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Past and Future Directions of the D.A.R.E.® Program: An Evaluation Review

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Since its inception in the early 1980s, Drug Abuse Resistance Education (D.A.R.E.®) has become the Nation's most prevalent school-based drug use prevention program. D.A.R.E.® is distinctive among such programs in that it uses trained, uniformed police officers in the classroom to teach highly structured curricula. D.A.R.E.® is also distinctive in that it combines a partnership between law enforcement and education at the local level with a high degree of centralized program control asserted by coordinating mechanisms at the State, regional, and national levels.

Despite the wide dissemination of drug use prevention efforts nationwide, an understanding of the effects of D.A.R.E.® and other such programs in our Nation's schools is only beginning to emerge.

Insert Box 1 about here

In recent years, several comprehensive reviews of school-based drug use prevention program evaluations have been conducted.[1-8] These have increasingly pointed to the efficacy of psychosocial approaches, as opposed to those that provide information or seek to change attitudes or increase self-esteem. Psychosocial approaches emphasize the development of social skills in general, and of peer-refusal skills in particular, and typically include peer interaction components. Although D.A.R.E.® is usually considered to be a psychosocial approach, it includes lessons representing all the areas identified above.

Reviews have focused on the effectiveness of prevention programs, but attempts to synthesize findings from a variety of sources into an integrated assessment have been rare. This study represents an effort to synthesize information from several sources, including original and secondary data, to provide an overall evaluation review of D.A.R.E.®

D.A.R.E.® curricula

The primary (or core) D.A.R.E.® curriculum, which is taught in the 5th or 6th grade, has 17 hour-long weekly lessons. The D.A.R.E.® officers have sole responsibility for teaching all of the lessons, although classroom teachers are encouraged to participate. Officers use a variety of teaching approaches, including the presentation of facts, group discussions, role-playing, and workbook exercises.

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The D.A.R.E.® core curriculum has several primary purposes:

- teach students to understand the effects and consequences of drug use;
- teach them to recognize and resist interpersonal and media pressures to use drugs;
- enhance their self-esteem and assertiveness;
- introduce them to older youth who serve as role models;
- teach positive alternatives to drug use; and
- increase students' interpersonal, communication, and decision-making skills.[9]

Other D.A.R.E.® curricula are targeted toward (a) kindergarten through 4th-grade pupils (15- to 20-minute introductory lessons), (b) junior high students (10-lesson refresher course taught by D.A.R.E.® officers and classroom teachers), (c) senior high students (11 classes on health effects and social consequences of drug abuse), and (d) parents (four or five 2-hour evening workshops). Our focus in this study was the core curriculum.

All of the curricula share a common set of primary purposes and objectives. Each curriculum is periodically updated. An updated version of the core curriculum, for example, was pilot tested in 1993. D.A.R.E.® officers will be trained in its implementation in September 1994. The new core curriculum will add violence prevention as a lesson and use more participatory learning activities.

Insert Box 2 about here

D.A.R.E.® officers and training

Law enforcement agencies exercise considerable discretion in identifying qualified, motivated police officers to be trained as D.A.R.E.® officers. D.A.R.E.® officers must be full-time, uniformed officers with at least 2 years of experience. When selecting candidate officers, local police departments are encouraged to consider each officer's ability to interact with children, ability to organize, and ability to handle the unexpected, as well as whether the officer would provide an exemplary role model.

Selected officers undergo an intensive, 2-week course of at least 80 hours of training. Officers are trained not only in the core curriculum, but also in public speaking, teaching skills, and classroom management. The core curriculum's training course includes opportunities to practice lessons both with peers and in an actual classroom setting.

Once in the field, D.A.R.E.® officer performance is monitored by mentors who observe classroom presentations and evaluate performance. Their performance is directly critiqued by assigned mentors, who are experienced and specially trained D.A.R.E.® officers. Instructors who teach and mentor officers must have taught the core curriculum at least one semester and must attend an additional 40 hours of accredited instruction. Mentors may also use input from school administrators, classroom teachers, health education coordinators, and advisory committees to provide officers with feedback on their presentations.

The time that D.A.R.E.® officers commit to the program varies considerably from one law enforcement jurisdiction to the next. For some officers, particularly those in large urban departments, teaching D.A.R.E.® is a full-time occupation. In departments that serve rural communities, D.A.R.E.® officers administer the program on a part-time basis, devoting the remainder of their time to other law enforcement tasks.

Purpose of the study

D.A.R.E.®'s popularity, as demonstrated by its rapid rate of dissemination and by abundant anecdotal reports of its success, is self-evident. In part because of its preeminent position, policymakers, researchers, educators, and parents are asking a number of fundamental questions about the program:

- How extensively is D.A.R.E.® implemented nationwide?
- What are the basic features common to most D.A.R.E.® programs?
- How is D.A.R.E.® managed and funded at the national, State, and local levels?
- How does D.A.R.E.® compare with other drug use prevention programs in terms of school and community support and satisfaction?
- What is the level of methodological rigor of the outcome evaluations of D.A.R.E.®'s core curriculum conducted to date?
- What are D.A.R.E.®'s short-term effects on drug use by youth, as compared with those of other school-based drug use prevention programs?

