Commentary

Policy Research for Disease Prevention: Challenges and Practical Recommendations

Ross C. Brownson, PhD, Craig J. Newschaffer, PhD, MS, and Farnoush Ali-Abarghoui, MPH

ABSTRACT

Policy approaches to health promotion and disease prevention hold great potential, as several community-based projects have illustrated. Policy interventions, despite their widespread use, frequently lack a systematic framework for implementation and evaluation.

The authors propose a four-stage framework for the formation and evaluation of public health policy. The stages are identification of health risks and preventive options; intervention development; policy development; and policy enactment and assurance. A strong focus on evaluation is included within the framework. In addition, a series of practical implications and recommendations are given under the broad headings of evaluation issues and linkages. It is hoped that the issues described will lead to more systematic implementation and evaluation of public health policy measures. (*Am J Public Health.* 1997;87:735–739)

> Laws are like sausages. You should never watch them being made.
> —*Honoré Mirabeau,* 1918

Introduction

In recent years, researchers have increasingly recognized the role of health policies and environmental changes in influencing individual health behaviors.[1–7] Policy approaches to disease prevention tend to have a greater impact on the whole community than individually oriented approaches do.[7–9] In the United States, much of the decline in overall mortality since 1900 has been attributed to policy-related improvements in sanitation, water supply, and food quality.[10] More recently, international movements, such as the Victoria Declaration on Heart Health[11] and Healthy Cities/Healthy Communities Movement,[12] are adopting a policy-oriented vision to prevent disease. These programs recognize the need to foster behavior change by removing policy-imposed barriers to good health and enacting policies that encourage healthy behavior. A clear challenge to public health practice is to make policy intervention and research as legitimate as other, more individually oriented approaches.

Policies are "those laws, regulations, formal and informal rules and understandings that are adopted on a collective basis to guide individual and collective behavior."[7(p1207)] Policy interventions are measures that alter or control the legal, social, economic, and physical environment[13] and that are supported by the notion that individuals are strongly influenced by the sociopolitical and cultural environment in which they act. Examples of several common public health policy issues are summarized in Table 1.

Policies have both direct and subtle effects on public health. Direct effects tend to be more measurable and may include risk factor prevalence, disease incidence or prevalence, disability, and mortality. More subtle effects may occur prior to outcome changes. These include changes in social norms, attitudes toward health, or health care–seeking behavior.[14] As noted in the opening quote from Mirabeau, policy-making is seldom a straightforward, systematic process. Rather, it is a blend of science, politics, and common sense.

Despite the recognized importance of policy-making to the health of the public, relatively little attention has been paid to research on the process and effects of public health policies, including the qualitative factors predicting policy implementation and the evaluation of the outcomes resulting from policy measures.

To foster a more systematic approach toward this type of policy research, this paper outlines a framework for the formation and evaluation of public health policy and provides several practical recommendations for public health professionals. The framework can be used to describe the historical development process for existing policies. Perhaps more importantly, individuals who are in

The authors are with the Department of Community Health and Prevention Research Center, School of Public Health, St. Louis University, St. Louis, Mo.

Requests for reprints should be sent to Ross C. Brownson, PhD, Department of Community Health and Prevention Research Center, School of Public Health, St. Louis University, 3663 Lindell Blvd, St. Louis, MO 63108-3342.

TABLE 1—Examples of Public Health Policy Applications, by Level of Prevention

Level of Prevention and Risk Factor	Population	Health Outcome	Policy Intervention	Policy Effectiveness[a]
Primary prevention				
Environmental tobacco smoke	General	Lung cancer, other health conditions	State and local clean indoor air regulations	Moderate
Physical inactivity	Employed adults	Cardiovascular disease	Corporate policies that provide breaks for use of exercise and health club memberships	Untested
Secondary prevention				
Mammography screening	Women	Breast cancer	State and federal laws mandating insurance coverage of mammography	Untested
Screening for congenital disorders	Newborns	Phenylketonuria	State laws mandating screening	High
Tertiary prevention				
Physical frailty	Hospitalized elderly	Falls, other morbidity, mortality	Geriatric assessment unit formation	Equivocal
Rehabilitation services	Stroke patients	Physical function, mortality	Medicare reimbursement	Moderate

[a]Based on the authors' "best estimate."

positions to influence policies can use this framework to develop more comprehensive strategies for public health policy development and evaluation.

