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Adaptation of Behavioral Theory to CDC's HIV Prevention Research: Experience at the Centers for Disease Control and Prevention

This volume contains a series of studies that describe how behavioral scientists at the Centers for Disease Control and Prevention (CDC) worked with public health practitioners to integrate behavioral science theory into public health practice. This integration has evolved since 1988 as researchers gained information about populations at risk, examined data reflecting the operation of the behavioral theories, and revised practices on the basis of experience. Fishbein (1) has outlined the elements of these behavioral theories and the need to apply them to HIV prevention. The purpose of this editorial is to present the history of this evolution and to illustrate the application of behavioral theory to particular settings, populations at risk, organizational capabilities, and available resources.

Applying behavioral theory and knowledge to HIV prevention is a complex process. If it were simple, a greater number of effective prevention models—or even promising models—would have emerged (2). The methodologies to determine the effectiveness of prevention measures are slowly evolving, and the field faces special research problems. Problems of internal validity—establishing the causal relationship between interventions and behavior change—are well discussed, though not resolved. These include (a) the need to study populations at risk, such as injection drug users and runaway teens, that are not easy to find at a health facility or engage there; (b) an extensive time frame to reveal effects of intervention; and (c) a continuing reliance on self-report as the only measure of behavior change that is consistently available, but can seldom be validated (3).

In addition, HIV prevention research faces the challenge of external validity: the degree to which findings can be generalized. Cronbach (4) describes two very distinct forms of external validity that bear on the topic at hand. For policy makers, the primary generalization issue is whether behavioral applications are effective overall, because they have to decide where to put the effort and resources for HIV prevention. In contrast, public health practitioners want to know whether the application is likely to work specifically in the communities for which they have responsibility. Cronbach (4) notes that although research on effectiveness is retrospective (analysis comes after intervention), the question of generalization is prospective. For HIV prevention, the public health practitioner asks a future-oriented question: "Will the applications of behavioral theory be effective in my community, with the available resources and personnel?"

Behavior Theory and Technology Transfer

The public health practitioner's question, "Will it work in my setting?" is becoming urgent. CDC's community planning process (5) allocates funding based on deliberations about local needs and priorities for HIV prevention. The process requires that communities and public health practitioners work with theories and methods on issues they may never have faced before. Local planners will need to examine critically the available evidence and make some decisions about applicability to their situations before committing resources to particular prevention approaches.

If experience from other policy sectors holds true, public health practitioners are likely to shop for HIV prevention methods once they have set priorities among target groups for prevention. Practitioners will select from among the available approaches, based on their own informal assessment of (a) the fit between the approaches and the local organization capability, (b) the acceptability of the methods to their funders, decision makers, the public, and the target group; and (c) the feasibility of local implementation. Practitioners tend to adopt program elements as well as entire program types (6). Using the approaches described in this volume, practitioners may adopt the element of peer volunteer networks (7-9), but they may reject the element of paid outreach workers (7, 10) as not feasible given budget constraints. They may accept the concept of role model stories based on the stages of change (7, 8), but reject stage-based counseling by paraprofessionals (9, 11) due to a lack of supervisory staff.

Experience to date indicates that throughout this process, practitioners attempt to anticipate which program elements will prove effective in the new setting and situation, with the new population (4, 6). Then they often adapt the elements to be relevant and meaningful in the new environment. To some extent, this is the process that evolved for CDC HIV prevention studies. When the AIDS Community Demonstration Projects started, very little information about the specific adaptation of behavioral theories to HIV prevention was available. Only through a process of experience and study did CDC refine and adapt implementation to the specific sites and populations. For example, role model stories are designed to move people forward through the stages of change (8). However, role model stories devel-

oped in Denver are not necessarily appropriate for Philadelphia—new stories with local language, situations, and characters were required.

Throughout the process of planning interventions, selecting from available options, and adapting interventions to local circumstances, public health practitioners are likely to be uncomfortable. In a real sense, they are venturing into

the unknown. The same uncertainties held true in the development of CDC's HIV prevention approaches. There is always uncertainty, about both the adoption of project elements and the appropriateness of their adaptation to local circumstances. Theory is particularly helpful for the prospective question, "Will it work here?" Theories are general statements of principles about how behavior develops and changes. Part of the training of the behavioral scientist is to (a) make predictions about behavior in specific circumstances; (b) translate overall theoretical concepts into specific implementation; and

(c) establish criteria so that other professionals can agree as to whether the specific implementation is an appropriate example of the overall concept.

