The diffusion of school-based tobacco-use prevention programs: project description and baseline data

Guy S. Parcel, Michael P. Eriksen, Chris Y. Lovato, Nell H. Gottlieb, Susan G. Brink and Lawrence W. Green

Abstract

Evaluation studies indicate that school-based smoking prevention programs can be effective in preventing the initiation of smoking by adolescents. However, the potential impact of these programs has been limited because few schools use programs which have been shown to be effective. Efforts to increase adoption of these programs by schools are needed. This paper presents the rationale, theoretical basis, intervention strategies and initial findings from one of two federally funded studies to develop and evaluate interventions to enhance the diffusion of tested prevention programs. Survey results at baseline indicate that school administrators and teachers have a high receptivity for adopting a tobacco-use prevention program, but the reported use of evaluated curricula was low. The majority of school districts develop their own teaching programs which may not contain important elements of successfully evaluated programs. Most school districts had smoking policies, but few applied restrictions to groups other than students. These data and other conditions indicate a supportive climate as well as the need to develop and evaluate strategies to encourage the diffusion of tobacco-use prevention programs.

Introduction

National priorities and objectives for health promotion and disease prevention have been clearly established (USDHEW, 1979; USDHHS, 1980, 1986). To pursue these objectives, many risk reduction and disease prevention interventions have been developed, implemented, and their effectiveness evaluated through research and demonstration programs. Unfortunately, the diffusion of programs beyond the demonstration sites is often slow. As a consequence, the potential for significant public health benefit is lost. This situation is particularly evident for programs aimed at preventing the use of tobacco among adolescents.

Schools are the logical site in which to conduct tobacco-use prevention programs. Nearly 95% of all children and youth are in elementary or secondary schools (Iverson and Kolbe, 1983), and most schools either mandate or endorse school health education (Kolbe and Iverson, 1984). Many of these programs include tobacco as an integral component. The National School Board Association (1987) estimates that anti-smoking education programs are part of the curriculum in the majority of school districts in the country and are present in nearly two-thirds of middle and junior high schools. The 1987 School Health in America Study found that 20 states (40%) mandate tobacco-use prevention education and that 22 states (44%) have a law or regulation that restricts smoking in public schools (Lovato et al., 1989). Unfortunately, many school-based smoking prevention efforts often are didactic, one-shot efforts, are not integral to the curriculum or to school policies, and do not reflect state-of-the-art behavior change strategies.
Recent smoking prevention programs have demonstrated an ability to keep 'baseline never smokers' abstinent (Luepker et al., 1983) and to prevent the onset of smoking by up to 50% in students exposed to the program (Perry et al., 1987). These programs have also been shown to reduce the prevalence of tobacco use in students who had experience with smoking at baseline (Flay et al., 1985).

Although these programs have been shown to be effective and appear to have long-lasting impact, they have been conducted only among a small proportion of students and the techniques have not been diffused to the larger at-risk population. Clearly, the greatest public health impact can be achieved by increasing the number of students exposed to currently effective prevention programs. The current challenge is to investigate the factors associated with the successful diffusion of effective programs. The National Cancer Institute (NCI) has acknowledged this problem and has recognized that, in spite of a number of NCI-funded research and demonstration programs that have resulted in effective programs to prevent adolescent smoking, the actual number of students reached has been relatively small (Best et al., 1988).

In 1987, NCI funded two research projects designed to study the process of influencing the diffusion of tobacco-use prevention programs to schools. These projects are designed to determine factors that relate to the diffusion of tobacco-use prevention and to test interventions designed to influence the diffusion process. The purpose of this paper is to present the conceptualization, design and initial baseline characteristics for one of the two NCI-funded research projects. The major goals of the project are: (i) to develop and evaluate intervention strategies to increase the diffusion of a demonstrated effective tobacco-use prevention program into school districts; (ii) to analyze the diffusion process to determine factors that influence adoption and implementation of the tobacco-use prevention program; and (iii) to decrease the percentage of students who use or begin to use tobacco products.

