the affected groups? Which potential solutions are appropriate and feasible for a specific situation, considering (1) the fit between strategy and the community context, (2) political and technical feasibility, and (3) cost and cost-effectiveness?

Public health science has the potential to inform these decisions but requires effort and investment at every stage, from production of primary studies to synthesis of results across studies and then to translation of research-tested findings into effective community action. For the health of the public to be protected and improved, it is critical that interventions be based on the best possible scientific evidence; that we continuously strive to improve and expand the scientific evidence base; and that we actively promote the use of the best-available, science-tested programs and policies.

■ **Working definition.** For this paper we have adopted Neal Kohatsu’s definition of *evidence-based public health*: the process of integrating science-based interventions with community preferences to improve the health of populations.<sup>3</sup> Lucy Rychetnik and colleagues, expanding on earlier work by Ross Brownson and colleagues, have identified three types of scientific evidence that can support evidence-based public health decisions.<sup>4</sup> Type 1 evidence defines causes of disease and their magnitude, severity, and preventability and helps determine that “something should be done.” Type 2 evidence shows that specific interventions do or do not work to promote health and help inform decisions about “which interventions or policies should be done.” Type 3 evidence shows how and under what conditions interventions were implemented and how they were received, informing decisions about “how something should be done.”

All of these types of evidence can come from a range of sources with differing levels of rigor and local relevance. A person’s hunch, an anecdotal observation, the expert opinion of a group, a formally designed and executed scientific study, or a group of studies all can constitute evidence. In general, however, scientific studies

produce more reliable information than the alternatives, and multiple studies are better than single ones.

■ **Key questions for evaluating evidence.** To improve their confidence in the reliability of the evidence for supporting policy choices, policymakers might ask the following questions: Were those who participated in producing or evaluating the scientific information well qualified? Was the process for considering the evidence transparent and free of conflicts of interest? What kind of evidence was considered? Was it from scientific studies or from anecdote or expert opinion? Was the information confirmed in more than one study? Do the studies represent all of the available studies on the topic? Were they of good quality? How were the results summarized? How do the conclusions relate to the information presented?

■ **Tools to support evidence-based public health.** Evidence-based public health provides a range of sophisticated tools for marshalling the best available scientific information to support public health decisions. The tools discussed in this paper—health impact assessment (HIA), systematic reviews, and a portfolio of tools for assuring community fit and feasibility—are essential supports to evidence-based public health. Our intent is to illustrate the challenges and opportunities inherent in using scientific evidence to help address real-life health challenges and provide some examples of how these tools have contributed to real-world decisions.

### **HIA: To Determine Whether Something Should Be Done**

Decision making about health-related programs and policies first require credible information on causes of health burden and health disparities. Social, economic, and physical environments are the major underlying determinants of the health of populations and variations among subpopulations. For example, economic disparities, lack of educational opportunities, and lack of affordable housing all contribute to preventable disease and injury burden.<sup>5</sup> Thus, understanding the contributions of these factors to the rates and severity of many diseases is critical to health improvement strategies.

■ **Assessing the health burden and improvement potential.** The HIA is one approach to assessing both the health burden from conditions in sectors other than health and the potential of health improvements by modifying those conditions. An HIA is a combination of procedures, methods, and tools by which a policy, program, or project may be judged as to its potential effects on the health of a population and the distribution of those effects within the population.<sup>6</sup> HIA can facilitate intersectoral action to improve health by evaluating health effects of actions in sectors such as agriculture, education, economic policy, transportation, and housing.

HIA, more commonly employed in Western Europe and New Zealand and Australia than in the United States, can be used at the community level to maximize positive health effects and minimize adverse health effects of a project—such as an airport enlargement, a new housing development, or a transit system expansion. It can also be used at a policy level to determine the potential health effects, both

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positive and negative, of a specific proposal for an ordinance, law, or regulation.

