Diffusion of School-Based Substance Abuse Prevention Programs

LOUISE ANN ROHRBACH
University of Southern California

CAROL N. D'ONOFRIO
University of California, Berkeley

THOMAS E. BACKER
Human Interaction Research Institute

SUSANNE B. MONTGOMERY
Loma Linda University

Despite promising evidence of the effectiveness of psychosocial-based approaches to drug abuse prevention, these programs have not been widely adopted by schools. This article considers the feasibility of widespread diffusion of empirically based prevention programs in school settings. The literature on determinants of diffusion is reviewed, results of recent research on strategies to increase diffusion are discussed, and barriers to successful diffusion in school settings are identified. The article concludes by presenting implications of these research findings for policy, practice, and future research.

School-based prevention programs have become a key component of the nation's public health agenda (U.S. Department of Health and Human Services, 1991). Because health-related behaviors and attitudes are formed early in life, reaching young people throughout childhood and adolescence is critical. Because all of America's youths are enrolled in schools, the educational system appears to be the ideal delivery system for promoting the health of youths and for preventing behaviors known to compromise their well-being and increase their risk for illness, injury, and premature death.

During the past several decades, university-based researchers have devoted considerable effort to developing and testing school-based approaches to substance abuse prevention. Programs based on theories of the psychosocial processes involved in substance use initiation have undergone the most rigorous experimentation and have shown the most promising results (Hansen, 1992; Tobler, 1986, 1992). Early studies were efficacy trials (Flay, 1986) to determine

whether programs based on these models had positive outcomes under conditions controlled by the investigators, including program delivery by trained program staff. Results showed that two models based on a psychosocial approach, social influences and life/social skills training programs, reduced experimental smoking rates among adolescents up to 50% (Flay, 1985). These approaches also reduced marijuana and alcohol use, although the effects were not as strong as those on smoking (Botvin, Baker, Dusenbury, Botvin, & Diaz, 1995; Ellickson & Bell, 1990; Hansen, Johnson, Flay, Graham, & Sobel, 1988; Pentz et al., 1989).

In later generations of research, investigators conducted effectiveness trials (Flay, 1986) to determine whether programs had positive outcomes when implemented under real-world conditions including program delivery by classroom teachers. Results showed that the implementation of psychosocial-based approaches was both feasible and effective when teachers were provided with curriculum materials and training (Botvin, Baker, Dusenbury, Tortu, & Botvin, 1990; Pentz et al., 1989). These findings suggest that programs based on the psychosocial model have high exportability and could be packaged in a manner to facilitate large-scale diffusion (Botvin, Baker, Dusenbury, et al., 1990).

Despite promising evidence of prevention effects (Tobler, 1986, 1992), these programs have not been widely adopted by schools (Hansen, 1992). To consider whether the widespread diffusion of effective school-based substance abuse prevention programs is feasible, this article reviews the literature on determinants of diffusion, results from recent research on strategies to increase diffusion, and barriers to successful diffusion in school settings.

DIFFUSION IN SCHOOL-BASED DRUG ABUSE PREVENTION

Diffusion is the process by which members of a social system learn about, decide about, and act on ideas, practices, or objects that they perceive as new (Rogers, 1995). The diffusion of innovations in schools has been characterized as a four-stage process: (a) *dissemination*, or planned efforts to make school districts aware of a program and encourage its adoption; (b) *adoption*, or the encouragement of districts to make a commitment to initiate a program; (c) *implementation*, or interventions to assist teachers or other appropriate personnel to deliver the program in accord with its original design; and (d) *maintenance*, or the encouragement of school administrators and teachers to continue using the program (National Cancer Institute, 1987). The key participants in this process are the innovators who develop the program, the change agents who work with new users to help them adopt the program, and the program providers who implement the program (Murray, 1986).