This paper will provide an overview of the theoretical foundations of the project and describe the project design and interventions in relation to the first two goals. The project's impact on student tobacco-use is being measured, but is not reported, in this paper. This paper will also present baseline data to document existing conditions for program adoption and demonstrate the need for interventions to further the diffusion of school-based prevention programs.

**Theoretical foundations**

Diffusion theory and social learning theory provide the overall conceptualization for this project and are used to design the intervention strategies.

Diffusion theory accounts for the pattern of adoption of a new idea or innovation by a population. It provides a predictive model of what to expect, a descriptive model of what is happening, and an explanatory model of what transpired in the process of change by a population (Mohr, 1982; Rogers, 1983; Green and McAlister, 1984; Green et al., 1989).

Diffusion is conceptualized as a staged process of adoption of a specific intervention among individuals or organizations over time. The resulting pattern is depicted by a cumulative logistic or S-shaped curve as shown in Figure 1 (Rogers, 1983; Green et al., 1989). A population of individuals or organizations can be characterized as innovators, early adopters,
early majority, late majority or laggards based on their point of adoption of the innovation relative to others on this curve (Rogers, 1983).

Attributes of the innovation, decision-makers’ perceptions of them and organizational characteristics are key to all phases of the diffusion process. Whether the intervention is perceived: as needed, as an improvement over existing practices, as easy to implement, as compatible with existing values and practices and whether it is easily communicated, will influence the decision process (Graham, 1973; Basch and Sliepcevich, 1983; Moss, 1983; Rogers, 1983; Kolbe and Iverson, 1984; Roberts-Gray, 1985; Orlandi, 1986; Scheirer, 1986; Ottono and Green, 1987). Other factors such as expectations, perceived availability of resources, willingness to make changes in the status quo, support and reinforcement, and self-efficacy have also been identified as factors that influence adoption of an innovation (Morrish, 1976; Pincus, 1976; Louis and Rosenblum, 1981; Scheirer, 1981, 1986; Mohr, 1982; Basch and Sliepcevich, 1983; Rogers, 1983; Basch, 1984; Kolbe and Iverson, 1984; Roberts-Gray, 1985; Basch et al., 1986; Gottlieb et al., 1987; Ottono and Green, 1987; Green et al., 1989). In addition, organizational characteristics, such as size, slack resources, professionalism, decentralization and informal social networks, have been found to be positively associated with innovativeness (Mohr, 1982; Rogers, 1983).

Social learning theory (Bandura, 1977, 1986) offers a framework for designing interventions to influence diffusion through all four phases of the diffusion process. Modeling (i.e. the observation of others experiencing the innovation) can inform potential adopters about the relative benefits of an innovation, influence expectations and value expectancies for the outcome of adoption, and provide vicarious reinforcement for adoption. The provision of incentives for adoption and enhanced self-efficacy for decision-making and implementation of the innovation can facilitate diffusion. The design of such interventions should be grounded in the context of the targeted organizations or individuals.

The interventions developed for use in this study will make extensive use of modeling and incentives to influence the dissemination, adoption, implementation and maintenance of the tobacco-use prevention program in the schools. For example, in the dissemination intervention, we will use the ‘dual-link’ model which includes both media channels and interpersonal channels to provide symbolic modeling and observation (Bandura, 1986). It may not be possible or cost-effective to transport school personnel from several school districts to observe the successful use of the tobacco-use prevention program. Thus, from district to district, the interpersonal channel would be difficult to use. However, media such as video tape or print material can be used to model the use of the program by one district for observation by several other districts. Once the media reaches a school district, the further dissemination can make use of the interpersonal channels such as demonstrations, meetings, and discussions to continue further exposure to media material. In both channels, the essential components of the intervention strategies include modeling the benefits, effective use and positive outcomes from using the tobacco-use prevention programs in the schools.

According to Bandura (1986), environmental inducements serve as regulators of the adoption of an innovation, and adoptive behavior is highly susceptible to the influence of incentives. Thus, two major strategies that can be used to influence schools to adopt innovative health promotion programs are: (i) demonstrate how the program will benefit the users and fit effectively into current activities and goals of the organization; and (ii) create incentives that will provide social or economic benefits to teachers, administrators or the school district.