In its broader context, HIA can be used both to influence specific proposals and to help decisionmakers learn about the importance of considering health effects in many decisions in nonhealth sectors. For example, studies in San Francisco and Los Angeles have assessed the likely health effects of requiring city contractors to pay a “living wage” to their employees and provide or contribute a fixed amount toward their health insurance coverage.<sup>7</sup> Benefits to health included those resulting from higher overall income as well as those associated with obtaining coverage. Another recent study estimated the health effects of establishing a walk- or bike-to-school program at elementary schools.<sup>8</sup>

■ **Requirements for HIA use.** HIA requires a high degree of interdisciplinary and intersectoral collaboration, well-trained practitioners, appropriate data sets for analysis, and funders that recognize the value of the collaborations and the information. Most public health researchers are not familiar with the transportation literature or the literature on educational interventions to improve academic performance. Identifying and combining results from studies of acceptable quality and execution in sectors other than health may require different search strategies and criteria for which studies should be included. In addition, the health effects of specific policies need to be systematically identified and quantified. As an example, positive effects of increased walking to school include more physical activity for children and their parents and a possible small reduction in obesity. Adverse effects of walking to school might include an increased risk of an injury either through being hit by a car or bike or from interpersonal violence. Again, community context is important. In some parts of urban areas, the level of violence makes a walkability program for children inadvisable.<sup>9</sup>

■ **Impact outside the health sphere.** Because of their focus on specific policy options facing decisionmakers, HIA is more likely than other evidence-based decision tools to affect decisions outside the health sector. HIA educates decisionmakers about how the public’s health is strongly influenced by many decisions in spheres outside health. In so doing, HIA can expand the involvement of public health agencies into new forums. In Los Angeles, for example, the health department is increasingly involved in policy discussions about land use, development of pre-schools, and affordable housing.

However, the HIA literature is in an early stage of development.<sup>10</sup> Defining and quantifying how the public’s health is affected by altering policies in other sectors remains unexplored or elusive in many cases. For example, what might be the benefits to health over the life course of reducing the high school dropout rate by a certain percentage? To what extent could health be improved and disparities re-

duced by a sustained reduction of one-third in the number of families living below the federal poverty level?

There is no registry of HIAs where public health and other decisionmakers can find out whether specific questions have been addressed and the answers obtained. However, as the importance of the underlying determinants on health becomes more widely appreciated, it is likely that there will be increased demand for HIAs and access to this body of analytic studies. As legislators at the national, state, and local levels recognize that important health effects, both positive and negative, can ensue from policy decisions in other sectors such as education, welfare, transportation, urban planning, commerce, and agriculture, they could require the performance of HIAs before major legislative proposals are considered.

### **Systematic Reviews: To Assess What Should Be Done**

A systematic review is a formal process that identifies all of the relevant scientific studies on a topic; assesses their quality, individually and collectively; and sums up their results. Systematic approaches for summarizing scientific evidence and linking that evidence to practice and policy recommendations increase the transparency, understandability, and credibility of recommendations.

Systematic reviews make it easier for practitioners and policymakers to understand all of the relevant information that is available, how it was collected and assembled, and how the conclusions and recommendations relate to the information that was reviewed. For example, the Cochrane Collaboration was created in 1993 to facilitate well-informed decisions about health care issues by preparing, maintaining, and promoting the accessibility of systematic reviews of the effects of health care interventions. By 1999 Cochrane had expanded to address issues of health promotion and public health.<sup>11</sup> The Campbell Collaboration, founded in 2000, has aims that are similar to those of Cochrane for topics related to education, crime, justice, and social welfare.<sup>12</sup> The Campbell Collaboration reflects growing interest in systematic reviews within the social science community.

In the health sphere, reviews now summarize information on the efficacy of medical treatments, clinical preventive services, public health interventions and policies, and related social policies. Although most published systematic reviews have focused on clinical issues, there is nothing inherent in systematic reviews or evidence-based practice that limits them to either clinical issues or specific research designs such as randomized trials.<sup>13</sup> There is increasing international interest in broadening the range of topics and types of evidence that are considered.