Framework for Policy Development and Implementation

We propose a framework of four stages by which research and evaluation can inform policy interventions (Figure 1). While the process of policy development for disease prevention and health promotion seldom conforms to a rigid model, we propose this framework as a basis for conceptualizing the policy process and for conducting research on the development and evaluation of policy interventions. In many aspects, our model generally parallels the overall framework proposed by the Institute of Medicine: assessment, policy development and assurance.[15] Our stages I and II correspond roughly to the Institute of Medicine's definition of assessment.[15] Policy development occurs in stage III, and assurance occurs primarily in stage IV.

Identification of Health Risks and Preventive Options

Health risks have commonly been identified and quantified through epidemiologic and clinical research. Etiologic studies in epidemiology seek to measure the magnitude of an association in terms of an odds ratio or relative risk.[16] The potential causality of a relationship between a given risk factor and a health condition can be assessed with several schemes.[17,18]

As outlined in these causal criteria,[17,18] epidemiologic studies of populations should also have supporting information and evidence from the basic sciences. This may involve biological measurements of a population being studied for health effects (e.g., serum cotinine levels to measure cigarette-smoking status) or information from studies of laboratory animals that supports human findings (e.g., the development of tumors in laboratory mice from the application of cigarette tars).

Intervention Development

Epidemiologic research conducted in stage I can provide the basis for intervention development (stage II). Intervention development typically follows the classic public health model of agent-host-environment (etiologic factors–intrinsic factors–extrinsic factors).[16] In stage II, public health professionals make use of existing research on the health issue of interest, as well as data on priority populations, to determine intervention options. These options may involve a variety of approaches, such as a media campaign to educate the public on a health issue or a clinical intervention by primary care providers. The critical steps are examining the population-attributable risk to determine the potential benefits of public health intervention, determining whether intervention options exist to address the health issue of concern, assessing the most vulnerable or highest risk populations, and selecting a model of behavior that addresses the issue.

During stage II, a population-based or high-risk[19] strategy is considered. For many public health issues, a general population-based approach has several advantages. The common risk factors for many diseases are present in a large proportion of the population, and therefore, most of the cases of disease arise from the intermediate- and low-risk groups. Relatively small changes in risk among the middle-risk group can result in a greater overall reduction in disease burden than do greater changes in the high-risk group.[8] In practice, population-based and high-risk approaches are often combined. Within our proposed framework, a high-risk approach would be more likely to occur in stage II, whereas a population approach would be more likely in stages III and IV (i.e., a population approach may evolve from a high-risk approach). Once an intervention approach has been determined, the process ideally moves toward evaluation (arrow 1 in Figure 1).

Policy Development

After evaluation identifies a potentially effective behavioral intervention within a defined population, the process moves toward development of policy interventions that will affect a larger population (arrow 2). Moving from stage II to III typically involves the transition

from research and individually focused applications to interventions involving public health policy. As illustrated in Figure 1, intervention options may be ineffective (arrow 3) and, therefore, the process may move back to stage II (arrow 4) to develop a more effective strategy. Frequently, an intervention moves from stage II to stage III with little focus on evaluation (arrow 5). As options are being assessed, cost-effectiveness or cost-benefit analysis can be useful in setting priorities among a set of options.

Community action may hold the greatest potential for changing health policies.[20] Community coalitions frequently are formed to refine policy approaches and to engender support among policymakers and the general public. A coalition is a group of people and/or organizations working together for a common goal. An effective coalition has much more power to influence policy than any single member group does.

It is beneficial to involve policymakers in the early deliberations regarding policy options. Supportive policymakers can provide advice on timing, methods for framing the issue, strategies for identifying sponsors, and the developing of support among the general public. During the policy-assessment stage, several additional "environmental" conditions should be considered: how and by whom the policy should be implemented, indicators of success (sources of evaluation), and, if necessary, how the policy should be reformulated.[21] During stage III, policy-planning data can be extremely beneficial. Such data may include cross-sectional surveys. For example, one might poll the voting public to measure support for a public health issue (e.g., raising the alcohol excise tax).