To address these and other questions, the National Institute of Justice (NIJ) awarded the Research Triangle Institute (RTI) and the University of Kentucky's Center for Prevention Research (CPR) a grant to conduct an extensive review of the D.A.R.E.® program and to assess its place within the context of the broad spectrum of school-based drug use prevention efforts.

Study objectives

The research team proposed and carried out two distinct types of assessments, the first pertaining to implementation and the second to outcomes or effectiveness. The primary objectives of the implementation assessment were to

- assess the organizational structure and operation of representative D.A.R.E.® programs nationwide;
- review and assess factors that contribute to the effective implementation of D.A.R.E.® programs nationwide; and
- assess how D.A.R.E.® and other school-based drug prevention programs are tailored to meet the needs of specific populations.

The first two objectives for the implementation assessment relate exclusively to D.A.R.E.® The third targets D.A.R.E.®, but also includes other drug use prevention programs.

The primary objectives of the outcome assessment were to

- identify all outcome evaluations of D.A.R.E.®'s core curriculum conducted to date in the United States and Canada;
- assess the methodological rigor of those evaluations;
- examine the nature and extent of the effects of D.A.R.E.®'s core curriculum; and
- compare the effectiveness of D.A.R.E.®'s core curriculum with other school-based drug use prevention programs targeting 5th- and 6th-grade pupils.

Although the first three objectives of the outcome assessment focus exclusively on D.A.R.E.®, the fourth places D.A.R.E.® in a larger context by comparing it with other drug use prevention programs.

In this Research in Brief, we synthesize the most important findings from both of the assessments and present overall conclusions and offer some recommendations. Further details are available in the study's final report.[10]

Description of the study

To achieve the study's goals and objectives, the research team designed a set of research strategies that would yield data pertinent not only to a review and critique of D.A.R.E.®, but also to an assessment of how D.A.R.E.® compares with other school-based drug use prevention programs, and the future directions of these programs.

To this end, we carried out as previously noted two distinct types of assessments, the first pertaining to implementation and the second to outcomes or effectiveness. For the implementation assessment, we collected original data by conducting

- informal interviews and discussions with the coordinators and/or educational advisors of D.A.R.E.®'s Regional Training Centers (RTCs);
- a survey of State D.A.R.E.® coordinators; and
- a survey of drug use prevention coordinators in a representative, stratified sample of school districts that included districts with and without D.A.R.E.®

For the outcome assessment, we reviewed and assessed the published and unpublished short-term evaluations of D.A.R.E.®'s original core curriculum conducted to date. We collected no primary data, but instead studied prior D.A.R.E.® evaluations using meta-analytic techniques.

A description of the methodology by which we conducted the State D.A.R.E.® coordinator survey, the school district drug use prevention coordinator survey, and the meta-analysis may be found in three boxed sections.

Insert Boxes 3, 4, and 5 about here

Findings and recommendations

In this section, we present highlights of the findings from the implementation assessment, followed by key findings from the outcome assessment. Our discussion is organized by some of the questions that guided these two study components. Recommendations based on our findings are in italics.

Implementation assessment

How extensively is D.A.R.E.® implemented nationwide, and how does D.A.R.E.®'s prevalence compare with that of other curricula?

- Over half (52%) of the school districts in the country have implemented D.A.R.E.® in one or more schools.
- The other two most prevalent curricula, Quest and Here's Looking at You, have been implemented in 27% and 24% of school districts nationwide, respectively.
- Demand for D.A.R.E.® will increase substantially in the next 5 years. Over 40% of districts with D.A.R.E.® plan to expand its use, and 21% of those without D.A.R.E.® expressed interest in implementing it.

How does D.A.R.E.®'s implementation vary by such key school district characteristics as geographic region, urbanicity, SES, and minority status?

- The Midwest had the highest percentage of districts using D.A.R.E.® (60%), and the Southwest had the lowest (37%).
- Urban and suburban school districts were more likely to use D.A.R.E.® than were rural districts.
- D.A.R.E.® was equally likely to be used in school districts with varied racial/ethnic composition and high (relative to low) SES.
- *Consideration should be given to strategies to make D.A.R.E.® more accessible to rural and small school districts.*

How does D.A.R.E.® compare with other AOD use prevention programs in terms of support and satisfaction for the programs?

- School district drug use prevention coordinators indicated that support for D.A.R.E.® is very strong among students, school personnel, parents, and the community. Their ratings for D.A.R.E.® substantially surpassed those of other AOD use programs (see Table 3).

Insert Table 3 about here

- Most school district drug use prevention coordinators rated the D.A.R.E.® curriculum and how it is taught as "very satisfactory." They also rated students' receptivity to D.A.R.E.® and its effects on students as very high. These findings contrast markedly with their ratings of other AOD use programs (see Table 4).

Insert Table 4 about here

- Coordinators in districts with a high percentage of minority students were more likely than those in districts serving predominantly white students to rate students' receptivity to D.A.R.E.® as very high.

Is D.A.R.E.® adapted to each community's particular needs?

- Over two-fifths of coordinators of districts with D.A.R.E.®, and over half of the coordinators in school districts with other drug prevention programs, reported at least some degree of adaptation, usually because of local drug availability.