Use of scientific evidence to support practice recommendations has been most prominent in clinical medicine. Early examples of the use of systematic reviews to support recommendations about clinical preventive services came from the Canadian Task Force on the Periodic Health Examination and the U.S. Preventive Services Task Force.<sup>14</sup> More recently, the desire to bring the best available science to bear in improving health at the population level resulted in the creation of the

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Task Force on Community Preventive Services to support public health decision making.<sup>15</sup>

The following examples of systematic reviews and evidence-based recommendations, from the task force’s *Guide to Community Preventive Services* and selected other sources, illustrate the types of conclusions reached and how results have or have not been translated into practice, policy, and additional research.

■ **Contribution to tobacco control policy.** Tobacco use remains the single largest cause of preventable premature death in the United States, and systematic reviews have identified many effective counseling and drug therapies.<sup>16</sup> Although most smokers want to quit completely, fewer than 30 percent receive counseling, and nicotine replacement therapy is prescribed for fewer than 5 percent.<sup>17</sup> A systematic review of published studies, conducted on behalf of the Task Force on Community Preventive Services, has also shown that providing effective cessation therapies at low or no cost results in greater use of these effective therapies and more success in quitting.<sup>18</sup> For example, these reviews have shown that for every 100 smokers covered by these policies, about 8 additional people stop smoking. Based on this review, the task force recommended that this strategy be implemented on the basis of sufficient evidence of effectiveness.

Availability of better scientific consensus on the efficacy of smoking cessation treatment and on the contributions payment policies make to increased cessation might have contributed to the increased use of these policies. For example, from the mid-1990s to the mid-2000s, the numbers of state Medicaid programs covering these treatments has increased from twenty-four to forty, and coverage has also been added by Medicare and the Department of Veterans Affairs.<sup>19</sup>

■ **Contribution to reducing alcohol-related motor vehicle crashes.** Alcohol-related motor vehicle crashes resulted in more than 16,000 deaths and 300,000 injuries in the United States in 2000. Lowering legal blood alcohol concentration (BAC) for drivers has been proposed as a policy response that might reduce this burden of injury and death. In 2001 a systematic review showed that laws allowing drivers a BAC of 0.08 percent versus 0.1 percent results in a median decrease in fatal alcohol-related motor vehicle crashes of about 7 percent. Based on this review, the task force recommended that this policy be implemented on the basis of sufficient evidence of effectiveness.<sup>20</sup>

This recommendation was influential in Congress’s decision to include incentives (in the form of federal highway construction funds) for states to pass such laws. At the time of the congressional incentives, seventeen states had 0.08 percent BAC laws. By the end of 2004, all fifty states, the District of Columbia, and Puerto Rico had enacted 0.08 percent BAC laws.<sup>21</sup> Although most states had mul-

tiple laws aimed at reducing alcohol-impaired driving, addition of 0.08 laws in the thirty-three states that did not previously have them should save at least 400–600 lives each year and prevent a much larger number of disabling injuries.<sup>22</sup>

■ **Contribution to use of early childhood education programs.** Child development is a powerful determinant of health in adult life, as indicated by the strong relationship in adulthood between level of education and health status. Low socioeconomic status in early life puts children's cognitive and behavioral development at risk. Comprehensive preschool programs for low-income children ages 3–5, can improve readiness for school. A systematic review of published studies, conducted on behalf of the Task Force on Community Preventive Services, found that publicly funded comprehensive early childhood education programs are effective in improving preparedness to learn: Children who participated in these programs are 13 percent less likely to be “held back” in grade level and 14 percent less likely to be placed in special education programs in the future.<sup>23</sup> Based on strong evidence from this review, the task force issued a recommendation that this intervention be implemented. Policymakers have used this information to support their funding decisions. For example, in 2005 the California and Los Angeles First 5 Commissions, which receive tobacco tax revenue funds to improve health and development of children ages 0–5, used this type of evidence in part to support their decision to invest more than \$100 million per year in new preschool classes.<sup>24</sup>