Despite the significant public and private resources that have gone into the development and testing of research-based substance abuse prevention programs, relatively few resources have been available to transfer these innovations from test sites to surrounding communities, states, and the nation (Goodstadt,

1986). Murray (1986) thus has referred to dissemination as "the neglected phase of the development and distribution cycle" (p. 375) for health education programs. Because of this neglect, psychosocial-based programs are not widely used in schools (or other settings). Instead, schools most commonly use programs—such as Project DARE, QUEST Skills for Life, Here's Looking at You, 2000, and other heavily marketed curricula—that have not been evaluated, have been evaluated inadequately, or have been shown to be ineffective (California Department of Education, 1994; Ennett, Tobler, Ringwalt, & Flewelling, 1994; Green & Kelley, 1989; Kim, 1988; Ringwalt & Greene, 1993).

Kolbe (1986) has defined the potential impact of a preventive health innovation as a function of its effectiveness in changing or preventing health risk behaviors and the extent to which the targeted population is exposed to it. Because young people are not being exposed to the psychosocial-based programs that research has shown to be effective, the public health impact of these strategies has been minimal. More effective diffusion of these programs is essential if their impact is to be increased. This requires better understanding of the diffusion process.

DETERMINANTS OF ADOPTION AND IMPLEMENTATION

Research has shown that a combination of factors predict adoption of innovative school-based programs including the organizational context in which they are used, characteristics of the innovations, and characteristics of individual program providers. Regarding the organizational context, schools are more likely to adopt innovations when there is strong teacher morale, a high degree of teacher involvement in decision making, active support of principals and general support of district administrators for the innovation, and a good fit between the innovation and local needs (Anderson et al., 1987; Basch & Sliepcevich, 1983; Berman & Pauly, 1975; Gold et al., 1991; Smith, McCormick, Steckler, & McLeroy, 1993).

Regarding characteristics of the innovations, teachers are more likely to adopt innovations when they are well specified, require the same instructional strategies that they normally use, and have a perceived relative advantage over current practices (Berman & Pauly, 1975; Fullan & Pomfret, 1977; Parcel et al., 1995). Also, in the early stages of decision making about an innovation, teachers tend to place less value on the innnovation's effectiveness than they do on practical characteristics of the innovation such as whether it has clear procedural instructions, how much preparation is required, and how students will respond to it (Hall, Loucks, Rutherford, & Newlove, 1975; Paulussen, Kok, Schaalma, & Parcel, 1995). Regarding provider characteristics, teacher adoption of tobacco and other drug abuse prevention programs is negatively associated with conservativeness, need for collegial support (Gingiss, Gottlieb, & Brink, 1994), and years of teaching experience (Rohrbach, Graham, & Hansen, 1993) and is positively associated with attitudes toward the program, comfort with the program content and approach, perceived self-efficacy to implement the pro-

gram, innovativeness (Gingiss et al., 1994; Parcel et al., 1995; Rohrbach et al., 1993), a confident and nonauthoritarian teaching style, good overall teaching skills, and characteristics such as being outgoing, adventurous, and organized (Sobol et al., 1989; Young et al., 1990).

INTERVENTIONS TO INCREASE DIFFUSION

During the late 1980s, the National Cancer Institute addressed a research gap by funding two large studies to test interventions aimed at increasing the diffusion of smoking prevention programs (Parcel et al., 1989; Steckler, Goodman, McLeroy, Davis, & Koch, 1992). Both studies used multiple strategies that targeted various key decision makers at each stage of the diffusion process. Parcel and colleagues promoted dissemination of a social influences program in 128 school districts in east Texas by training local opinion leaders to show a videotape that modeled adoption of the program. They found no difference between intervention and comparison districts in readiness to adopt the program (Brink et al., 1995). To promote adoption, they distributed a newsletter that summarized program effectiveness data and highlighted "successful" school districts that had adopted the program. The adoption rate among intervention districts (56%) was significantly greater than that among comparison districts (11%) (Parcel et al., 1995). To promote implementation, the investigators compared the relative effectiveness of a face-to-face teacher training workshop and that of a self-paced video. The workshop resulted in greater levels of program use than did the video but it had no effect on overall completeness and fidelity of implementation (Basen-Engquist et al., 1994). Finally, to promote maintenance, they distributed a newsletter and used incentives such as teacher recognition, feedback on performance, and small material rewards. A randomized test of these strategies showed that they did not have an effect on maintenance (Parcel, 1995).