- *Although we recognize that a modest degree of tailoring the program to the specific needs of a particular audience may be appropriate, we recommend that basic fidelity to the curricula be maintained. Otherwise, their integrity will be jeopardized and the various lessons may be implemented haphazardly, without attention to how they contribute to a comprehensive K-12 curriculum.*

To what extent are classroom teachers and parents involved in D.A.R.E.®?

- In 84% of the school districts, teachers were reported to be "actively involved" in D.A.R.E.®

- *We encourage an even more active role for teachers in all D.A.R.E.® curricula and suggest that D.A.R.E.® consider providing co-training and in-service opportunities for officers and teachers together.*

- About half the coordinators reported that parents were actively involved in D.A.R.E.®

- *D.A.R.E.®'s* efforts to reach out to parents through the parent curriculum are commendable. We recommend assigning homework exercises that children must complete with their parents and developing a videotape for parents of D.A.R.E.® students that would include drug use prevention advice.

How are changes made to the D.A.R.E.® curriculum?

- Responsibility for changes to the D.A.R.E.® curricula are assumed by D.A.R.E.® America, as advised by the D.A.R.E.® America RTC Advisory Board.

- A revised curriculum was piloted in 1993. All D.A.R.E.® officers will be trained to administer the revised curriculum, titled "D.A.R.E.® to Resist Drugs and Violence," in September 1994. In 1993, D.A.R.E.® America convened a Scientific Advisory

Board comprising drug prevention specialists who will review relevant drug prevention research findings and make recommendations concerning improvements to the curriculum.

- *It is important that the various D.A.R.E.® curricula be kept up to date in response to new developments in the field of drug prevention research and practice. The D.A.R.E.® America Scientific Advisory Board is charged with accomplishing this objective.*

What is the relationship between D.A.R.E.® and the State departments of education?

- About one-third of the State-level D.A.R.E.® coordinators reported a great deal of communication with their State's department of education and half reported having at least some communication.

- *It is critical that D.A.R.E.'s® ties with education be enhanced. All State D.A.R.E.® programs should retain educational consultants to act as liaisons employed by their departments of education. Further, an appropriate representative of the U.S. Department of Education should be invited to serve as an* ex officio *member of D.A.R.E.® America's RTC Advisory Board to provide guidance on how D.A.R.E.® can be integrated effectively into a comprehensive school-based drug use prevention strategy.*

How can D.A.R.E.® be improved at the local level?

- Although less than half of the drug use prevention coordinators mentioned that their district have a written agreement with local law enforcement, D.A.R.E.® America reports that such agreements are a prerequisite of the program's implementation.

- *All school districts should review these agreements biennially. D.A.R.E.®'s* implementation in the schools should be discussed in these meetings, and the contributions of D.A.R.E.® officers should be recognized.

How adequate is D.A.R.E.® training?

- Recent changes in the D.A.R.E.® core curriculum will require retraining of D.A.R.E.® officers.

- *D.A.R.E.® should consider new methods to provide in-service training, such as interactive video networking or prerecorded videotapes.*

Outcome assessment

What short-term effects do evaluations of the original core curriculum demonstrate?

- D.A.R.E.® is most effective at immediate posttest in increasing knowledge about drug use and in enhancing social skills (see Figure 1).

Insert Figure 1 about here

- D.A.R.E.® had statistically significant, but more modest, effects on attitudes toward drugs, attitudes toward the police, and self-esteem.

- D.A.R.E.® had small effects on drug use, and except for tobacco use none of the effect sizes was statistically significant.

How do D.A.R.E.®'s short-term effects compare with those of other school-based drug use prevention programs?

- D.A.R.E.®'s effect sizes were smaller than the effect sizes for interactive prevention programs emphasizing social and general competencies and using participatory teaching strategies (see Figure 2).[49] Except for knowledge about drugs, the differences were statistically significant.

Insert Figure 2 about here

- D.A.R.E.®'s effect sizes were generally greater, but not significantly different from, the effect sizes for programs emphasizing intrapersonal factors and more traditional teaching modes (noninteractive programs).

What considerations should be taken into account in interpreting the findings of this meta-analysis?

- The higher level of effectiveness of D.A.R.E.® for knowledge compared with drug use is consistent with Tobler's results and other meta-analyses[1,4,5] and supports the conclusion that knowledge is easier to change than behavior.

- Low drug use effect sizes may reflect the relatively low frequency of drug use by 5th- and 6th-grade pupils.

- The other evaluation studies used for comparison may have been implemented under conditions of greater stringency and fidelity, and closer monitoring, than were the D.A.R.E.® programs studied, leading to stronger effects.

- It is possible that the control groups in the D.A.R.E.® studies were exposed to more alternative drug education than were the control groups for other drug use prevention programs.

- The small number of D.A.R.E. and comparison studies precluded examination of factors that could contribute to the observed differences in effect sizes, such as characteristics of the students, features of the interventions, and differences in research designs.

- None of the studies examined such potentially important outcomes as the effects of D.A.R.E.® on violent and delinquent behavior, or on the relationship that develops between D.A.R.E.® officers and youth, or on the officers themselves.

What changes might be considered to the D.A.R.E.® core curriculum and how it is taught?

