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Commentary

From Public Health Science to Prevention Policy: Placing Science in Its Social and Political Contexts

Katharine Atwood, MS, Graham A. Colditz, DrPH, MB, and Ichiro Kawachi, MD, PhD

Introduction

By what process does public health knowledge become translated into preventive action? On several occasions in history, successful action has been taken to avert major outbreaks, even though a complete understanding of pathogenesis may have been lacking. An example is the prevention of scurvy with lemon juice in the British Admiralty fleet. (A sailor on Captain Cook's voyages in the South Pacific remarked on how the captain raised "spirit amongst us by his example, for scarcely anything came wrong to him that was Green and he was as careful in providing Vegetables for the Messes of the crews as for his own table and I do believe that in this means consisted his grand art of preserving his people in health."[1]) More often, though, preventive action seems to lag behind the state of public health science. For instance, more than 30 years after the first surgeon general's report on the health consequences of smoking[2]—and 7 years after the surgeon general's determination that nicotine is an addictive substance[3]—policymakers are only now beginning to move to regulate cigarettes as a nicotine delivery device.[4]

Undoubtedly, underinvestment in prevention remains the major impediment to effective public health action. Nine preventable conditions are responsible for more than 50% of all deaths in the United States.[5] Yet, of the total amount spent nationwide each year on health care, less than 5% is spent on health promotion and disease prevention.[6] As of 1993, Medicare paid for only 4 of the 44 preventive services recommended by the US Preventive Services Task Force.[7] But lack of investment in prevention is only a symptom of the underlying inertia that blocks effective translation of knowledge into action. To understand why preventive action fails to materialize even in the presence of sufficient knowledge, we need to pay heed to the interdependence of science with the social and political dimensions of public health.[8] The health policy model devised by Richmond and Kotelchuck (Figure 1)[9] posits that there are three necessary ingredients that make prevention happen: the knowledge base; the political will to support change (and generate resources to produce change); and a social strategy to accomplish change.[9] Analogous to Rothman's now-classic model of causation in epidemiology,[10,11] all three components of the pie must be present in some degree for preventive action to proceed.

The usefulness of Richmond and Kotelchuck's model consists in placing public health science within its social and political context, thereby helping us not only to explain why certain programs have met with success in the past but also to predict why other programs are bound to fail. Using contrasting examples from the areas of tobacco control and promotion of physical activity, we attempt to illustrate some implications of Richmond and Kotelchuck's model.

Conceptual Framework of the Richmond–Kotelchuck Model

The Knowledge Base

The first component of Richmond and Kotelchuck's model is the knowledge

Katharine Atwood and Ichiro Kawachi are with the Department of Health and Social Behavior, Harvard School of Public Health, Boston, Mass. Graham A. Colditz is with Channing Laboratory, Harvard Medical School and Brigham and Women's Hospital, Boston.

Requests for reprints should be sent to Graham A. Colditz, DrPH, MB, Channing Laboratory, 181 Longwood Ave, Boston, MA 02115.

Source. Adapted from Richmond and Kotelchuck, by permission of Oxford University Press.[9]

FIGURE 1—Richmond and Kotelchuck's health policy model.

base, defined as "the scientific and administrative data base upon which to make decisions."[9] It is within this component that public health researchers most concentrate their efforts. Although a substantial epidemiologic literature exists on the criteria for making causal judgments,[2,12,13] much less attention has been paid to the question of how knowledge becomes translated into action. Indeed, some would maintain that epidemiologic research ought to remain separate from the process of policy formulation.[14,15] According to one such view, "the conduct of science should be guided by the pursuit of explanation of natural phenomena, not the attainment of political or social objectives. Policies are set by a political balancing (or unbalancing) that uses science without being beholden to it."[14]

However, understanding how we conduct public health research may be as crucial to the implementation of preventive policies as understanding disease etiology and pathogenesis. As pointed out by Krieger, the stated objectivity of science affects what data are collected, what questions are asked, and what actions are taken.[16] The very decision to isolate science from its social and political context is, in itself, a political decision made to maintain the authority of scientific investigation (A. Brandt, oral communication, August 1995). A series of thoughtful essays in a recent issue of the Journal[17,18] and elsewhere[19,20] suggests that the way in which we carry out public health research—epidemiology in particular—is as much to blame for our inability to translate scientific knowledge into action as any other cause, including lack of resources. Recent critiques of epidemiologic research and teaching have warned against the increasing emphasis on technical and methodological sophistication to the neglect of the broader mission of public health, much in the same way that economics, which began as an essentially moral endeavor (it was part of the Moral Sciences Tripos at Cambridge in Keynes's day), gradually evolved to become a highly technical discipline with diminishing relevance to the problems of society.[21]

An example of what happens when scientific rigor outstrips social relevance was witnessed in the tobacco control area when a 4-year, 22-city study was undertaken in pursuit of the ultimate standard of proof (viz., a randomized trial demonstration) that smoking cessation campaigns are worthwhile. As it turned out, the Community Intervention Trial for Smoking Cessation yielded rather modest results, despite the time and cost expended. There was no difference in quit rates among heavy smokers (18.0% in the intervention vs 18.7% in the control communities) and only a modest benefit for light-to-moderate smokers (30.6% vs 27.5%).[22] Scarce resources were thus allocated to a randomized control trial that, on the face of it, provided slim encouragement for large-scale behavioral intervention.