Steckler et al. (1992) tested several strategies to encourage 21 school districts in North Carolina to adopt one of three empirically based smoking prevention curricula. To increase awareness (dissemination) of the programs, they made presentations at annual "Seaside Conferences" and conducted on-site meetings primarily focused on administrators (Goodman, Steckler, & Kegler, in press). The site visits increased administrators' awareness and concerns regarding tobacco prevention. To promote adoption, they implemented an organizational development technique known as "process consultation" that consisted of a workshop, a follow-up meeting, and various telephone contacts designed to aid districts to decide which of the curricula, if any, to adopt. The consultation had no effect on the districts' adoption decisions; the adoption rate was 80% with or without consultation (Goodman, Tenney, Smith, & Steckler, 1992). To promote program implementation, they provided preimplementation teacher training workshops and ongoing on-site technical assistance. Compared to teachers who did not participate in training, trained teachers implemented a greater quantity of program lessons (McCormick, Steckler, & McLeroy, 1995; Smith, Steckler,

McCormick, & McLeroy, 1995). To promote maintenance, the investigators implemented another process consultation, which resulted in comparably low levels of maintenance in intervention and comparison districts (Goodman et al., in press; McCormick et al., 1995).

Other studies of strategies to promote the adoption and implementation of innovative health education programs consistently have found that preimplementation teacher training increases program implementation (Connell, Turner, & Mason, 1985; Flay et al., 1987; Perry, Murray, & Griffin, 1990; Ross, Leupker, Nelson, Saavedra, & Hubbard, 1991). In addition, Rohrbach et al. (1993) found that a one-to-one on-site intervention with school principals increased implementation of a social influences-based substance abuse prevention program in elementary schools. Schools that received the principal intervention implemented more of the program lessons (70%) than did schools that did not (49%). Overall, these studies have shown that even when programs have been adopted by schools or school districts, implementation rates among teachers have varied considerably and maintenance has tended to be low.

BARRIERS TO DIFFUSION

Although strategies to increase the diffusion of promising substance abuse prevention programs have been identified, research reviewed in the previous section indicates that diffusion of programs in school settings is difficult. This section discusses characteristics of schools and programs that are barriers to widespread diffusion.

BARRIERS RELATED TO THE SCHOOL SETTING

The substantial turbulence that exists in many schools today is a significant barrier to implementation of any type of educational innovation. Sources of turbulence range from relatively innocuous school restructuring efforts such as changing from a traditional junior high to a middle school format (Smith et al., 1993) to on-campus gun-related violence (Sheley, McGee, & Wright, 1992). Many school systems are facing significant reductions in public funds, and some are experimenting with school reform measures in an effort to cope with these and other crises. Teachers often feel they are blamed for school failures and targeted for change programs too often (Hall, 1992). In practical terms, turbulence reduces implementation of innovative programs by affecting factors such as school schedules, teacher responsibilities for subject areas, and length of classroom sessions (Smith et al., 1993). Turbulence may also inhibit innovation by reducing the morale and efficiency of school organizations, making structural changes difficult.

The complexity and variation of school district organizational structures also are barriers to effective diffusion of prevention programs. In school districts, as in most organizational settings, a number of individuals have roles in deciding

which innovations to adopt, and those who implement the innovations usually are a different set of people (Rogers, 1995). School districts differ greatly in how decisions are made, and who needs to be involved in decisions about innovative programs is not always clear (Goodman et al., 1992). In most school districts, however, decisions about adoption of new curricula are made by school board members and senior administrators such as superintendents (Huberman & Miles, 1984). At this early point in the process, teachers usually are the "opinion givers" but not the ultimate decision makers (Goodman et al., 1992). However, individual teachers, who often operate independently from the school district and school organizational levels with regard to instructional matters (Deal & Cellotti, 1980), decide whether and how new curricula are actually used. Thus program adoption at the administrative level may be a necessary condition for implementation of innovative programs, but it is not sufficient.