The application of social learning theory can also be extended to the implementation of a school-based health promotion program by applying the principles of skill training for the program implementors. Empirical studies of the implementation of innovative school programs have demonstrated the importance of teacher training in influencing program success including implementation and student learning outcomes (Huberman and Miles, 1984; Connell et al. 1985). Following the initial implementation of the program, maintenance and eventual institutionalization within the schools will be influenced by
feedback on success in meeting program objectives and by incentives for continued implementation.

**Project description**

The study is being conducted in the state of Texas which has 1057 independent school districts located within 20 education service regions. The regions are supported by two teacher training centers—one in the western half of the state, the other in Houston. The large number of districts in the state required that the study have a geographic focus. The decision was made to select our study regions from the 11 regions in the eastern half of the state. This decision enabled us to control for teacher training site.

Of these 11 regions, three were selected for intensive data collection (Figure 2), two of which were also to be targets of the diffusion intervention. The third region serves as a comparison region. The decision to use three of 11 regions was based on the need to limit the study to a manageable number of school districts while having sufficient numbers to meet the experimental conditions for evaluating the implementation and maintenance interventions.

The criteria used to select the three educational service regions participating in the study were: (i) the region was densely populated and (ii) a major tobacco-use prevention program was not planned or currently under implementation in the region. Additionally, each region selected for the diffusion intervention must have a health education specialist assigned to the regional education service center.

The innovation that will be disseminated to the Texas schools is the Minnesota Smoking Prevention Program (Perry et al., 1987), modified to fit regional differences and renamed ‘Smart Choices’. The program includes both curricular and policy components. School districts in the 18 non-intervention regions will receive a brochure announcing the availability of the ‘Smart Choices’ program. School districts in the remaining two regions will be exposed to a series of diffusion interventions designed to influence the rates of dissemination, adoption, implementation and maintenance of the ‘Smart Choices’ program by school districts. Data on program adoption will be collected from school districts in all 20 regions over a three-year period to construct an adoption curve.

**Intervention and evaluation methods**

The diffusion intervention uses the existing educational structures within the state. The content of the intervention is partly guided by the conditions for adoption described by baseline data and by constructs derived from diffusion theory and from social learning theory. Each phase—dissemination, adoption, implementation and maintenance—includes multiple intervention strategies. These strategies are summarized below and in Table I.

**Dissemination**

The intervention strategies in the dissemination phase have two purposes: (i) to provide information about the tobacco-use prevention program and (ii) to increase the motivation of potential users to adopt the program. This phase has three components: development of district opinion leaders to share information within districts, a diffusion network to share information across districts, and use of media channels to facilitate exposure to the innovation. Each district is asked to appoint a representative to serve as an opinion leader. A one-day workshop prepares...
Table 1. Diffusion intervention strategies

<table>
<thead>
<tr>
<th>Diffusion phase</th>
<th>Target level</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissemination</td>
<td>Administrators</td>
<td>Diffusion network</td>
</tr>
<tr>
<td></td>
<td>Teachers</td>
<td>Opinion leaders</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Video-based modeling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interpersonal communication channels</td>
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<tr>
<td></td>
<td></td>
<td>Vicarious reinforcement</td>
</tr>
<tr>
<td>Adoption</td>
<td>Administrators</td>
<td>Print material for modeling</td>
</tr>
<tr>
<td></td>
<td>Teachers</td>
<td>Incentives</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vicarious reinforcement</td>
</tr>
<tr>
<td>Implementation</td>
<td>Teachers</td>
<td>Video-based training</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Modeling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Skill of training</td>
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<tr>
<td></td>
<td></td>
<td>Reinforcement</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Administrators</td>
<td>Incentives</td>
</tr>
<tr>
<td></td>
<td>Teachers</td>
<td>Feedback for reinforcement</td>
</tr>
</tbody>
</table>

Adoption

A newsletter mailed to all intervention region schools is the major element of the adoption phase intervention. The print material provides examples of administrators and teachers deciding to adopt 'Smart Choices' and offers incentives to adopt, including benefits of the program and reductions in program and training costs. Adoption will be measured by the district superintendent completing a program adoption form required for ordering copies of the program and enrolling in training.

