

2. EFFECTIVENESS OF EDUCATIONAL INTERVENTIONS TO CHANGE RISKY BEHAVIORS

CERTAIN PRACTICES OF HOMOSEXUAL AND BISEXUAL MEN

Introduction

AIDS was first identified among homosexual and bisexual men and continues to be a disease primarily affecting this group; a total of 63 percent of the reported adult cases in the United States are among homosexual and bisexual men without other known risk factors. An additional 7 percent of cases have occurred among men who are both homosexual and IV drug users (192). Epidemiologic studies have demonstrated that for homosexual men, anal intercourse practiced without the use of condoms is the major risk factor for HIV infection. In one study, unprotected receptive anal intercourse could account for nearly all of the 95 new infections detected among 2,507 initially seronegative men after six months of followup. The gradient of risk of seroconversion accelerated in proportion to the number of receptive anal partners, from about three-fold for one partner to 18-fold for those with five or more partners (1 10). The risks associated with oral -genital, manual -anal ("fasting"), and other sexual activities other than unprotected anal intercourse are unknown. Epidemiologic studies have not been large enough to include sufficient numbers of men engaging in these practices to detect a small relative risk associated with such practices (37).

Safer-sex guidelines generally list the use of condoms during anal intercourse as "possibly safe" rather than "unsafe." Although several laboratory studies have demonstrated that latex condoms are effective physical barriers to HIV, the effectiveness of condoms in

preventing HIV transmission is not established. Data from epidemiologic investigations, however, do show consistent previous condom use to be associated with seronegativity (189).¹The spermicidal agent, nonoxynol - 9, has been shown in the laboratory to inactivate HIV and when used with condoms, may enhance their effectiveness (37).²

The prevalence of infection among homosexual/bisexual men varies greatly by geographic region. In San Francisco, about half of the homosexual men are infected. (New York City may have a similar seroprevalence rate (37).) This level of infection was recognized by the latter half of 1984 and has remained relatively stable (i.e., there have been relatively few new infections) (220). Evidence from epidemiologic studies in San Francisco suggest that by 1988, less than 2 percent of seronegative homosexual men were being infected annually (21 8). The current rate of new infections among homosexual men in some areas of intermediate prevalence also appears to be very low (150). Areas of intermediate prevalence (10 to 30 percent homosexual men infected) include Miami/Fort Lauderdale, Los Angeles, Houston, and Washington, D.C. (37). Seroconversion rates may be higher than these epidemiologic investigations suggest. Participation in studies in which detailed questions about sexual behavior are asked may, in itself, modify risky behavior (37).

The exact size of the population of men at risk for HIV infection because of their

¹ The effect of condom use among the heterosexual spouses of patients with AIDS was evaluated (189).

² Studies designed to estimate the effectiveness of condoms in preventing HIV transmission are underway (37),

homosexual practices is unknown. Although recognized as unreliable, data from the late 1940s (11 1) are usually used to estimate the size of the U.S. homosexual male population. Using these data, the Public Health Service estimated that 4 percent of all males were exclusively homosexual (representing 2.5 million men between the ages of 16 and 55) and a total of 5 to 10 million men had at least some homosexual experience (185).

Changes in AIDS-Related Behaviors

Dramatic AIDS-related behavior changes have been documented within the male homosexual/bisexual community. In fact, the degree and kinds of behavioral changes that have occurred exceed anything documented to date in the public health field (35). The extent of behavioral change, however, varies substantially by geographic area. At one extreme is San Francisco, where a 92-percent reduction in unprotected insertive anal intercourse and a 76-percent reduction in unprotected receptive anal intercourse was recorded from 1985 to 1987 (68). Lesser degrees of behavioral change, however, have been recorded in areas of intermediate prevalence. For example, there was only a 28-percent decline in unprotected receptive anal intercourse among participants of a multicenter study (Baltimore, Chicago, Pittsburgh, and Los Angeles) from 1984 to 1986-1987, with 48 percent of the men still engaged in this practice at last assessment (in April 1986 to March 1987)(78). In January of 1986 and 1987, only 19 percent and 8 percent respectively, of men participating in the San Francisco Men's Study reported unprotected receptive anal intercourse (68). A particularly disturbing finding from a study of men in Pittsburgh is that although 91 percent identified receptive anal intercourse as