- *Greater emphasis could be placed in the D.A.R.E.® core curriculum on lessons concerning social influences, which most closely resemble the content of interactive programs.*

- *Less emphasis could be placed on lessons concerning self-esteem, decision-making, and stress reduction, which most closely resemble the content of noninteractive programs.*

- *Traditional didactic teaching styles, which rely on providing information with little response from students, have been shown to be less effective than interactive teaching, which relies on engaging students in dialogues with the teacher and each other. D.A.R.E.® shares aspects of both approaches. The revised core curriculum emphasizes interactive teaching; we suggest that D.A.R.E.® examine ways to engage youth still further.*

Conclusions

Our findings show a program that has been extremely successful at placing drug use education in our Nation's schools. D.A.R.E.® is now implemented in the majority of the Nation's school districts and is expected to grow substantially in the coming years. Its popularity is very high, as is the support it generates. At the same time, however, our findings indicate that the original D.A.R.E.® core curriculum has been less successful than interactive programs in accomplishing its mission to prevent drug use among 5th- and 6th-grade pupils. More work is needed to make D.A.R.E.® as effective as other programs have shown is possible with students who are this age.

D.A.R.E.® represents an institution that is unique in the area of drug use prevention: an active partnership between law enforcement and education. Not unexpectedly, along with this highly visible profile come high expectations. Key to the continued growth and success of D.A.R.E.® will be careful monitoring of the effectiveness of the various curricula, coupled with the willingness to make and assess modifications that could further enhance effectiveness. Continuous work is needed to make D.A.R.E.® as effective as it has the potential to be, such as the recent revisions to the core curriculum and the ongoing oversight provided by the D.A.R.E.® America Scientific Advisory Board. Such changes will result in a program that maintains its unique identity and place in drug use education, while meeting more effectively the challenge of preventing drug use among our Nation's most vulnerable population--adolescents.

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Box 1

Issues and Findings

Discussed in this Research in Brief: Results of an assessment of the Drug Abuse Resistance Education (D.A.R.E.®) Program.

Key issues: Researchers sought to find out how prevalent D.A.R.E.® is nationwide, how it is managed, what educators and others think of it, and what the short-term effects of the original core curriculum are, as compared with those of other school-based drug use prevention programs.

Key findings: The study found that:

- D.A.R.E.® is prevalent in over 50% of the Nation's school districts.
- Demand for D.A.R.E.® will increase substantially in the next 5 years.
- School- and community-based support for D.A.R.E.® are both high, as are support for the D.A.R.E.® curricula and beliefs concerning its positive effects on youth.
- As revealed by the meta-analysis, the original D.A.R.E.® core curriculum had small short-term effects on 5th- and 6th-grade pupils' drug use; only the effect on tobacco use was statistically significant.
- D.A.R.E.®'s greatest short-term effects concern increasing knowledge about drug use and enhancing social skills.
- D.A.R.E.®'s short-term effects on drug use and other outcomes were less than those of programs emphasizing social and general competencies and using interactive teaching strategies, but slightly greater than those of programs emphasizing intrapersonal factors and more traditional, didactic teaching methods.
- All study findings should be interpreted carefully in light of considerations described in the report, including those mentioned on page __. For example, D.A.R.E.®'s low drug use effect sizes may reflect, in part, the relatively low frequency of drug use by elementary school pupils.

The researchers conclude that D.A.R.E.®'s popularity and public support are both very high. The program represents a unique partnership between education and law enforcement and is well managed at the local, State, and national levels. At the same time, the findings indicate that the original D.A.R.E.® core curriculum has been less successful at preventing drug use among youth than some other drug use prevention programs. Additional attention to the curriculum and how it is taught is needed to make D.A.R.E.® more effective.

Target audience: School and law enforcement administrators, school- and community-based drug use prevention practitioners, and researchers.

Box 2

D.A.R.E.® National and Regional Operations

D.A.R.E.® is very much a grassroots operation that is the product of an active partnership between community law enforcement and local public school districts. The primary purpose of the national and regional structure summarized here is to (a) ensure the integrity of the D.A.R.E.® curriculum and the fidelity with which it is delivered; (b) develop and uphold standards for the integrity, coordination, and quality of D.A.R.E.® operations; and (c) provide support to D.A.R.E.® at the community level.

At the national, regional, State, and local levels, D.A.R.E.® is promoted, monitored, and overseen by D.A.R.E.® America, which is chartered as a nonprofit organization. D.A.R.E.® America is charged with administering the D.A.R.E.® program, providing educational materials to communities implementing D.A.R.E.®, overseeing and ensuring the consistency of D.A.R.E.® officer training, improving the curriculum, protecting the D.A.R.E.® name and logo (over which D.A.R.E.® America holds copyright), and providing support to D.A.R.E.® both nationally and internationally.

D.A.R.E.® America also oversees the activities of five Regional Training Centers (RTCs), funded through a grant from the Bureau of Justice Assistance. The responsibilities of the RTCs include making recommendations to D.A.R.E.® America concerning the accreditation of State-level D.A.R.E.® Officer Training Centers and providing oversight to local D.A.R.E.® programs to ensure that copyrighted curricula are taught as specified. Educational specialists representing the five RTCs, together with the Los Angeles United School District, are charged with developing and modifying the various curricula. In this capacity, they are assisted by the recently established D.A.R.E.® America Scientific Advisory Board, which includes prevention specialists from across the Nation.