Implementation

The implementation phase tests the efficacy of two approaches to train teachers in conducting the tobacco prevention program: an in-service workshop and a self-instructional video package. Both methods use the three-faceted approach of modeling, guided practice and self-directed application of acquired skills suggested by Bandura (1986). Self-reports of teacher implementation will serve as the primary outcome measure to determine the completeness and fidelity of program implementation. These data will be validated by comparing teacher reports with student reports of what was implemented in the classroom.

In addition to these measures, instrumentation from the Concerns-Based Adoption Model (Loucks et al., 1976; Hall et al., 1977; Hall and Loucks, 1978) will be used to assess: (i) various operational forms of the innovation that result as teachers adapt the program to their particular situation, (ii) teachers’ comfort and skill in implementing the program and (iii) teachers’ attitudes regarding involvement with the program.

Maintenance

The maintenance phase intervention is designed to require a minimal amount of input from external sources but to provide sufficient attention to encourage continuation of 'Smart Choices'. Three types of incentives include: (i) reinforcement through recognition; (ii) feedback on student learning outcomes; and (iii) special attention to the teachers. Focus groups will be used to determine the specific types of incentives which are needed to be applied.
in each of these categories. To evaluate the impact of the maintenance intervention, program continuation will be monitored, as well as implementation completeness and fidelity, as conducted for the implementation phase.

As part of the development and evaluation of the diffusion interventions, baseline data were collected on the prevalence of tobacco-use prevention curricula and policies, as well as on relevant teacher and administrator characteristics. In addition, district organizational data, including size, wealth (taxable value per average daily attendance), population density of district and student socio-economic status (percentage of students on federal lunch subsidy) have been obtained from TEA. In subsequent analysis, these district level variables and teacher/administrator characteristics, including receptivity attitudes, professional cosmopolitanism, prior training in health education and years of teaching, will be used to specify models of adoption, implementation and maintenance.

**Research design**

As shown in Figure 3, the research design is a series of studies conducted within four separate but interrelated phases. The series begins with the dissemination phase which uses a pre-test—post-test quasi-experimental design with 128 districts assigned to the intervention group and 38 districts assigned to the comparison group. The assignment to intervention and comparison groups is by TEA region rather than by random assignment because the diffusion interventions are based on geographic proximity of districts and application within existing structures of the state department of education. The intervention districts are exposed to the dissemination intervention (X—1D in Figure 3) and a comparison of change in receptivity toward program adoption (O—1D and O—2D) is made between the intervention and comparison districts. The intervention districts are then exposed to the adoption intervention (X—2D) and a comparison of program adoption rates is made between the districts in intervention and comparison groups (O—3D).

The implementation phase involves only those school districts in the intervention group who adopt the 'Smart Choices' prevention program. Adopters are randomly assigned to two types of teacher training formats: workshop face-to-face training (X—3D) and video-based, self-paced training (X—4D). Program implementation (O—4D) is then compared between districts receiving the two different types of training to determine if video-based training can be more cost effective than traditional workshop training. The maintenance phase also involves an experimental study with districts which implement the program randomly assigned to receive the intervention (X—5D) or to a non-intervention group. The implementation of the maintenance intervention will be monitored, as well as implementation completeness and fidelity, as conducted for the implementation phase.
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control group (C−5D). The maintenance intervention is evaluated by a comparison of program implementation (O−5D) between districts in the intervention and control groups. Also, at the end of the maintenance phase a survey will be conducted in the comparison districts (O−5D) to determine the extent to which program adoption and implementation have taken place without exposure to any of the diffusion interventions.

Not shown on Figure 3 is the design for determining the impact of the ‘Smart Choices’ program on students’ tobacco-use behavior. During the implementation and maintenance phases, self-reported behavior will be measured in participating districts in the intervention and comparison groups to determine tobacco-use at baseline, following intervention and at one year follow-up.

In addition to monitoring program adoption in the intervention and comparison districts, all the remaining school districts in Texas will be monitored for program adoption over the four-year period of the study to construct adoption curves for a minimal dissemination intervention (a program announcement brochure). Organization characteristics of districts will be used to distinguish differences in adoption status over time.