the highest risk sexual activity for AIDS transmission and 90 percent endorsed the belief that condoms can reduce the spread of AIDS, 65 percent reported at least one episode of anal intercourse during a six-month period in 1986, and 62 percent of these men reported that they "never" or "hardly ever" used condoms during anal intercourse. Reasons for not using condoms included: condoms are used only by straights (26 percent); condoms are not readily available (22 percent); condoms spoil sex (22 percent); purchasing condoms is embarrassing (18 percent); and using condoms turns partners off (16 percent) (202).

The combination of alcohol or other drugs with sexual activity has been associated with high-risk sex (166). In a telephone survey of homosexual men in San Francisco, those who continued to practice unsafe sex were more likely to combine drugs and/or alcohol with sexual activity. Furthermore, men who combined drugs and/or alcohol with sex were the least likely to have changed the frequency of engaging in unsafe anal intercourse since 1984 (39). In another study, the combination of drugs and sexual activity was found to be the most significant contributor to unsafe sex among a group of New York City homosexual men (more important than perceptions of emotional support and of difficulty in modifying sexual behavior) (164). The National Institute on Alcohol Abuse and Alcoholism (NIAAA) is funding research on alcohol's effect on high risk-behavior among groups at high risk for AIDS (see appendix B).

Homosexual men reporting increases in unsafe sexual practices (i.e., anonymous sexual encounters) appear to hold different beliefs about AIDS than those adopting safer sex. In one longitudinal study in which changes in beliefs and sexual practices were monitored, men reporting increases in unsafe sex were more likely to say that they perceived themselves to be at high AIDS risk than men not engaging in unsafe sex. Men that reported risk reduction were more likely to hold the perception that one's peers were reducing risk, and the belief that one is capable of

3 The proportion of men engaged in unprotected anal insertive intercourse fell from 37.4 percent in January 1985 to 3.0 percent in January 1987.

4 The proportion of men engaged in unprotected anal receptive intercourse fell from 33.9 percent in January 1985 to 8.3 percent in January 1987.

making necessary behavioral changes to reduce risk and/or improve health. Those reporting that their perception of risk for AIDS increased with time did not reduce risky behaviors but did demonstrate a wide variety of psychological impairments. This seems to indicate that using techniques to increase the perception of risk for AIDS may not necessarily have the desired effect on sexual behavior (104, 105). However, it is difficult to establish the temporal association between reported beliefs and behaviors (which came first, the belief or the behavior?) and whether the relationship is causal (i.e., did the change in belief lead to the change in behavior?). Furthermore, these relationships between certain beliefs and risk behavior should not be regarded as static. As the AIDS epidemic progresses, different beliefs can be anticipated to emerge as correlates of risky behavior (37).

Effectiveness of Specific Interventions

Evidence suggests that during the initial period of the epidemic, dissemination of AIDS health information was relatively important, but that later, the acceptance of new behaviors in one's peer network became more important (105). A number of techniques have been employed to change individual risk behavior and community norms. In this section, these programs and their effectiveness are examined.

Community-Based AIDS Risk Reduction Programs

Community-based approaches are aimed at simultaneously providing individuals with information and skills for behavior change and creating a social environment that supports behaviors that prevent the spread of AIDS. Behavioral theory suggests that when specific health-related behaviors become less socially acceptable in a community (and others are sanctioned to take their place), and when perceived social sanctions regarding unhealthy behaviors are persistent and in-

escapable, individuals are much more likely to both initiate and maintain healthful behaviors (37).