None of this is to imply nihilism over the randomized trial approach. Indeed, trials often form an indispensable part of the knowledge base. But in the case of a well-documented problem such as nicotine addiction, it could be argued that what public health needed was not a randomized trial of smoking cessation but a dose of political will to put an end to the tobacco epidemic.

Political Will

Political will is defined as society's desire and commitment to develop and fund new programs or to support or modify existing programs.[9] The process by which political will becomes mobilized is not clearly understood, but it seems to depend on both supply side factors (what influences the behavior of politicians and legislators) and demand side factors (the participation of citizens in political activities). Unfortunately, we seem to understand more about what leads to the failure of political will than how to successfully build political will. On the supply side, political scientists have warned how campaign financing threatens to distort the processes of representative democracy. In the lead-up to the 1996 elections, after President Clinton vowed to crack down on cigarettes, the two major manufacturers doubled their donations to the Republican Party: Philip Morris donated $1.6 million, and RJR Nabisco donated $970 000. On the demand side of political will, grass-roots action has been one mechanism by which politically active citizens have generated political will. Through activities such as coalition building, contacting politicians, and organizing petitions and referenda, citizens have sought to influence what government does. Political participation provides the mechanism by which communities ave voiced their needs and preferences and generated pressure on politicians to respond by providing resources. There have been some notable instances of success, such as Proposition 99 in California and the Massachusetts Tobacco Control program, in which sufficient political will was garnered to launch major tobacco control initiatives. However, even in these cases, the effectiveness of the programs is constantly under threat by politicians who have sought to redirect tobacco control funds to other uses.

Political will is thus as critical to the success of preventive programs as is nsuring an adequate knowledge base. Scientific knowledge and political will are clearly interdependent (Figure 1): new knowledge creates political will, and vice versa. Yet disproportionate emphasis in public health has been directed toward evaluating the adequacy of scientific knowledge, as if that were sufficient for preventive action to proceed. To disregard the role of political will is to risk social irrelevance. One consequence of the disjunction between science and politics is that the magnitude of risk posed by a public health problem often bears little relation to the amount of political will (and resources) generated by the issue. Tobacco is responsible for 30% of all cancer deaths, while 5% to 10% can be linked to inherited genetic causes.[23] Yet the tobacco control budget of the National Cancer Institute (NCI) amounted to $60 million in 1996 (D. Shopland, NCI, oral communication, September 1995), as compared with the multibillion-dollar research project under way to sequence the human genome.

Social Strategy

The final component of Richmond and Kotelchuck's model is social strategy, which has been defined as "the plan by which we apply our knowledge base and

political will to improve or initiate programs."[9] The social strategy is a blueprint for goals and how to reach them.[8] Three components of the social strategy were recognized: preventive services delivered by health care providers to patients, structural interventions implemented by government and industry, and local activities that promote a healthier environment and lifestyle.[9] This strategy was initiated in 1979 with the publication of *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention,* which set quantitative health goals for the nation for the first time.[24] This report was published when Dr Richmond, as surgeon general, was developing his model for health policy (Dr J. Richmond, oral communication, September 1995). *Healthy People 2000,* published in 1991, further demonstrated how national social strategy could be developed to pursue health promotion and disease prevention.[25]

In the area of tobacco control, there is no dearth of social strategies (e.g., as outlined in recent proposals unveiled by the FDA[26]). In contrast, the example of promoting physical activity demonstrates how—despite sufficient scientific evidence and even a modicum of political will—preventive action may still fail to materialize because of the absence of a viable social strategy. The latest surgeon general's report concluded that moderate physical activity is associated with prevention of a wide variety of chronic diseases.[27] The problem is that one out of four Americans report no physical activity during their past-month leisure time, and only 22% of adults meet the year 2000 objective of engaging in light-to-moderate physical activity for at least 30 minutes five times a week.[27] In light of these figures, the US Preventive Services Task Force has recommended that physicians routinely counsel patients to increase physical activity.[28] Such advice is strongly associated with increased levels of exercise.[29] In the absence of a national strategy (including financial incentives) to ensure that physicians actually deliver such advice to their patients, however, it is highly unlikely that the task force recommendations will be implemented.

At the community level, urban planning decisions have often gone unrecognized as a powerful strategy for shifting the levels of physical activity in the population. Zoning laws and town ordinances can help to prevent the spread of strip malls that encourage driving rather than walking to shopping areas.[30] At relatively low cost, Dayton, Ohio, has restructured streets with cul-de-sacs to reduce traffic in populated areas, increasing access to safe play areas.[31] In office buildings, greater access to stairs can increase the likelihood that they are used. The power of social strategies is that they may reset behavioral norms in the long run, thereby leading to sustained population change. The challenge for public health is to venture beyond the scientific evidence to identify which strategies are likely to pay off in terms of lasting behavior change.

Conclusion

The value of Richmond and Kotelchuck's model lies in its explicit acknowledgment of the interdependencies between public health knowledge, political will, and social strategies. No single component suffices to produce effective preventive action. Deliberating on health policy in the absence of any one of these components is like trying to balance on a two-legged stool. Recent debates rethinking the aims of public health science—epidemiology in particular[17,18]—represent laudable attempts to return to the fundamental mission of public health, namely preventive action. Yet, as the Richmond–Kotelchuck model suggests, prevention consists of something more than adequate scientific standards of proof; the model provides a conceptual road map for shaping policy. □

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