D.A.R.E.® is organized and supported at the State level by means of chartered nonprofit organizations over which D.A.R.E.® America has oversight, or by individuals (usually State employees) who are designated as D.A.R.E.® coordinators. Their duties include obtaining State support and overseeing policy development and implementation, coordinating D.A.R.E.® officer training, and providing technical assistance to community programs. In addition, most States now have accredited State Training Centers, the purpose of which is to conduct training for prospective D.A.R.E.® officers. With help from D.A.R.E.® America, D.A.R.E.® officers have formed the National D.A.R.E.® Officers Association, which serves to improve communications among officers.

Box 3

Methodology for the State D.A.R.E.® Coordinator Survey

Instrument Design

Our survey instrument was composed of two parts: a questionnaire and a list of school districts. The questionnaire contained items concerning the administration, funding, and implementation of the State D.A.R.E.® program. The list of school districts collected information that was used for sampling purposes in the school district drug use prevention coordinator survey.

We pretested the instrument on three State D.A.R.E.® coordinators in early February 1992 and also solicited feedback from all five RTC coordinators. We incorporated the responses of pretest participants, as well as the comments of the RTC coordinators, the NIJ Program Manager, and other alcohol and other drug (AOD) use prevention program experts.

Data Collection

In January 1992, the RTC coordinators provided us with lists of names and addresses of State D.A.R.E.® coordinators. From the lists we identified 44 States with D.A.R.E.® coordinators and then mailed a survey to each.

Two weeks after our initial mailout to the coordinators, we contacted nonresponders by telephone. We made repeated attempts by mail and telephone to secure the return of completed materials or to collect the information by phone. The RTCs assisted in urging coordinators to return surveys. Of the 44 respondents identified by the RTC coordinators, 39 completed the instrument.

Box 4

Methodology for the School District Drug Use Prevention Coordinator Survey

Sample Design

The survey of the school district drug use prevention coordinators employed a two-phased stratified random sample. This strategy was necessary to meet the multiple goals of this survey. The goal of the first-phase sample was to produce estimates of D.A.R.E.®'s prevalence by region, district size, socioeconomic status (SES) categories, racial/ethnic categories, and urbanicity. The goal of the second-phase sample was to enable comparisons between districts with and without D.A.R.E.®

Sampling frame

As the first step in our sampling design, we obtained a list of public school districts nationwide, which included each school district's SES, urbanicity, racial/ethnic composition, and number of students.

First-phase sampling

The goal of the first phase of our sampling design was to ensure that we selected a nationally representative sample of school districts. Additionally, we wanted to ensure that the urbanicity, SES, racial/ethnic composition, and district size categories were adequately sampled, as well as each of D.A.R.E.®'s five administrative regions. We thus used a stratified random sample to select 1,500 school districts from the 15,000 in the original file.

Second-phase sampling

The goal of the second phase of our sampling design was to ensure that the second-phase sample included both D.A.R.E.® and non-D.A.R.E.® school districts. To make this determination, we asked State D.A.R.E.® or (in States without them) the Drug-Free Schools and Communities Act (DFSCA) coordinators to classify the 1,500 school districts in the first-phase sample as either D.A.R.E.® or non-D.A.R.E.® districts. Because some State coordinators did not return this information or only partially completed the information, we created a third category of school districts with an unknown D.A.R.E.® status. State coordinators reported that 43% of the sampled districts used D.A.R.E.® and 40% did not; D.A.R.E.® status was unknown for 17% of the districts.

The next step in selecting our second-phase sample was to determine the number of districts to be selected. Calculations to determine the number of districts needed in the second-phase sample were based first on the type of analysis we planned to conduct and second on an anticipated 80% response rate. Because we calculated that 400 responding school districts were necessary to achieve sufficient statistical power and precision, we selected a second-phase sample of 500 school districts.

Instrument Design

All drug use prevention coordinators completed a set of core items that were designed to provide background information about the district and about the specific drug use prevention curricula used. Additionally, coordinators in districts using D.A.R.E.®, whether alone or in combination with other drug use prevention curricula, completed a set of items concerning the D.A.R.E.® program only. Coordinators in districts using other AOD use prevention programs, alone or in combination with D.A.R.E.®, completed a set of items concerning other AOD (i.e., non-D.A.R.E.®) programs only. Therefore, school districts implementing D.A.R.E.® and other AOD programs answered both sets of items.

Box 4 cont.

We formally pretested all data collection materials and procedures. Both regional and State DFSCA coordinators assisted in identifying pretest subjects. Seven school district drug use prevention coordinators completed a pretest questionnaire in early April 1992.

Data Collection

In May 1992, we mailed a cover letter, questionnaire, and prepaid return envelope to school district drug use prevention coordinators in each of the 500 selected school districts. The cover letter included a brief statement of study objectives, information on how the data would be used, and confidentiality assurances. Approximately 2 weeks after the initial mailing, we sent postcard reminders to coordinators who had not responded.

We began making follow-up telephone calls to nonresponders approximately 2 weeks after the reminder postcards were mailed. Interviewers encouraged coordinators to complete and return their instruments as soon as possible. Those coordinators who indicated to interviewers that they would not otherwise complete the instrument were asked to complete the survey over the telephone.