Behavioral scientists have noted that public health practitioners may seem uncomfortable or awkward in translating behavioral theory to specific applications (12). The practitioner is often more comfortable when specific concrete examples can be discussed and critiqued. The papers in this volume illustrate some of the possible applications. They discuss more formal strategies for applying theory in new settings. Finally, they illustrate how the knowledge base of the public health practitioner is vital to making the process work.

Development of CDC HIV Prevention Models

Figure 1 outlines the process whereby behavioral theories were integrated with practice in CDC prevention research. Investigators began with a body of empirical knowledge about HIV risk behaviors and about behavioral theories that might apply to these risk behaviors. Initially, the theories had not been applied to HIV prevention, but had been extensively applied to other health-related behaviors, such as smoking (13, 14), heart disease (15) and cancer control (16). Based on these two knowledge bases, a tentative, eclectic theory of HIV risk behaviors and their prevention was developed and refined. The reason to develop the eclectic theory of risk behaviors was to develop a general strategy for intervention. The distinction between a theory

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of risk behaviors and a general strategy to change those behaviors is important. Both are more general statements about forces at work on behavior; however, the theory permits insights about the forces at work, whereas the strategy tells us what is appropriate for implementation at different sites and with different populations at risk.

Based on the tentative theory, practitioners and behavioral scientists shaped interventions specific to the target populations and sites. In this process, specific kinds of knowledge about the target population were used. One source of knowledge was public health practice, since some of the issues in program implementation had been faced before for other public health problems. Such concepts as outreach and counseling, described subsequently, have a substantial tradition in public health practice and related fields. Other sources of information included epidemiologic surveillance and assessment and research literature that discussed and explored the forces at work in the target population. For information specific to a target community, ethnography and other qualitative research methods were employed.

As implementation proceeded, specific information provided feedback to both the tentative, eclectic theory of HIV risk behaviors and the researcher or practitioner's knowledge about the target populations. This information included the following:

1. **Program experience:** Exactly how did project elements work in various sites and cities, and how did they have to be adapted to local conditions?
2. **Process and impact evaluation:** How much effort was expended? Was the intervention appropriate to the setting? Do measures indicate that specific intermediate objectives were achieved, such as changes in knowledge, attitudes, and skills for self-change?
3. **Outcome evaluation:** What were the effects on reducing risky behaviors? What was the response (outcome) given the dose (effort)? Synthesizing this information from many sites, approaches, and measurements, what is known about what works for HIV prevention, with whom, and in what circumstances?

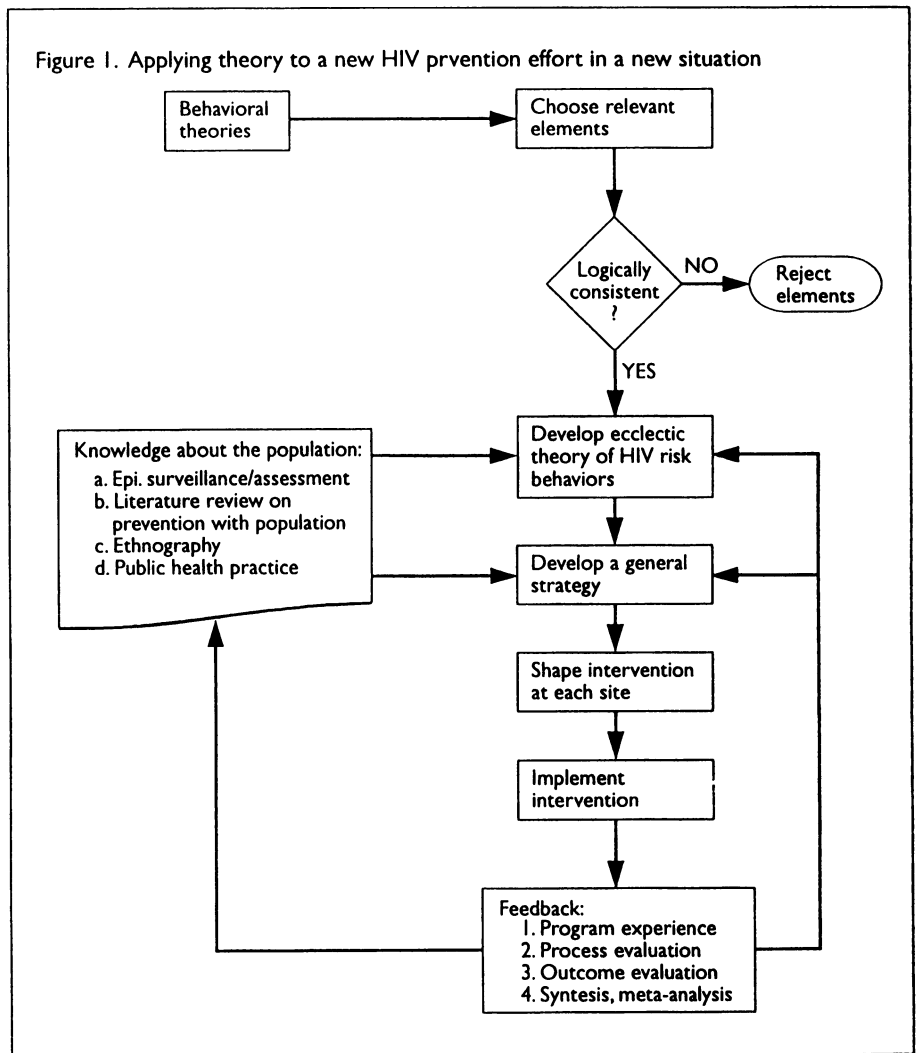
CDC's HIV prevention strategy continues to be refined as the sites implementing the general strategy gain experi-