A third organizational factor that may inhibit diffusion of prevention programs pertains to the context for health instruction. Most schools either mandate or endorse health education (Kolbe & Iverson, 1984); however, in practice, health rarely is an important priority. Grades six and seven are the target grades for many substance abuse prevention programs, yet health rarely is taught as a separate subject at those grade levels. Physical education and science teachers often are assigned responsibility for the health instruction provided, but these teachers may object to losing time from their primary subject matters (Levenson-Gingiss & Hamilton, 1989), resent having new programs added to their list of responsibilities without anything being taken away (Hall, 1992), or resist teaching special programs for which they are neither prepared nor held accountable. Thus widespread diffusion of prevention programs may require that school systems teach health as a required subject and develop criteria for evaluation that are comparable to those for "basic" instructional programs.

BARRIERS RELATED TO THE INNOVATION

Specific characteristics of psychosocial-based prevention programs may inhibit their widespread diffusion. For example, the use of interactive teaching methods appears to be a critical element of effective programs (Ennett et al., 1994), but such methods may be incompatible with the teaching style of many teachers, particularly those who are not certified in health (Bosworth & Sailes, 1993). Techniques such as small group discussion, role-playing, and use of peer leaders often require teachers to develop and apply new skills and change their student-teacher role relationship from one that emphasizes classroom control to one that is less predictable and more student centered (Gingiss, 1993). Preimplementation training may increase teachers' comfort with interactive instructional methods (Levenson-Gingiss & Hamilton, 1989) but it does not necessarily improve their skills in the use of them (Rohrbach et al., 1993; Rohrbach, Green, & Killen, 1992; Sobol et al., 1989).

Psychosocial-based substance abuse prevention programs may not provide a good "fit" with the health education priorities and needs of school districts. For

example, these programs take a universal prevention approach that targets all youths regardless of their previous drug use. Given schools' mission to provide youths with a foundation of basic knowledge and critical thinking skills in an era of shrinking resources, administrators may prefer to limit the allocation of valuable classroom hours to substance abuse education and target interventions to "high-risk" youths only. An exclusive focus on drug abuse prevention may also limit program attractiveness to school districts because school administrators need to address other salient adolescent health issues such as violence and teenage pregnancy. Given limited time and financial resources for health education, school districts may prefer to implement curricula that address multiple health behaviors even though the effectiveness of such programs has not been determined (Johnson, MacKinnon, & Pentz, 1996 [this issue]).

A third critical factor that may hinder diffusion of psychosocial-based prevention programs is the innovators' emphasis on minimizing local reinvention. Rogers (1995) defines "reinvention" as the extent to which an innovation is modified by the user in the process of adoption and implementation. In the health education literature, reinvention generally has been referred to as the degree of fidelity with which the original program is implemented. Because psychosocial-based programs are most effective when they are implemented with high fidelity (Botvin et al., 1995; Botvin, Dusenbury, Baker, James-Ortiz, & Kerner, 1989; Hansen, Graham, Wolkenstein, & Rohrbach, 1991; Pentz et al., 1990; Rohrbach et al., 1993), developers of these programs to date have strongly discouraged reinvention by developing curriculum guides that are very specific with regard to learning activities and teaching strategies.

Nonetheless, researchers have reported that a substantial proportion of adopting teachers do reinvent the programs in one way or another (Botvin, Baker, Filazzola, & Botvin, 1990; Rohrbach et al., 1993). Although little research has systematically studied the ways in which psychosocial-based programs are reinvented, the most common modifications appear to be a reduction in the total number of program lessons implemented and elimination or redesign of specific components within lessons (e.g., interactive activities). Individuals appear to have a strong psychological need to reinvent innovations (Rogers, 1995), and the literature on educational innovations has shown consistently that adoption is more likely when innovations can easily be adapted to fit local situations (Huberman & Miles, 1984). Thus the challenge for innovators is to develop programs that are flexible yet robust so that implementors can make modifications and develop a sense of ownership without jeopardizing program effectiveness.