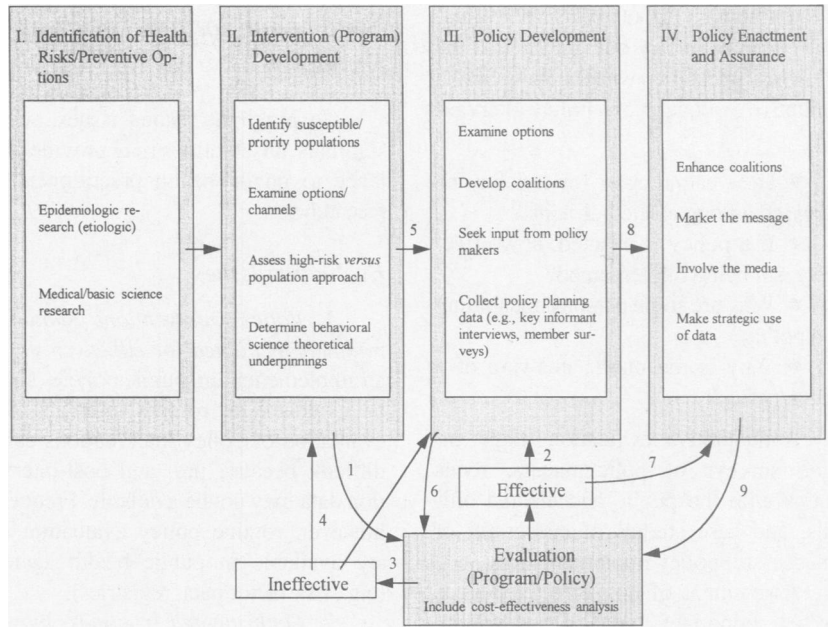

FIGURE 1—Four-stage framework for public health policy development and evaluation.

Policy Enactment and Assurance

In stage IV, the primary focus is on building widespread support for a prevention-oriented, effective health policy and ensuring it is enacted in a timely manner. Ideally, a proposed policy is evaluated for potential effectiveness (arrow 6), and if effectiveness is likely, enactment and assurance proceed (arrow 7). This is frequently accomplished through a coalition of health professionals, policymakers, and community members. If a coalition is engaged in a legislative campaign, obtaining the services of an effective lobbyist may also be necessary. All too frequently, a health policy moves quickly from stage III to stage IV (arrow 8) with little attention paid to evaluation prior to widespread implementation. Coalition formation is frequently, but not always, critical for policy enactment. In some cases, support from a single, key individual within a legislative body (e.g., a committee chair) may be sufficient for passage of a health policy. Similarly, organizational policies (e.g., implementing a worksite health promotion program) may be enacted by a single individual (commonly the chief executive officer of the company).

Community coalitions often progress through dynamic stages that include mobilization, establishing structures, building capacity, planning for action, implementation, refinement, and institutionalization.[22] As community-based programs progress, more "late adopters" may be present in the target groups and a larger focus on policy interventions becomes necessary.[7]

Actively involving the media in the debate about a health policy issue can greatly benefit enactment. Strategic use of the mass media, so-called "media advocacy," can be accomplished in three steps: setting the agenda, shaping the debate, and advancing the policy.[23] The effective use of data, or "creative epidemiology," is crucial in communicating information to the media. Creative epidemiology is simply a method of making data interesting to the media and the general public. It blends the science of the researcher with the creativity of the advocate.[24]

The Evaluation Loop

A critical aspect of our four-stage policy development framework is the evaluation loop (Figure 1). Previously, Tugwell et al.[25] described an "iterative loop" to assess the overall effectiveness of health services. Our evaluation builds on this approach while considering evaluation issues particularly relevant to public health policy research. Evaluation of public health policies should follow the same design considerations as program evaluation, including internal validity, external validity, and reliability.[26,27] However, health policy evaluation can be more challenging because individual randomization is seldom possible and it is difficult, if not impossible, to control policy evaluation "experimental conditions."

Optimally, evaluation of effectiveness should occur between stages II and III, and cost-effectiveness analysis should occur in stage III. Following stage IV, a policy that presumably affects some aspect of the population's health is enacted. Macro-level evaluation should continue to monitor the effects of a particular policy on the health of the population (arrow 9 in Figure 1).

Qualitative evaluation can be a useful complement to quantitative evaluation.[28] For example, one might ask the following questions when conducting a qualitative evaluation of a policy intervention:

- How can support for a policy be increased among elected officials?
- If a policy is enacted, how effectively is it being implemented?
- Why are some persons not abiding by a policy?
- Why is the public unaware of a certain policy?