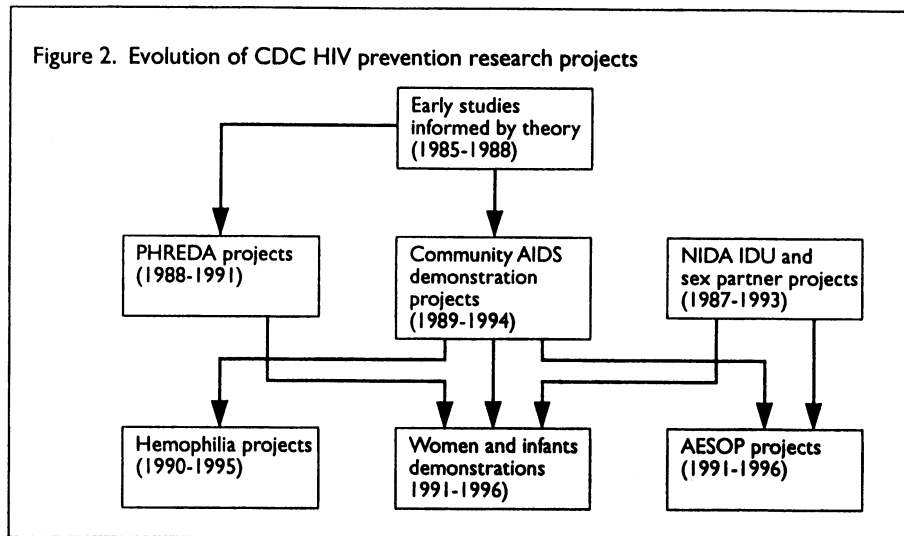
ence and information. In addition, the eclectic theory is enriched with new information. Eventually, a middle range theory of HIV risk behavior and risk reduction can be developed in this manner. Theories of the middle range (17) differ from the grand and all-encompassing theories of health behavior (1) in that they focus on a specific issue such as HIV prevention and incorporate relevant information about the population and the situation, but still make formal generalizations about behavior.

Development of CDC's HIV Prevention Theory

In fall of 1988, planning began for the newly funded AIDS Community Demonstration Projects (1, 7-8, 18-21). Although theory-based HIV interventions were ongoing (22, 23), they were the exception to the rule (24). The Community Demonstration Projects developed a tentative theory that has been refined and utilized ever since.

CDC staff and grantees convened a meeting of external experts to help guide the development of the demonstration projects. Although most of these advisors had not conducted studies of HIV prevention at that time, they repre-





Sources: CDC Project Staff

sented expertise in behavioral theory, social networks, evaluation of health and social programs, qualitative research, communication, and community-level intervention. Based on this conference, an eclectic theory was developed applying the theories described by Fishbein (1), also incorporating elements from communications theory and theories of community organization and development. The Stages of Change (25) were incorporated slightly later. The Stages of Change model offered two advantages for program design: (a) it provided a basis for development and structure of intervention; and (b) it was a framework for moving from intentions to behavior that public health practitioners could relate to their own experience in attempting to bring about change. It also offered several advantages for research and measurement. First, it promised a more sensitive measure of behavior change in individuals and at the community level as well, and second, it provided a method for measuring outcomes as a continuum (more reflective of the way people actually change lifestyle) rather than "all-or-none" self-reported condom use.