These interrelated series of studies are designed to address the following outcomes of interest: (i) rates of adoption by districts according to treatment, (ii) environmental, cognitive, organizational and behavioral factors related to adoption, (iii) completeness and fidelity of program implementation and (iv) rates of maintenance of the program by districts within treatments, and student cognitive and (v) behavioral outcomes related to prevention of tobacco use.

Method

Subjects

The data described in this paper represent two separate surveys. A prevalence survey was mailed to each school district, and a receptivity survey was mailed to teachers and school administrators within districts. Data on the status of school policies and programs (prevalence survey) were collected from 144 of the 166 school districts (87%) after two follow-up mailings. Of those surveys returned, 61% were completed by the district superintendent or an assistant superintendent, 11% by principals, and 10% by curriculum coordinators. The remaining 18% were completed by other district administrators, counselors, teachers and school nurses.

Data on relevant administrator and teacher characteristics (receptivity survey) were collected from 118 of the 166 school districts in the three study regions. Survey respondents included 483 district and school level administrators and 277 seventh-grade science and health education teachers. Within the surveyed districts, a response rate of 87% was obtained for administrators and 82% for teachers after two telephone follow-ups.

Of administrators comprising the receptivity survey sample, 74% were male and 26% female. The teachers’ sample was 51% male and 49% female. Mean ages were 48 years and 40 years for administrators and teachers respectively. Eighty percent of administrators and 88% of teachers were currently non-smokers.

Procedures

A one-page survey containing 13 questions was developed to assess the prevalence of tobacco-use prevention curriculum and policy among school districts in the three study regions. A cover letter and the survey instrument were mailed to the superintendent of schools in each of the study districts. All questions were closed-ended and designed to assess the current prevalence of tobacco-use prevention curricula and policies, as well as their relevant characteristics. A tobacco-use prevention curriculum was defined as a ‘series of instructional lessons with stated learning objectives and planned student learning activities’. In addition to prevalence, the name of the curriculum, grade levels taught and individual with primary responsibility for instruction were identified. The prevalence of written policies that restrict or prohibit tobacco-use was also assessed, including other policy characteristics such as type of individuals affected, locations included, compliance, enforcement and communication techniques.

Separate surveys were developed for teachers and
administrators to assess the level of receptivity to a tobacco-use prevention program that includes: (i) a curriculum for seventh-grade science classes and (ii) tobacco-use policies for students and school employees.

To develop the survey, key concepts from the literature on diffusion and social learning theory related to the adoption of an innovation were identified. From these concepts, items with a five-point Likert Scale were developed (i.e. strongly disagree to strongly agree) and pretested on a sample of science teachers (n = 69) and administrators (n = 28). Reliability of the revised instruments was tested at baseline using Cronbach’s alpha. For the teachers’ survey, total alpha was 0.86 and for the administrators’ survey, total alpha was 0.87.

Data from the survey will later be used to evaluate the impact of the dissemination intervention. In this paper, a subset of 16 items is presented that were selected to provide information that would guide

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Disagree (%)</th>
<th>Neither agree nor disagree (%)</th>
<th>Agree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Commitment/perceived need: Tobacco-use prevention should be taught in schools</td>
<td>A* 2</td>
<td>4</td>
<td>94</td>
</tr>
<tr>
<td>2. Legitimacy: Officials view tobacco-use as important priority</td>
<td>A 4</td>
<td>33</td>
<td>63</td>
</tr>
<tr>
<td>3. Support: Administrators/teachers view tobacco-use prevention important for seventh-grade students</td>
<td>A 4</td>
<td>29</td>
<td>67</td>
</tr>
<tr>
<td>4. Organizational fit: Tobacco-use prevention curriculum will fit with seventh-grade science classes</td>
<td>A 6</td>
<td>17</td>
<td>77</td>
</tr>
<tr>
<td>5. Resistance to change/degree of change: Adding a tobacco-use prevention curriculum to seventh-grade classes would interfere with science curriculum already established</td>
<td>A 62</td>
<td>24</td>
<td>14</td>
</tr>
<tr>
<td>6. Social reinforcement: Tobacco-use prevention would contribute to a good evaluation</td>
<td>A 18</td>
<td>51</td>
<td>31</td>
</tr>
<tr>
<td>7. Self-efficacy: Can teach effectively to prevent students’ use of tobacco products</td>
<td>A –</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>8. Competition/perceived need: Already enough tobacco-use prevention curricula available for seventh-grade classes</td>
<td>A 55</td>
<td>34</td>
<td>11</td>
</tr>
<tr>
<td>9. Timeliness: Time is right for introduction of seventh-grade tobacco-use prevention curriculum</td>
<td>A 7</td>
<td>35</td>
<td>58</td>
</tr>
<tr>
<td>10. Resources: School does not have resources to purchase materials for a new tobacco-use prevention curriculum</td>
<td>A 30</td>
<td>27</td>
<td>43</td>
</tr>
</tbody>
</table>