A qualitative evaluation might include surveys of policymakers, focus groups with the public and elected officials, and case studies of successful or unsuccessful policy implementation.

Assessment of cost-effectiveness is another important type of evaluation. Typically, our society has been willing to accept medical and surgical interventions to treat existing diseases with relatively little attention to cost-effectiveness, whereas, in many cases, prevention efforts have been held to a higher standard in needing to demonstrate cost-effectiveness prior to widespread application.[3,29] Cost-effectiveness analysis is the most commonly conducted economic analysis for health programs.[30] It is especially useful when the goal is to identify the most cost-effective prevention strategy among a number of options. Since the calculation of cost-effectiveness relies first on the determination of effectiveness,[3] cost-effectiveness of some health policy interventions is challenging because clear demonstration of effectiveness may be more difficult than for traditional medical interventions (e.g., use of a therapeutic drug).

Summary

The approach to public health policy development outlined in Figure 1 is our ideal design. In real-world circumstances, such a logical and comprehensive approach is not always realistic or possible. In many circumstances, public health policy development may move directly from stage I to stage III, and the evaluation of policy alternatives may only occur after the fact. Our framework argues that people involved in epidemiologic research, behavioral science, and public health advocacy should consider systematic implementation and evaluation of policy initiatives.

Practical Implications and Recommendations for Policy Research

To highlight related issues, several summary observations may provide assistance to public health practitioners and researchers.

Evaluation Issues

1. *Policy interventions should be routinely evaluated for effectiveness.* After implementation, public policies should be evaluated at routine intervals. Such evaluation of policy interventions can be difficult because pre- and post-intervention data may not be available. Frequently however, routine policy evaluation data are available in public health agencies (e.g., risk factor data, registries).

2. *Sophisticated methods may be needed for evaluation of policy interventions.* Like community-based risk-reduction trials,[31] policy interventions will commonly involve analysis at the community rather than the individual level. Therefore, appropriate sampling and analytic techniques that account for intraclass correlations should be used.[32,33]

3. *Policy interventions, especially those addressing primary prevention, may benefit from cost-effectiveness analysis.* As described in the earlier sections, cost-effectiveness analysis can be an important tool for helping to assess the relative appropriateness of policy initiatives. In an era of scarce public resources, difficult choices between various intervention strategies are necessary.

4. *Measurement of "environmental indicators"[13] may assist in overall policy evaluation.* In addition to individual-level evaluation, measurement of changes in the community environment may assist in evaluation of policy initiatives. For example, when measuring smoking-related behavior, one might wish to collect information on the proportion of restaurants or worksites with no-smoking policies, the satisfaction of corporate executives with no-smoking policies, or the receptivity of legislative "key informants" to passing a particular policy.

5. *Policy researchers must balance scientific rigor with the need for public health action.* Public health action through policy implementation cannot always await the accumulation of scientific evidence and consensus among scientists.[34] A continuing difficulty for policy researchers will be determining the point at which the weight of scientific evidence calls for policy intervention.[8,35]

Linkages

1. *Policy research can support a productive partnership between academics and public health practitioners.* Academic researchers can be isolated from the policy-making process and may lack practical knowledge of policy implementation. Conversely, professionals in public health agencies may lack the time or motivation to conduct public health policy research. Policy research efforts can be enhanced through a blending of complementary skills and disciplines and is an ideal area for academic-practice linkages.[36]

2. *Policy implementation and evaluation is a responsibility shared between scientists and policymakers.* While there are legitimate reasons for scientists to maintain some level of isolation from the policy-making process,[37] we view policy implementation and research as a responsibility shared between science and policymakers. In the absence of scientists' involvement in the policy-making process, policymakers are likely to rely more heavily on vested interests (e.g., the tobacco industry), which may not have the public's health as their primary motivation.

3. *Policy research at the community level must balance the needs of the community with those of the researchers.* Because of potential tensions between researchers and the surrounding community as well as their differing goals,[38,39] the community projects that are most successful are those that are true "partnerships" between academic researchers and community leaders.[40] Through careful planning, shared goal setting, and systematic implementation, it is possible to meet the health needs defined by the community without compromising a rigorous study design.

Conclusions

It is difficult to change individual behaviors that put people at high risk for numerous diseases.[41] Changing the surrounding policy environment may be more efficient and practical than one-to-one programs. For successful implementation and evaluation of policy measures, a solid basis in science is needed along with skills in public health advocacy. □

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