IMPLICATIONS FOR POLICY AND PRACTICE

In the previous section, we identified barriers to effectively implementing research-based substance abuse prevention programs in schools. The literature on interventions to promote diffusion suggests that, despite these challenges, diffusion of research-based programs may be feasible. However, widespread

diffusion may require that different policies and practices be implemented, as outlined in the following subsections.

ORGANIZED DIFFUSION SYSTEMS

Organized diffusion systems need to be developed to promote the broad diffusion of substance abuse prevention programs that research has shown to be effective. Organized diffusion is similar to marketing, and many of the principles involved in marketing apply to organized diffusion of educational products (Basch, Eveland, & Portnoy, 1986). To date, efforts to disseminate research-based programs have been passive rather than market oriented; that is, school systems generally have learned about such programs through informal networks. At the same time, a very large and active commercial sector has been continually bombarding school districts with information about attractively packaged but unevaluated educational texts, kits, and curricula (Dielman, 1994; Hansen, 1992). At a minimum, diffusion systems for research-based programs need to be more sophisticated in considering the competition from commercial distributors.

D'Onofrio (1992) has suggested that the health field has a great deal to learn from the marketing strategies used by private industries such as manufacturers of smokeless tobacco products. Efforts to disseminate effective programs will be more successful when specific marketing targets are identified, programs are tailored to meet the needs of these various market segments, programs are packaged in attractive formats, and change agent field representatives are carefully selected and trained to adapt to the culture of schools.

Change agents or "brokers" provide the links between program innovators and intended users of the programs (Havelock, 1973). Theoretically, someone who is part of either the program developer or the user system could fill the change agent role, but research on work-site health promotion programs has suggested that diffusion is more effective if the change agent is an objective third party (Orlandi, 1986). Several organizations might appropriately serve as third-party change agents for diffusion of research-based prevention programs. Local and state governments may be effective in promoting state-of-the-art programs (e.g., Perry et al., 1990) and providing technical assistance to program users (e.g., Dijkstra, de Vries, & Parcel, 1993). Federal government programs such as the Department of Education's National Diffusion Network (1980) and the National Institute of Drug Abuse's Technology Transfer program (Backer, 1991) could also promote research-based programs on a wider scale. Recently, private foundations also have sponsored nationwide dissemination of research-based substance abuse prevention programs.[1] Program innovators additionally could consider linking with commercial companies to promote diffusion.

More research is needed on the goals, missions, and strategies of these potential third-party change agents to determine which are most appropriate for diffusing research-based substance abuse prevention programs. A key issue is whether diffusion will be most effective if a separate third-party organization is selected to diffuse each promising research-based program or whether one

change agent should be selected to represent multiple programs. The literature on interventions to increase diffusion suggests that program adoption may increase when school districts are given a choice from a comprehensive list of promising programs (e.g., Goodman et al., 1992).

A key component of a market-oriented approach is educating consumers about the importance of determining whether claims of program effectiveness are founded on sound research (Dielman, 1994). At the same time, innovators and change agents cannot assume that teachers and administrators are more concerned about a health program's proven effectiveness than they are about its cost, grade-level appropriateness, interest or face value of instructional content, and ease of implementation (Hall et al., 1975). The challenge for change agents, therefore, is to encourage consumers to adopt programs with proven effectiveness while also addressing their practical concerns related to use of the program.[3]

CRITICAL DIFFUSION STRATEGIES

In his synthesis of the knowledge base on diffusion of empirically based drug abuse programs and policies, Backer (1991) identified six critical strategies for effective diffusion. These are (a) interpersonal contact, (b) planning and conceptual foresight, (c) outside consultation on the change process, (d) user-oriented transformation of information, (e) individual and organizational championship, and (f) potential user involvement. These strategies should be systematically applied to the diffusion of research-based prevention programs, as outlined here.