*Administrators—sample size ranged between 476 and 482 for individual items due to missing data.

*Teachers—sample size ranged between 269 and 273 for individual items due to missing data.

*P ≤ 0.05; **P ≤ 0.01.
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development of the dissemination and adoption interventions. These items were selected because they are most logically associated with receptivity to the innovation, are related to important theoretical concepts in social learning, and are most amenable to intervention.

Receptivity to curriculum
Data from the receptivity survey were aggregated according to administrators and teachers and collapsed into three response categories: (i) an ‘agree’ category which combines ‘strongly agree’ and ‘agree’, (ii) ‘neither agree nor disagree’ and (iii) a ‘disagree’ category which combines ‘strongly disagree’ and ‘disagree’. Frequencies and chi-squares were carried out on the 10 items described in Table II.

Commitment/legitimacy/support
Over 90% of teachers and administrators agreed that tobacco-use prevention should be taught in schools. However, a significantly lower proportion of teachers than administrators felt that school district officials view tobacco-use prevention as an important teaching priority [50% versus 62%, $\chi^2 = 12.40$ (2 d.f.), $P < 0.01$].

Both administrators and teachers tend to agree that each group considers tobacco-use prevention to be an important topic for seventh-grade students. Nearly three-quarters of teachers (73%) felt that administrators view tobacco-use prevention as an important topic with about two-thirds of administrators (67%) reporting that teachers view the topic as important.

Organizational fit/resistance to change
Over 75% of administrators and teachers felt that a tobacco-use prevention curriculum could fit in well with the seventh-grade science classes at their school. Similarly, 62% of both administrators and teachers did not believe that the introduction of a curriculum would interfere with the currently established science instruction.

Social reinforcement
Over one-half of teachers (57%) and administrators (51%) neither agreed nor disagreed that either teaching a tobacco-use prevention curriculum or assuring that a curriculum be taught would contribute to a good performance evaluation.

Self-efficacy
The majority of administrators (73%) agreed that they felt confident in ensuring the effective use of a program in their district. Sixty-seven per cent of

Results

The following is a description of results from the prevalence and receptivity surveys. Results from items related to curriculum are presented first, followed by results of items related to policies. The receptivity data in Tables II and IV represent an aggregation of the responses of individual teachers and administrators in all of the responding districts (118) in the three study regions. These data are presented to provide an overview of initial teacher and administrator receptivity to tobacco-use prevention curricular and policy innovations and are not intended to provide a baseline receptivity measure of school districts (the unit of analysis) in the intervention and comparison regions. Subsequent analysis will use the district as the unit of analysis to determine the effectiveness of the diffusion interventions.

Prevalence of curriculum
Fewer than one-half of the school districts (42%) currently have a tobacco-use prevention curriculum. Of those that have a tobacco-use prevention curriculum, 46% reported that it has been developed internally within the school district. Less than 12% of districts use nationally recognized and/or tested curricula such as the American Heart Association’s ‘Putting Your Heart Into the Curriculum’ or the American Cancer Society’s ‘Help Myself’ program.