Box 5

Methodology for Meta-Analysis of Short-Term Evaluations of Original D.A.R.E.® Curriculum

Meta-Analysis Background and Study Selection Criteria

Meta-analysis is a methodology for integrating the research findings from a body of studies. The purpose of meta-analysis is to discover whether some pattern of results is apparent from a set of studies pertaining to the same research question. Meta-analysis differs from a traditional narrative review of studies by providing statistical techniques for summarizing the studies' research findings. By quantifying outcomes across studies and making them comparable with each other, meta-analysis provides an objective (rather than subjective) basis for drawing conclusions about patterns of study results.

Three basic steps are commonly followed in meta-analyses.[11] First, all relevant studies are collected, and studies are selected for inclusion according to a set of *a priori* defined methodological criteria. Second, effect sizes are calculated for each study. Effect sizes represent the statistical outcomes of each study transformed to a common metric. This transformation facilitates comparisons across different scales of different outcome measures. Third, effect sizes for the set of studies are averaged. In addition, explanations for variability in effect sizes across studies usually are tested. We followed these three steps in assessing D.A.R.E.®'s core curriculum.

In selecting studies, our review focused on student-based, quantitative evaluations of D.A.R.E.® that measured program effects on drug use behavior and/or other outcomes targeted by the D.A.R.E.® core curriculum, such as attitudes about drug use. Evaluations that reported only subjective assessments or satisfaction ratings were outside the scope of this review. We also did not consider the results of parent, teacher, administrator, or D.A.R.E.® officer surveys, which sometimes were conducted as part of the total evaluation effort. It should be noted that many D.A.R.E.® outcomes of importance are possible other than the ones we examined in this meta-analysis, such as improved school and police relations and greater trust in law enforcement among youth.

We identified 18 quantitative D.A.R.E.® evaluations conducted in 12 States and one Canadian province. From these, we selected studies to include in our meta-analysis that met the following criteria: (a) use of a control or comparison group; (b) pretest-posttest design or posttest only with random assignment; and (c) use of reliably operationalized quantitative outcome measures. Quasi-experimental studies were excluded if they did not control for preexisting differences on measured outcomes with either change scores or covariance-adjusted means.[7] In addition, to ensure the comparability of results, we used only results based on immediate posttest. There were an insufficient number of long-term evaluation studies to assess the longer-term effects of the core curriculum adequately. We selected these criteria because they help to ensure confidence in the study results by removing a number of alternative explanations, other than true D.A.R.E.® impact, that could account for outcomes observed.

Box 5 cont.

D.A.R.E.® Studies Selected

Eight of the original 18 evaluation studies met the criteria for inclusion in the review (see Table 1). Each evaluation represented a State or local (e.g., city, school district) effort using either the entire population of schools in a locale or a convenience sample. The number of student subjects in all studies was large; each study included at least 10 schools and approximately 500 to 2,000 students in the combined D.A.R.E.® and control groups. Assignment of D.A.R.E.® to intervention and control groups was by school for all eight studies.

Insert Table 1 about here

A fundamental consideration in reviewing the studies was the equivalence of the D.A.R.E.® and control groups before the intervention. All studies adjusted for pretest differences on outcome measures, which were based on responses to self-administered questionnaires.

To assess the impact of the original D.A.R.E.® core curriculum on youth drug use, as well as on other outcomes targeted by the curriculum, we calculated effect sizes. A positive effect size indicates an effect in the desired direction as a result of the intervention. Based on other meta-analyses of adolescent drug use prevention programs, effect sizes below .15 were considered to reflect a small effect; effect sizes between .15 and .30 indicated a modest effect; and effect sizes above .30 reflected stronger program effects.

For each of the eight D.A.R.E.® studies, we calculated effect sizes to quantify the magnitude of D.A.R.E.®'s effectiveness with respect to six outcomes that reflect the aims of the D.A.R.E.® curriculum:

- knowledge about drugs,
- attitudes about drug use,
- social skills,
- self-esteem,
- attitude toward police, and
- self-reported drug use.

In addition to calculating one effect size for each outcome for each study, we calculated the weighted mean effect size and 95% confidence interval for each type of outcome across the eight studies. The weighted mean provides a summary measure across the eight studies that is useful for indicating D.A.R.E.®'s general effectiveness with respect to each outcome.

Box 5 cont.

Comparison of D.A.R.E.® with Other Drug Use Prevention Programs

To put D.A.R.E.® in the context of other school-based drug use prevention programs, we compared the average magnitude of the D.A.R.E.® effect sizes with those of other programs that target youth of a similar age. Effect sizes for other programs were drawn from a recent meta-analysis conducted by Tobler.[7,8] We obtained Tobler's results for only those programs aimed at 5th- and 6th-grade pupils. Tobler's meta-analysis was selected because it was more similar to our meta-analysis than other meta-analyses of drug use prevention programs.[1,4-6] Like the D.A.R.E.® criteria, Tobler selected student-based quantitative evalutions that included a control or comparison group and used a pretest-posttest design or posttest-only with random assignment. The meta-analyses differed in that Tobler excluded studies that did not measure drug use and that included results from later posttests, whereas only immediate posttests for D.A.R.E.® were considered. In addition, some of Tobler's programs focused on a single drug (e.g., tobacco) rather than on multiple drugs as in D.A.R.E.® , and some 6th-grade students were in middle school rather than elementary school. The collective impact of these differences should be minimal, however. Overall, the D.A.R.E.® and Tobler studies are highly comparable in terms of program focus, study methodology, and target audience.