The eclectic HIV prevention theory was important because it provided a framework for operations, the outline of the general strategy CDC has used ever since. An overall framework is important in behavioral interventions because it gives focus and coherence to the use of techniques derived from the theories. Too often, efforts at behavior change or lifestyle change have "thrown in the kitchen sink," employing any and every technique that might be effective (26). One problem with "kitchen sink" programs is that the grouped techniques are not coherent and may even be contradictory and self-defeating. Also, any given technique may not be the active ingredient that makes it work (24). Since every component will have a marginal cost (27), it may not be cost-effective to add techniques that are not derived from the theory.

Ideally, the techniques derived from the theory all work

together so that the whole is greater than the sum of the parts. Synergy of effects has been the chief aim of the community demonstrations, and subsequently for the others listed in Figure 2. Examples of synergy can be found throughout this volume, although the articles focus primarily on one or another of the activities that make for synergy. Let us take as an example the situation of a woman attempting consistent condom use with her main partner (preparation stage of change). From role model stories and contact with networkers or outreach workers, she has learned specific skills to negotiate condom use; she succeeds on several occasions; success increases her

perception that she is capable of consistently using condoms; community and outreach worker support for self-protection reinforces the newly adopted behavior pattern; specific role model stories encourage maintenance; and eventually a change in perceived community norms is expected to promote health.

Figure 2 illustrates how prior program experience influenced the development of later efforts. For example, the early findings of the community demonstrations have shaped the AESOP project (10), a set of demonstrations for people with hemophilia, and the Women and Infants Demonstration Projects (WIDP)(9, 11). AESOP, which addressed HIV prevention for injection drug users (IDUs), was also influenced by early findings of projects sponsored by the National Institute on Drug Abuse, which studied street outreach and education for HIV prevention among IDUs (28). The WIDP (9, 11) was also influenced by the prior IDU research, and by earlier research funded in 1988, the Perinatal HIV Reduction and Education Demonstration Activities, which revealed some of the major constraints and motivators in women's self-protection (29-31).

Putting Flesh on the Theoretical Bones

Theory provides structure for these projects, but translating theory to intervention demands a systematic application for which methods are only in the developmental stage (19). In this section, we will focus on qualitative data collection as a technique for making application systematic.

Whenever professionals design a health promotion project, it is best for them to assume they do not fully understand the population at risk. Even in those cases in which practitioners think they know the population, even when practitioners feel they are part of the culture, certain of their beliefs may be incorrect or actively harmful. Neither insiders nor outsiders fully understand the situation because of limi-

tations of their experience. For this reason, formative research aims to include both the insider and outsider perspectives.

The qualitative methods used in CDC demonstrations helped to ensure a relevant translation of the theoretical concepts. They also gave information about how to gain access to social networks, the content of role model stories for particular audiences, identifying the gatekeepers to the communities, and other forms of influence. Both ethnography and focus groups can be used for this purpose, although when little is known about the communities, ethnography can be more informative. On the other hand, rapid ethnographic techniques are highly focused, labor intensive, and costly. Unlike other ethnographies, they must lead to a specific product on a timely basis. This goal was not easily attained (32).

As described in the paper by Higgins, et al. (33), the very process of gathering the qualitative information can serve as organizational development for agencies that are not actively involved in affected communities. Discoveries shared with agency staff on an ongoing basis sensitize staff to street issues. In the words of one family planning agency head, qualitative data collection educated his staff about a population they had not reached for services. It educated the agency about what it would take to serve those women, and about community supports upon which the agency could draw to serve them better. In this sense, the qualitative data collection served to build agency infrastructure by taking the agency beyond its current experience.

Public health practitioners who apply theory and specific strategies to HIV prevention in their own sites can benefit from qualitative data gathering at the planning stage. They are likely to learn something new, and the exercise is helpful for ensuring that the methods are adapted after sufficient thought is given to their relevance to the groups at risk and to the fit with public health practice.