The dramatic behavioral change documented in San Francisco has in part been attributed to a shift in community norms resulting from the adoption of a multifaceted, community-based approach (sometimes referred to as the San Francisco model). At least six elements characterize this model: 1) strong leadership from within the homosexual community; 2) market research techniques to identify appropriate messages and communication channels for reaching the target audience; 3) programs to inform and motivate target audiences; 4) a focus on facilitating social and cultural change; 5) reliance on multiple channels of communication including print, broadcast, and face-to-face channels of communication; and 6) broad-scale, grassroots participation. In addition, research was conducted documenting baseline levels of high-risk behavior, changes over time, and the factors related to failure to change (37).

Although many programs have been implemented in San Francisco, few of them have been formally evaluated. Consequently, it is not clear what the relative contribution of the various elements of the San Francisco model have been in changing risk behaviors. Moreover, although community surveys have been undertaken and have documented improvements in AIDS-related knowledge and changes in behaviors, these changes cannot be directly linked to any particular component of the San Francisco model.

The Centers for Disease Control (CDC) is funding AIDS Community Demonstration Projects in six locations across the country (Denver, Seattle-King County, Dallas County, Denver City and County, New York State and City, Long Beach, Chicago) (see project descriptions in appendix B). Although the range of activities employed differs from site to site, the interventions include public health communications to provide factual information about HIV infection and to create the impression that prevailing social norms support changes to lower risk behaviors. The in-

terventions also include antibody testing to provide a cue to change behavior. Finally, the interventions include a variety of methods targeted to individuals resistant to change, individuals requiring additional help or skills to make changes, or individuals who have trouble maintaining the changed behaviors they have adopted. Evaluations of these programs are underway (see appendix B).

Members of risk groups targeted by community-based educational campaigns have reported that they are effective. A campaign to promote safer sexual practices among Montreal's homosexual population included AIDS education activities and condom distribution. In a survey completed one month following the campaign, three-quarters of respondents indicated that the campaign had influenced their behavior; however, 36 percent and 18 percent reported still engaging in active and passive anal intercourse without a condom, respectively(1). There may have been a tendency for some survey respondents to provide socially acceptable responses to the survey.

HIV Antibody Testing

Proponents of antibody testing claim that testing will motivate reductions in high-risk behavior. Opponents have claimed that the risks of discrimination or psychological distress outweigh the benefits of testing and that high-risk persons are motivated to reduce risk of infection without testing.

Several studies have shown that testing appears to considerably reduce levels of high-risk behavior. For example, in a study of over 1,000 homosexual men from the Baltimore/Washington D.C. area, 67 percent elected to learn their HIV antibody status. Those aware of their HIV seropositive status⁵ decreased unprotected insertive intercourse to 42 percent of baseline levels (compared to 59

percent for seronegatives and 52 percent for the uninformed group).⁶ A study of the effects of HIV antibody testing on subsequent sexual behavior among 270 homosexual men in Boston showed that levels of all sexual activities (except the number of steady partners) declined over a one-year period for all men irrespective of awareness of antibody status. Elimination of unprotected active anal intercourse was reported somewhat more often among seropositive men who became aware of their test result and discontinuation of unprotected receptive anal intercourse was reported slightly more often by men who became aware of a negative test result (133). Other studies have also shown significant differences in behavioral change between those informed and not informed of their HIV antibody status (216). In these observational studies, however, subjects chose to be tested and chose whether or not to be informed of their HIV antibody test results. There is some evidence to suggest that men already predisposed to risk-reducing behavior are more likely to choose to know their test result (133).

Not all studies, however, report a positive effect of HIV antibody notification on behavior. In a study of 74 homosexual men in Chicago that had learned of their antibody status, those who were positive and received their results increased receptive anal contact as compared to those who were positive and did not receive their results. In addition, some informed HIV-positive individuals manifested increased mental health problems (104,133). Some researchers have suggested that HIV antibody negative men increase risky activity due to the belief that they are somehow invulnerable to the effects of HIV (128).

⁵ The term HIV seropositive status refers to the interpretation of enzyme immunoassay and confirmatory tests (e.g., Western blot or immunofluorescence assay) as positive for HIV antibodies. Seronegative status refers to the interpretation of enzyme immunoassay tests as negative (186a).