Insert Table 2 About Here

The evaluation studies included in Tobler's meta-analysis were classified into two categories: *noninteractive* (N=9) and *interactive* programs (N=16). These program categories reflect cross-classification of two important dimensions: the program content and the program process or teaching approach.

Noninteractive programs emphasize intrapersonal factors and use more traditional teaching approaches. Activities typically are designed to increase knowledge about drugs, boost self-esteem, promote self-awareness, increase problem-solving skills, and promote values clarifications. These activities, in turn, are expected to encourage adolescents to make a personal decision to abstain from using drugs. Program content is usually introduced by the teacher in a didactic manner, and participatory activities often involve teacher-led discussions.

Interactive programs emphasize interpersonal factors and use a participatory teaching approach. Activities are designed to counter peer pressure to use drugs through developing drug refusal skills, promoting general social competencies, and correcting beliefs about the prevalence of drug use among peers. Program process emphasizes the interaction and exchange of ideas among peers, and it encourages active participation of all students in the classroom, particularly in small groups.

Because D.A.R.E.® has features of both noninteractive and interactive programs, we compared D.A.R.E.® with both categories of programs. To determine whether differences in effect sizes between D.A.R.E.® and both noninteractive and interactive programs were statistically significant, we calculated the 95% confidence interval for the difference in effect size means.

Table 1. **D.A.R.E.® Evaluation Studies Selected for Meta-Analysis (N=8)**

Location	References
British Columbia	Walker, 1990[12]
Hawaii	Manos, Kameoka, and Tanji, 1986[13]
Illinois	Ennett et al., 1994; Ringwalt, Curtin, and Rosenbaum, 1990; Rosenbaum et al., 1991; Rosenbaum et al., 1992[14-17]
Kentucky	Clayton et al., 1991; Clayton, Cattarello, and Walden, 1991[18,19]
Kentucky	Faine and Bohlander, 1988; Faine and Bohlander, 1989[20,21]
Minnesota	McCormick and McCormick, 1992[22]
North Carolina	Ringwalt, Ennett, and Holt, 1991[23]
South Carolina	Harmon, 1993[24]

Table 2. **Comparison Drug Use Prevention Programs (N=25)[7,8]**

Noninteractive Programs

Study	Location	References
1, 2	Ontario	Allison, Silver, and Dignam, in press[25]
3	Pennsylvania	Dubois et al., 1989[26]
4	Pacific Northwest	Gilchrist et al., 1987[27]
5	California	Johnson et al., 1987[28]
6	California	Moskowitz et al., 1984; Schaeffer et al., 1981[29,30]
7	Michigan; Wisconsin	Sarvela, 1984; Sarvela & McClendon, 1987[31,32]
8	California	Schaps et al., 1984[33]
9	Not stated	Schinke, Gilchrist, and Snow, 1985[34]

Interactive Programs

Study	Location	References
10, 11	Michigan	Dielman et al., 1986; Dielman et al., 1987; Dielman et al., 1989; Shope, Dielman, and Leech, 1988[35-38]
12	Ontario	Flay et al., 1989; Flay et al., 1983; Flay et al., 1985[39-41]
13	New England	Gersick, Grady, and Snow, 1988[42]
14-16	California	Johnson et al., 1987[28]
17	Massachusetts	McAlister, 1983[43]
18, 19	Washington	Schinke et al., 1988[44]
20	Not stated	Schinke & Blythe, 1981[45]
21	Washington	Schinke & Gilchrist, 1983[46]
22	Not stated	Schinke et al., 1986[47]
23	Not stated	Schinke, Gilchrist, and Snow, 1985[34]
24, 25	Not stated	Schinke et al., 1985[48]

Note. Some programs were published in multiple publications. Some publications reported on more than one type of program.