Public Health Practice in Communities

The final source of information in shaping interventions is the knowledge base of service providers. Public health practitioners have substantial experience upon which to draw in adopting and adapting behavioral theory, as well as the specific approaches described in this volume. Public health agencies currently conduct outreach activities, interact with community leaders, hold town meetings to discuss community concerns, develop health education materials, and have staff who visit people in their communities for various purposes. Some make use of community volunteers and paraprofessionals for certain roles. STD officers who climb

tenement stairs, home visitors for maternal and child care, and staff who seek out tuberculosis patients to make sure they take their medication are all engaging in practice relevant to the CDC's HIV prevention theory.

So what is new about these demonstrations? First, they

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engage target populations on different levels than the usual patient-professional encounter. It is in this area that the greatest departure from usual practice is seen. Public health practitioners involved in HIV and STD work do not commonly make use of positive role models for specific behaviors, focus attention on community norms, or teach social skills

for self-protection. These ideas are starting to be more common in other areas of public health practice, in particular for preventing smoking and substance abuse among youth (34, 35).

Also, the demonstrations engage the communities' leadership and resources in a different way. To implement these ideas in some settings, health practitioners must rely on members of the affected communities to gain access to the population and convey the messages. Either the project will have to hire paraprofessional counselors (7, 10, 11, 19, 21), get members of social networks to volunteer their time (7, 19, 21), or create a community mobilization that allows many different supports and participants (9). Some public health practitioners will have experience with one or more of these project elements, given past implementation of the Planned Approach to Community Health (PATCH) (36), the Assessment Protocol for Excellence in Public Health (APEX-PH) (37), community development for rat control (38), the Neighborhood Health Centers movement (39), and other community-based efforts. Public health practitioners can best assess their degree of comfort and expertise in implementing these elements. The innovations should be attempted only if there is a prospect of doing them well.

As many public health practitioners know, there is a difference between placing staff in the community and having a community-based program. A community base usually means that community members have had extensive input to planning, design, and implementation, and they may choose the focus (40). Clearly, this is the goal of the Community Planning Process. As McAlister (15) points out, however, professionals do not have to cede control to communities in order to employ the methods of community development and community organization. From the beginning, staff need to set forth the limits of community involvement in theory-driven prevention projects (41).

Community development is a concept that historically has been linked to public health practice, and it provides a framework for community participation dating at least from

the days of the War on Poverty. It gives us some specific insights on community mobilization of which modern-day practitioners should be aware. First, not all mobilizations should be expected to be equally good. Cotton and Person (9) describe an ideal process in their description of community mobilization for HIV prevention. However, they would be the first to admit that there are some bumps in the road. Some conflict may be a healthy expression, and some irrelevance is inevitable. However, communities usually have many kinds of leaders and associations with which to work (42). If professionals approach the communities in a spirit of partnership and with knowledge of the sensitivities of the leadership, at least some of the community organizations will be willing to pitch in. In areas of high unemployment, hiring community residents is usually appreciated and gives the project ongoing feedback from the community's perspective.

The articles in this volume also describe what it takes to work with community members in an effective way. The history of community development, and in particular the history of the Neighborhood Health Centers movement, tells us about the support required for outreach staff, paraprofessional counselors, and volunteer networkers. Paraprofessional counselors and outreach workers can implement prevention activities, but like anyone else, they need supervision. As entry-level staff from disenfranchised communities, paraprofessionals also need special orientation about service and agency issues (43). Guenther-Gray and her colleagues (7, 19) described the variety of activities required to maintain the interest of volunteers. A personal relationship with staff, picnics, recognition plaques, and other tokens are not simply nice things to do. They are needed to maintain engagement. Note the difficulty reported in the paper by Simons, et al. (21) in maintaining personal contact with a very large community network.

The effectiveness of paraprofessionals is not a foregone conclusion (10, 11). It is a matter of active debate in a society that has placed great emphasis on professional identity and certification (44). Few studies have ever evaluated the effectiveness of paraprofessionals in implementing prevention efforts—a very modest few dating from the beginning of the Neighborhood Health Centers movement (39, 45). The paper by Cabral, et al. (11), which concludes that paraprofessionals can correctly implement a theory-driven intervention, becomes more significant in light of this debate.

Many seasoned public health professionals will recognize the terms and concepts used in this section. Although they may require the help of behavioral scientists or qualitative researchers to put the theory into practice, their own knowledge base clearly is also essential to good implementation of the concepts.

Conclusion

Appropriate adaptation of theory to HIV prevention has required a process of examination and reexamination, using the various sources of information outlined in this

editorial. The same process is likely to benefit the public health practitioner who plans to implement HIV prevention in a new location or utilizing new methods. The articles in this volume may be useful for this purpose.

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