First, those with direct knowledge about the innovations need to be in personal contact with teachers, administrators, and other relevant school personnel. The amount of contact made by change agents with potential adopters is one of the most fundamental factors in the success of diffusion programs (Rogers, 1995). Communication needs to occur on a regular basis during each stage of the diffusion process and should include both informal contacts and structured contacts such as training. The program implementation stage, in particular, requires ongoing attention and technical assistance on the part of change agents.

Second, careful plans should be developed for achieving adoption of the innovations and for addressing related barriers. Change agents and school personnel should work as a team to diagnose any problems that may impede program implementation and develop action plans to address them. The planning period should also be used to assess readiness for change and resources available for program implementation.

Third, outside consultants may be helpful in advising school districts regarding the "fit" between particular innovations and their local conditions. Although change agents usually will be biased toward the innovations they are promoting, it is a waste of resources to encourage adoption in districts where there is little congruence between the programs and the organizational environments (Roberts-Gray & Scheirer, 1988). Outside consultants or change agents may provide objectivity about which program provides the best fit and what needs to be done to get the programs implemented.

Fourth, research-based substance abuse prevention programs need to be packaged in formats that are user friendly, attractive, and familiar to teachers. Curriculum guides should be explicit about which elements are critical to program effectiveness and which elements may be reinvented by teachers. In addition, training and other information about the program need to be presented in language and formats that are understandable and convenient to school personnel.

Fifth, prevention programs are much more likely to be adopted when individuals within the organizations express enthusiasm for them and take leadership roles in getting them implemented. Change agents should design strategies to identify and recruit specific teachers to become such program champions at their schools (Smith et al., 1995). Because teachers who have negative attitudes toward prevention programs are less likely to implement them (Levenson-Gingiss & Hamilton, 1989; Parcel et al., 1995; Rohrbach et al., 1993), training resources should be devoted to teachers who are enthusiastic and committed to teaching the programs so that these teachers can model successful program implementation for the "late adopters" (Rogers, 1995). As Pentz et al. (1989) have demonstrated, another effective strategy is to recruit teachers who have mastered program implementation to become trainers for new program users. Qualitative research additionally has suggested that a program champion at both the senior level and the lower-to-middle administrative level increases diffusion. Goodman and colleagues (1992) found that senior administrators were instrumental in initial program adoption decisions and in providing ongoing institutional support for the programs, whereas mid-level administrators facilitated implementation by teachers.

Sixth, change agents need to promote the involvement of teachers, as well as that of key administrators, in decisions about program adoption and implementation. Parcel et al. (1995) have suggested that teams composed of school district administrators with formal authority, representative school principals, and teachers be developed to make adoption decisions. Such a strategy facilitates commitment and "felt ownership" of the new programs, thus decreasing resistance to change.

ALLOCATION OF RESOURCES

Successful diffusion requires sufficient human and financial resources. Federal support, therefore, is needed to increase the widespread diffusion of state-of-the-art drug abuse prevention programs. Rogers (1993) identified the availability of federal dollars allocated in the Drug Free Schools and Communities Act as a major factor in the extremely successful diffusion of the Project DARE program. Efforts are needed to keep the drug abuse problem as a high priority on the public agenda and to maintain support for substance abuse education in schools.

The relative allocation of funds to research and diffusion should also be shifted. Hall (1992) has stated that the implementation of school-based innova-

tions costs as much as or more than their development. Yet in the substance abuse prevention field, as in other areas of education, significantly greater resources are devoted to developing new programs than to getting them used in schools. Policy, therefore, should specify that for every dollar devoted to developing and testing innovative school health programs, a second dollar should be allocated to disseminating programs and supporting their implementation.

CONCLUSION

Efforts to diffuse promising programs are unlikely to be successful unless they are guided by research. Studies of new approaches to diffusion of substance abuse prevention programs should be accorded a higher priority. The Institute of Medicine Committee on Preventing Nicotine Addiction in Children and Youths recently recommended that "systematic research should be conducted on the optimal way to disseminate and implement tobacco use prevention programs on a large scale" (Lynch & Bonnie, 1994, p. 168).