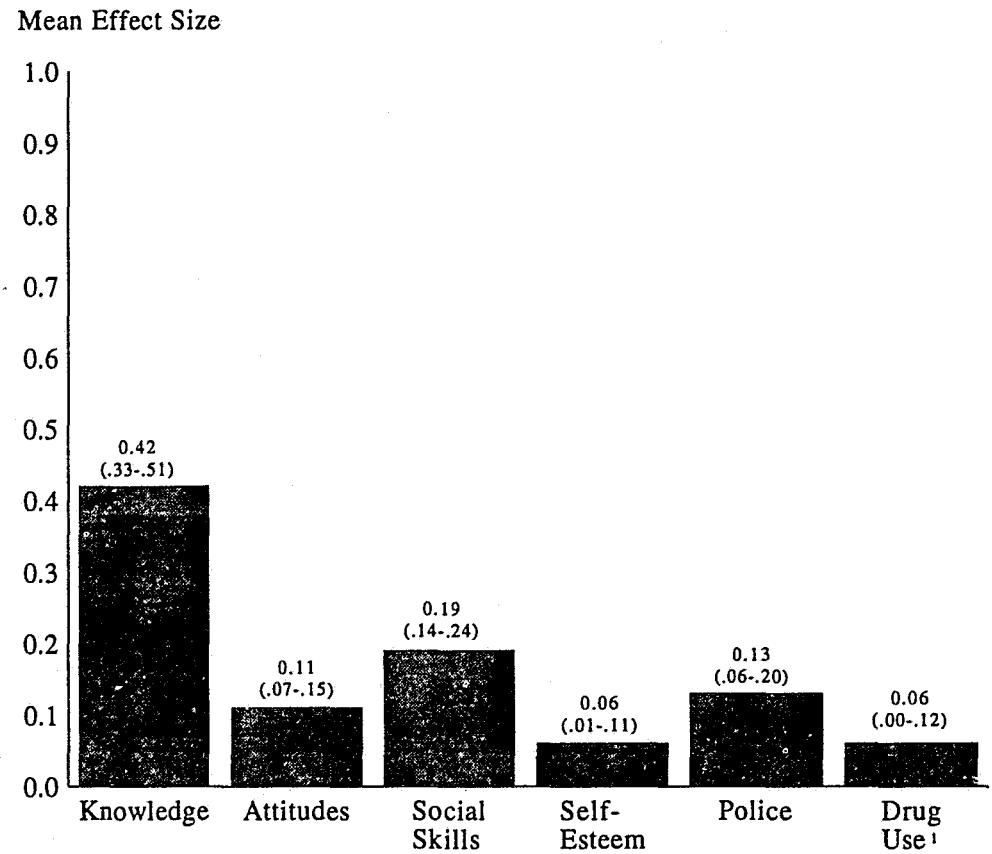
Table 3. **Individuals, Groups, and Agencies Very Supportive of D.A.R.E.® and Other Alcohol and Drug Use Prevention Programs**

	D.A.R.E.® Program (N=222)	Other AOD Use Programs (N=406)
Community	73.8%	46.6%
School Personnel	82.8	65.1
Students	89.6	50.7
Parents	78.7	45.8
Law Enforcement	92.2	66.8
Civic Groups	61.7	46.8

Table 4. **Components of D.A.R.E.® and Other Alcohol and Drug Use Prevention Programs Rated as Very Satisfactory**

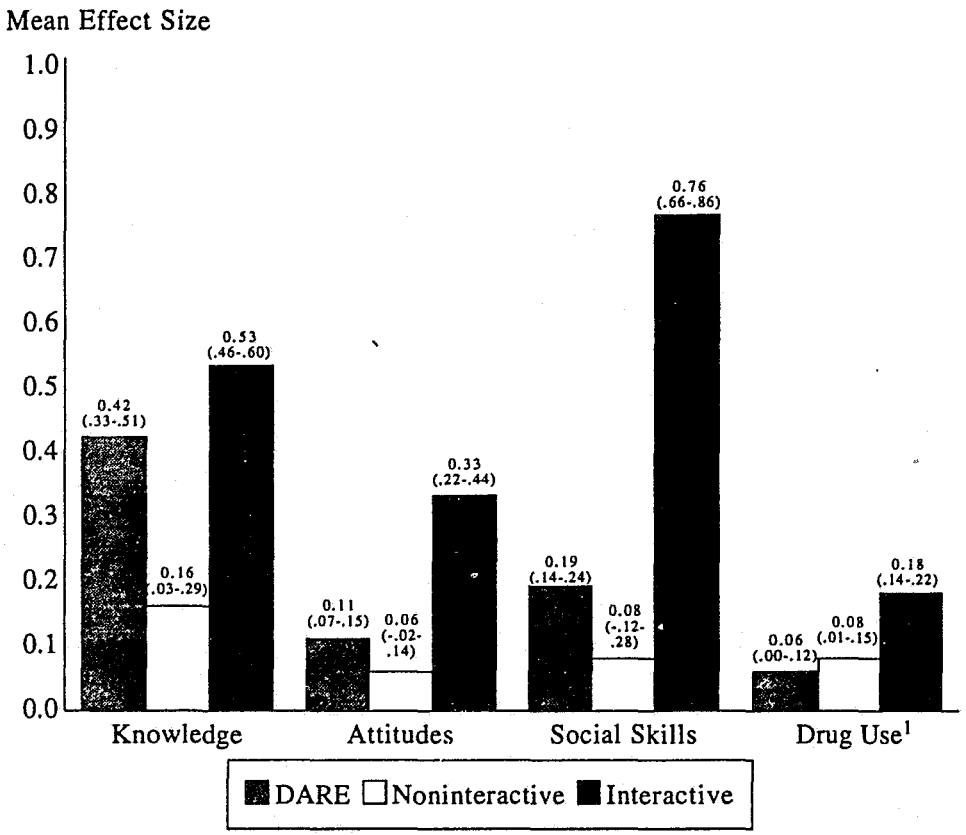
	D.A.R.E.® Program (N=222)	Other AOD Use Programs (N=406)
Curriculum	67.5%	34.2%
Teaching	69.7	29.8
Administrative Requirements	55.7	23.1
Receptivity of Students	76.5	34.6
Effects on Students	63.2	22.8

Figure 1. **Magnitude of D.A.R.E.®'s Weighted Mean Effect Size (and 95% Confidence Interval), by Outcome Measures at Immediate Posttest**



[1] Includes alcohol, tobacco, and marijuana.

Figure 2. **Weighted Mean Effect Size (and 95% Confidence Interval), by Outcome for D.A.R.E.® and Other Drug Use Prevention Programs**



[1] Includes alcohol, tobacco, and marijuana.