Tobacco-use prevention curricula are taught in multiple grades within a district but most frequently in the seventh grade (85%), and less often in sixth grade (63%), eighth grade (53%) and ninth grade (46%). Thirty-six per cent reported that the topic is taught in a grade level other than sixth through ninth. When used in the seventh grade, it is almost always taught by either science (56%) or health teachers (35%).
teachers agreed that they can teach effectively to prevent student use of tobacco.

**Competition/timeliness/resources**

Over one-half of teachers (57%) and administrators (55%) tended to agree that there are not enough tobacco-use prevention curricula available for use in seventh-grade classes. Teachers (67%) were significantly more likely than administrators (58%) to believe that the time is right for introduction of a curriculum \(\chi^2 = 7.76 \text{ (2 d.f.)}, P < 0.05\). The two groups also differed significantly in their perception of resource availability \(\chi^2 = 11.06 \text{ (2 d.f.)}, P < 0.01\). Teachers are as likely to agree (32%) as to disagree (31%) that resources will be available to purchase the required materials for a new curriculum, while administrators are more likely to report concern that resources are not available (43%).

**Prevalence of policies**

As seen in Table III, nearly all surveyed districts reported that they restrict student tobacco-use in buildings (99%), on school grounds (99%) and at extracurricular events (92%); however, less than half of the districts control the tobacco-use of faculty, staff and visitors on school grounds and < 25% at extracurricular events.

District administrators reported a mixed level of compliance with tobacco-use policies. School district administrators are more likely to rate faculty and staff compliance as 'excellent', compared to students or visitors.

**Receptivity to policies**

The same methods used to analyze the curriculum questions were used to analyze the policy questions. Of the six items related to policy receptivity shown in Table IV, three were asked only of administrators, therefore teacher—administrator comparisons were not made for these items.

**Commitment**

The overwhelming majority of respondents (98% and 97%) in both groups believe that a non-smoking policy for students should be strictly enforced.

**Expected outcome**

Over two-thirds of both administrators and teachers believe that a non-smoking policy for school employees would make student educational efforts more effective.

**Support/commitment**

A significant difference was found for the perceived level of employee support for a non-smoking policy restricting employee smoking, with administrators significantly more likely to believe that employees would support such a policy \(\chi^2 = 8.93 \text{ (2 d.f.)}, P < 0.01\). Approximately one-third of administrators are in favor of a non-smoking policy for employees, and a similar number believe that employees would support such a policy. Only 24% of teachers agreed that school employees would support a non-smoking policy that restricts their smoking.

**Self-efficacy**

Nearly one-half of administrators (47%) are
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Table IV. Comparison of teacher and administrators responses to items indicating their receptivity to a tobacco-use policy for their school

<table>
<thead>
<tr>
<th>Item</th>
<th>Disagree (%)</th>
<th>Neither agree nor disagree (%)</th>
<th>Agree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Commitment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support a strictly enforced non-smoking policy for students</td>
<td>A* 1</td>
<td>1</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>T* 1</td>
<td>2</td>
<td>97</td>
</tr>
<tr>
<td>2. Expected outcome</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>non-smoking policy for employees</td>
<td>A 10</td>
<td>17</td>
<td>73</td>
</tr>
<tr>
<td>would make educational efforts to prevent tobacco-use among students more effective</td>
<td>T 10</td>
<td>19</td>
<td>71</td>
</tr>
<tr>
<td>3. Support</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employees would support a non-smoking policy that would restrict their smoking</td>
<td>A 32</td>
<td>33</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>T 40</td>
<td>36</td>
<td>24**</td>
</tr>
<tr>
<td>4. Commitment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In favor of a non-smoking policy for employees</td>
<td>A 16</td>
<td>17</td>
<td>66</td>
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<td></td>
<td>T</td>
<td>-</td>
<td>-</td>
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<tr>
<td>5. Self-efficacy</td>
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<td></td>
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<td>Confident that school/district could effectively implement a non-smoking policy for employees</td>
<td>A 21</td>
<td>32</td>
<td>47</td>
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<td>6. Timeliness</td>
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<td>Time is right for introduction of a non-smoking policy that includes employees</td>
<td>A 16</td>
<td>48</td>
<td>36</td>
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Administrators—sample size ranged between 476 and 482 for individual items due to missing data.
Teachers—sample size ranged between 266 and 269 for individual items due to missing data.
**P < 0.01.

confident that their school district could effectively implement a non-smoking policy for employees, with one-third reporting that they are uncertain and 21% not being confident of the district's ability to implement such a policy.