⁶ Because those finding out that they are seropositive are more likely to have been more sexually active and to have engaged in high-risk sex at baseline than those finding out that they are seronegative, the results of these analyses are presented in terms of percent change at follow-up from baseline in the number of persons with whom an individual engaged in unprotected anal intercourse.

Partner Notification

Notifying the sexual partners or needle sharing contacts of those found to be HIV positive may inform a group of individuals that are unaware of their risk of HIV infection. The intention of partner notification is to provide education and counseling to the infected and susceptible contacts and thereby prevent further transmission. Sexual partner notification has been implemented successfully for STDs other than AIDS. Although partner notification would be very difficult when individuals have had large numbers of sexual partners (whose names or addresses might not even be known), it may be especially useful for high-risk seropositive individuals with few contacts in areas of low prevalence of infection.

Different models of partner notification have been adopted. In some States the names of those with HIV positive test results are reported to the State health officials who in turn identify, trace, notify, and counsel named contacts (e. g., Colorado). In other States, health officials selectively follow up contacts who fall into certain groups (e. g., women of child-bearing age, bisexual contacts) (97). Sometimes, the HIV-infected individual has the responsibility of notifying contacts himself and health officials only contact partners if they are asked for assistance. For partner notification programs to be successful, confidentiality of information must be assured. Without assurances of confidentiality, high-risk individuals may avoid testing or fail to report or refer at-risk contacts (106).

A partner notification program instituted by the Colorado Department of Health identified 42 HIV positive individuals from a total of 453 partners reported by 265 HIV-positive individuals. These 42 identified cases had not previously been tested or had been previously tested and found to be negative (37). No behavioral followup was conducted on these or the negative contacts identified through this program.

Face-to-Face Programs

The results of evaluations of two interventions suggest that face-to-face programs with multiple sessions can reduce high-risk behavior. Men with a history of frequent high-risk behavior reported fewer episodes of unprotected anal intercourse following participation in 12 weekly, group sessions covering AIDS risk education, cognitive behavioral self-management training to refuse coercions, and discussions regarding the development of steady and self-affirming social supports than men in a control group (men randomly assigned to a program waiting list)' (108). Other researchers employed an 8-week stress management program and a retreat emphasizing meditation, relaxation, positive health habits, and coping with stress for a group of seropositive men. Again, following the intervention, participants reported fewer partners in the previous month than men in the control group⁸(36).

The STOP AIDS Project, a face-to-face program implemented in San Francisco, although not formally evaluated, was successful in reaching large numbers of homosexual men. The project uses a focus group model to bring people together to engender a personal commitment to safer sex and personal participation toward ending the AIDS epidemic. In a survey of San Francisco homosexual men, over half of the men had heard of the project and 20 percent had attended a meeting. Records show that over 7,000 men have attended a meeting (37). There are no data available, however, regarding the specific impact of the program on behavior.

Conclusions

There have been few formal evaluations of the effectiveness of educational interventions to reduce the risk of HIV transmission

⁷ Program participants reported an average of 0.2 vs. 1.2 episodes of unprotected anal intercourse reported by controls in the previous month.

⁸ Participants reported an average of 0.5 vs. 1.09 partners reported by controls in the previous month.

among homosexual and bisexual men. Evaluations are needed to determine which approaches are effective for homosexual men in general and for men who are resistant to change. Considerable behavioral change has occurred in areas of highest HIV prevalence (e.g., San Francisco); however, a small minority⁹ of men continue to engage in high-risk behaviors there, despite the conduct of a variety of educational interventions.

Analyses of the distinctions between those homosexual men who continue to maintain adopted behavioral changes over time and those who do not will be central to the design of new preventive interventions. Based upon what is currently known regarding the correlates of risky behavior, more work is merited on understanding how high-risk sex is associated with concurrent alcohol and other drug use, beliefs regarding AIDS risk, sexual impulse, and perceptions of personal efficacy and social norms. In addition, research on the social and environmental contexts under which homosexual men do not comply with safer sex can be expected to identify heretofore unsuspected correlates of high-risk behavior.