■ **Counterexample: continued use of ineffective drug abuse programs.** Although systematic reviews and evidence-based recommendations are being used to encourage new interventions or expand use of those already in place, the news is less optimistic about use of reviews to encourage decisionmakers to substitute more-effective choices for the less-effective ones that are already in widespread practice. This reflects multiple technical and human challenges: (1) Studies that do not show effectiveness are less likely than those showing effectiveness to be published; (2) proving no effect is inherently difficult, and it is often difficult to rule out the possibility that an intervention could have some effect; and (3) people are often resistant to new information that challenges their preconceptions or interests.

Substance use (including tobacco, alcohol, and illegal drugs) often starts in adolescence and results in serious health consequences. There is widespread social consensus that something should be done, and school-based programs have the potential to reach most adolescents. One particular program, D.A.R.E. (Drug Abuse Resistance Education), is widely used in U.S. schools and costs about three-quarters of a billion dollars annually.<sup>25</sup> However, available good-quality studies and reviews generally show that this program has no or negligible effects on drug use behavior.<sup>26</sup> Given this program's continuing widespread use, reviews have not had a substantial impact on discouraging its use and encouraging substitution of more-effective choices.

■ **Contributions to additional needed research.** An underappreciated benefit of reviews is in helping to assure that new research takes full account of current ar-

areas where we do not yet know enough. Some countries, including the United Kingdom and Denmark, have begun requiring references to systematic reviews before funding new research.<sup>27</sup> In the United States, such requirements do not exist, but the *Guide to Community Preventive Services* is beginning to influence new research: For example, the CDC and the National Institutes of Health (NIH) have together committed \$2.5 million annually to a Cancer Prevention and Control Research Network that provides an infrastructure for filling important gaps in research, many of which were identified in community-guide systematic reviews.<sup>28</sup>

### **Portfolio Of Tools: For Improving Community Fit And Feasibility**

The science base for assuring that an intervention or policy will be appropriate and feasible in particular settings and populations is less developed than the science base for assessing whether something should be done or whether something works generally. However, a range of techniques and tools are evolving in this area. Some of the important ones include the following. (1) Participatory research: performing research in collaboration with those affected by the issue under study for the purpose of taking action or making change has the potential to increase the relevance of research findings and their subsequent use in communities.<sup>29</sup> (2) Increasing collection and reporting of qualitative information about the context in which research studies were conducted will provide users with more information about whether particular strategies are likely to be feasible and useful in local contexts as well as providing a basis for allowing systematic reviews to assess the impact of context on results.<sup>30</sup> (3) Economic evaluations of public health interventions will provide critical information about costs and value. (4) Finally, decision analytic and other modeling approaches can be very helpful in systematically collecting and analyzing available data, comparing the value of two or more decision options, and assessing the importance of uncertainties on results.<sup>31</sup>

### **Concluding Remarks**

Much more can be done to assure that original public health studies and syntheses are available and considered when decisions are needed across a full range of population-oriented interventions. Policymakers can help by assuring adequate funding for both studies and syntheses that fill high-priority gaps in knowledge. They can also promote interactions between themselves and researchers to increase the relevance of the research enterprise to critical policy questions.

When the science base is adequate to support decisions, more can be done to rapidly translate results into decisions on expanding or changing programs and policies designed to improve health. Dissemination of results can be accelerated, tools developed to facilitate their use in a variety of settings, incentives provided for implementing recommended programs and policies based on the best evidence, and results measured.

No evidence-based tool will or should ever constitute the sole base on which a decision rests. High-quality, evidence-based information is not always available, and even when it is, policy choices should always be informed by available resources, community priorities, perceived value, feasibility, culture, and other factors.<sup>32</sup> Evidence-based information will not change strong ideological support for or opposition to policy positions. However, the best available evidence can contribute to carefully vetted, balanced information that can help the open-minded to make better-informed choices.

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*The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.*

## NOTES

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