In particular, new approaches to diffusion need to be tested through experimental trials. Future studies should address the following issues. What types of organizations are effective change agents? How does the involvement of teachers contribute to diffusion? What key players need to be targeted at each stage of the process? How much and what kinds of efforts over how long a period of time are needed to achieve significant levels of adoption? How do schools plan for implementation of prevention programs? What types of incentives increase program implementation? How are programs reinvented and how can programs be developed that are sufficiently robust to withstand local reinvention? How might communities be mobilized to support schools in the implementation of effective programs?

In undertaking research on these issues, efforts must be made to bridge the gap between research and practice in substance abuse prevention. The communication gap between developers and users of school-based prevention programs parallels the gap between educational policymakers and practitioners described by Hall (1992). Program developers often fail to recognize or accept the complexities of life in the classroom. They believe their programs should be accepted without reservation because they are "good for students." They also assume that program adoption will result in long-term implementation. At the same time, teachers often have negative attitudes toward research and resist adopting innovative programs developed by researchers whom they believe are "isolated from the real world."

To bridge this gap, researchers need to spend more time in schools to increase their interactions with teachers and principals. They need to involve teachers early and throughout the curriculum development process. They should place more emphasis on formative evaluation methods such as focus groups with students and classroom observations. They should also encourage and provide technical assistance to school districts for ongoing evaluation of program

implementation. At the same time, teachers need to develop "a larger world view than their classroom" (Hall, 1992, p. 898) and build partnerships with researchers who are developing new models for health education.

In view of the continuous demand of schools and communities for innovative and effective programs, researchers who develop health programs need to find a better balance between the early phases of research on prevention approaches and the diffusion of effective models. At present, the development of university-based prevention programs involves sequential research on hypothesis and methods development, efficacy testing, and effectiveness testing. Some researchers argue that by the time this research is completed and prevention programs are ready for dissemination, the programs may be outdated or out of step with the current hegemony in the education field. Prevention programs are likely to have a greater impact if they are diffused more rapidly than they are at present. On the other hand, lack of funds for dissemination research may be a more vital concern than is the time involved in earlier phases of program development. Careful program development should not be ignored.

In summary, several decades of research on school-based prevention approaches have produced programs that are effective in reducing substance abuse among youths. However, the public health impact of promising programs has been minimal because few young people have been exposed to them. Preliminary research suggests that diffusion of research-based programs to school settings may be feasible, but it will be challenging. To increase the impact of these programs, policy should specify the allocation of greater resources to diffusion, and future research should address the development, implementation, and evaluation of effective diffusion strategies.

Because most substance abuse prevention programs have been school based, research on diffusion to schools is a logical priority. However, there is also a need for research on diffusion of promising prevention approaches to nonschool settings such as churches, community centers, youth groups, and clinics. More emphasis on diffusing prevention programs to a variety of settings is likely to increase the public health impact of research-based models.

NOTES

1. For example, the Conrad Hilton Foundation provided funds to the RAND Corporation for the development and efficacy testing of Project ALERT (Ellickson & Bell, 1990) and to the BEST Foundation for broad dissemination of the program. In addition, the E. M. Kauffman Foundation supported the implementation of Project STAR in the Kansas City metropolitan area (Pentz et al., 1989) and diffusion of the program throughout the states of Kansas and Missouri. The Robert Wood Johnson Foundation has provided funds for the "Fighting Back" program, which supports communities nationwide to develop substance abuse prevention coalitions. Some of these coalitions have implemented school-based programs as components of their community-wide prevention activities.

2. One strategy that has been useful in disseminating effective educational programs is to have innovators and current users of innovations identify the key elements that, in their view, have made the programs successful. For example, to assist communities in making decisions about substance

abuse programs, staff at the E. M. Kauffman Foundation in Kansas City recently attempted to discern "key learnings" from the development, implementation, and dissemination of Project STAR (Pentz et al., 1989). For a key learning strategy to be successful on a wide scale, university-based innovators, government agencies, and practitioners will need to develop a consensus about what makes school-based substance abuse prevention programs effective. The dissemination of disparate sets of criteria by different sectors, as has been done to date, is confusing.

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