Specific approaches that could be implemented and formally evaluated include community intervention approaches and face-to-face, multisession programs targeted to those having difficulty adopting or maintaining safer-sexual practices. Although the community-based intervention model implemented in San Francisco may have shifted community norms and contributed to behavioral change, the model needs to be replicated and evaluated in middle and high prevalence cities. The extent of behavioral change in the San Francisco area, in part, may be attributable to the unique characteristics of the population there. Homosexual males in San Francisco, many of them migrants from other areas, tend to be well-educated, professionals, who identify with the homosexual community. In other areas, community leadership

and community networks may be less well defined and the community-based approach more difficult to implement. Beyond providing education and social support, programs could provide the means with which behavioral change can be implemented. For example, methods of making condoms more available to risk groups and evaluations of the efficacy of these programs could be undertaken.

Data Collection and Evaluation

In order to gauge the effectiveness of educational interventions, information on baseline and current behavior of high-risk groups is necessary. Data on prevalent homosexual practices are available from only a few cities.¹⁰ Many cities in the middle-to-high ranges of AIDS prevalence could benefit enormously from better estimates of sexual behavior among homosexual and bisexual men. Such data were collected in San Francisco and used to design educational campaigns, to determine the effectiveness of the programs, and to identify pockets of individuals who were not responding to them (37).

Uniform reporting of data would facilitate comparison of outcomes from different areas. At present, longitudinal studies of AIDS-related behaviors may use different periods of followup (i.e., periods of 1, 3, 4, 6, and 12 months). Furthermore, researchers vary in the detail with which they gather and report behavior. At a minimum, it would be useful for each study to record the frequency of specific sexual activities that are known to be high risk, and to report both mean frequencies (along with standard deviations) and percentages of individuals engaging in these activities at baseline and at followup (37). As a subject's risk of HIV infection varies by many characteristics of the contact (i.e., the HIV serologic status of the subject and partner, the type of sexual contact, whether the subject assumed an active or passive role, and

⁹ An estimated 3 percent of men in the San Francisco Men's Health Study continued to practice unprotected active intercourse and 8 percent practiced unprotected receptive intercourse as of January 1987 (68).

¹⁰ Cities for which data on prevalent homosexual practices are available include San Francisco, Los Angeles, Chicago, Baltimore, Pittsburgh, and New York (37).

condom use), contact-specific, rather than summary reports of risk behavior may be necessary. For example, when high-risk sexual practices are reported, it is important to document the extent to which HIV negative individuals might be selecting only other HIV negative individuals for sexual relations and likewise, HIV positive individuals may be limiting their partners to those that are HIV positive.^{11,12} To understand why condoms are not used during high-risk sexual encounters, it is important to document whether the study subject is himself non-compliant or whether the subject's sexual partner is non-compliant. The types of interventions needed to encourage condom use would differ in the two situations (i.e., motivating the subject to use condoms versus motivating the subject to insist that his partner use condoms). The CDC is developing a uniform data collection format that is to be used by State-funded programs by the end of 1988 (21).

Specific Groups Needing Special Research Attention

Black and Hispanic Homosexual and Bisexual Men --- About half (48 percent) of black or Hispanic adults and adolescents with AIDS are homosexual males (7 percent of these homosexual males are also IV drug users). Of all those at risk for AIDS, black and Hispanic homosexual males may be the least studied. The limited data that are available suggest that race and ethnicity are not significantly related to participation in high-risk sex (37,39,63). Blacks however, appear to be at greater risk for seroconversion than whites (158, 159). More research is needed to explain the higher rates of seropositivity among blacks.