Timeliness
Thirty-six per cent of administrators agree that the time is right to introduce a non-smoking policy that includes employees, with nearly half neither agreeing nor disagreeing.

Discussion
The results of these baseline surveys suggest that both teachers and administrators are receptive to teaching tobacco-use prevention in schools and to adopting non-smoking policies for school employees. However, the current level of practice, particularly the use of tobacco-use prevention curricula for students and non-smoking policies for teachers and staff, is exceedingly low. Fewer than one-half of the districts surveyed report using a formal tobacco-use prevention curriculum and nearly one-half of those that do use a curriculum, use one that they have developed themselves.

Because teachers and administrators appear to be receptive to adopting effective prevention programs, it is necessary to develop individual and organizational interventions that lead to increased diffusion of effective programs. To develop effective diffusion interventions, it is important to understand why districts are not already utilizing proven programs and what steps in the diffusion process need to be targeted. For example, should interventions be directed at disseminating the characteristics and availability of effective programs, or directed at assisting school districts in the implementation and
These initial survey results have already influenced the development of the videotape and newsletter components of the dissemination and adoption interventions and will be used to develop the implementation intervention for the tobacco policy component. A further analysis of our baseline data provides some information that will be useful in the development of other diffusion interventions. For example, not only are teachers and administrators very receptive to tobacco-use prevention programs, they tend to share similar views on the subject. Thus, a school-district-wide appeal may be more cost effective than developing and directing separate interventions to teachers and administrators.

The data suggest generally high receptivity, although there are specific areas which can be targeted for intervention. Only one-half of the teachers believe that school district officials consider tobacco-use prevention to be an important priority. Because administrators are significantly more likely than teachers to agree with this statement, an appropriate intervention is likely to be effective in increasing teacher perceptions in this area. Similarly, the majority of both teachers and administrators are uncertain as to whether adoption of a tobacco-use prevention program would contribute to a good individual performance evaluation. An intervention directed at supervisors to include prevention activities in appraising job performance may affect perceptions in this area.

Lack of resources may be a serious barrier to widespread program adoption. Our data, however, do not indicate whether this concern is actual or perceived, and whether teacher and administrator concern related to resources will predict adoption of the program by the school. Strategies to address this barrier would differ depending on its nature and would range from program subsidies and information about program costs and benefits to steps that would make cost less of an issue.

Successful program diffusion is not solely dependent upon analyzing or manipulating characteristics of the individual or of the innovation. Environmental and organizational factors are also critical in determining whether programs are diffused or impeded. In Texas, several organizational factors provide an opportunity to test specific diffusion interventions. Texas educational standards require tobacco education for the seventh grade. Most school districts will meet this requirement through the seventh grade life science class. Thus the teacher of seventh-grade life science is confronted with teaching in a new area and needs either to adopt or to develop curricula to address the tobacco education requirements. Because the diffusion intervention in Texas will build on existing state structures and resources, the diffusion model will have a high probability of being transferable to other regions of the state and to other health education programs. The regional service centers located throughout the state function as a resource to local school districts in curriculum development, staff development and instructional support services. The approach will be to demonstrate the feasibility of implementing a theory-based diffusion intervention to move health promotion innovations from research and demonstration status to widespread use in school settings.

In summary, the results of this study suggest that while school district receptivity to tobacco-use prevention programs is high, the current level of practice is relatively low, particularly regarding the use of proven tobacco-use prevention curriculum. Because effective educational interventions have been developed, the public health challenge is to disseminate these programs widely to school districts throughout the nation and to encourage their adoption, implementation and maintenance. The findings of this project will contribute to a better understanding of factors that influence the diffusion of school-based health promotion programs. The application of established theoretical frameworks will add to our understanding of how to develop diffusion interventions in schools as well as in other settings.

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