Black homosexual males may be less informed about the AIDS epidemic than their white counterparts. In one community survey in Detroit, only 13 percent of 62 black

homosexual respondents correctly identified that the AIDS virus was transmitted through blood and semen, and only 19 percent were very worried that they might get AIDS (37 percent reported they were not worried about possible infection) (215). Given a relative lack of data regarding minority group members' AIDS-related knowledge, attitudes, and sexual practices, there are few clues about how targeted prevention strategies aimed at alerting minority men to the dangers of certain behaviors might be developed. Furthermore, minority group members' response to available educational interventions has not been adequately monitored.

Individuals with Low Incomes and Low Educational Attainment --- Studies of homosexual and bisexual men have generally included those individuals most likely to respond to educational programs: individuals with moderate to high incomes with college education. Numerous studies have determined that response to knowledge of health risk are correlated with these two variables. Data are needed on the prevalence of high-risk behaviors among members of other socioeconomic strata, so that the appropriateness of current programs for these individuals can be assessed.

Homosexual Adolescents --- Little attention is being given to the problems of homosexual adolescents. There are no specific data on the prevalence of HIV infection among homosexual youth. A study of homosexual/bisexual male teens found that they had an average of 7 sex partners annually, with 45 percent reporting a past history of sexually transmitted diseases. Adolescents who are not yet infected with HIV and who are newly exploring their homosexual lifestyles are among those most likely to benefit from preventive efforts (154).

Bisexuals --- Specific data regarding the prevalence of male bisexuality in the population, the prevalence of HIV infection among male bisexuals, the degree to which this group has been influenced by AIDS risk reduction education, and the potential for

¹¹ Although it is inadvisable for HIV positive individuals to have unprotected anal intercourse, those limiting their sexual partners to individuals who are also HIV positive will not infect previously uninfected individuals.

¹² The MACS study investigators began to record this information, when available, in 1987 (150).

spread of infection to heterosexuals by bisexuals do not yet exist.

IV DRUG USE

Introduction

Intravenous drug users are the second largest group of persons who have developed AIDS in the United States. As of May 2, 1988, the CDC reported 11,045 cases attributed to IV drug use, representing 18 percent of all adult/adolescent AIDS cases. Of these, 80 percent are black or Hispanic (192). An additional 7 percent of adult/adolescent AIDS cases occur among homosexual/bisexual males who also report IV drug use. The prevalence of HIV infection among IV drug users varies by geographic area; rates range from 50 to 60 percent in the New York City area to below 5 percent in most areas of the country other than the East Coast (185).¹³ The potential for further spread of HIV to IV drug users, their sexual partners, and offspring is great. There are an estimated 1.1 million IV drug users in the United States (185), many of them concentrated in large, economically depressed urban areas. The great majority--approximately three-quarters--of IV drug users are male. Most have their primary sexual relationships with women who do not inject drugs. The number of females who do not inject drugs but who are regular sexual partners of male IV drug users is at least half as large as the number of IV drug users (59) or about 550,000.

Most IV drug users use heroin, but a substantial number also inject other drugs, such as cocaine. Stopping drug use or adopting safer drug injection practices will reduce the risk of HIV infection for IV drug users. If IV drug users adopt safer sex practices,

¹³ These estimates are based on blood tests performed at IV drug treatment programs. At any one time only about 15 percent of IV drug users are undergoing drug treatment. Habitual users not in treatment may be at even higher risk. In contrast, the estimated 200,000 intermittent users may be at lower risk (185).

transmission of the virus from IV drug users to others will be reduced.

Sharing HIV-contaminated needles, syringes, and other drug injection equipment is the source of infection for most HIV-infected IV drug users. Prior to AIDS, needle-sharing occurred as part of initiation into IV drug use and as a symbol of positive social relationships among some IV drug users. Furthermore, in many areas drug injection equipment is difficult to obtain¹⁴ and illegal to possess. As a result, drug users are disinclined to carry injection equipment with them; they tend to obtain drugs first and then worry about obtaining the injection equipment (56).

In cities with large numbers of IV drug users, there are "shooting galleries," where a semi-private space and injection equipment may be available for a fee. A single needle and syringe can often be used by many drug users before the needle becomes too worn for further use. In one survey of IV drug users in treatment (conducted over a 19-month period between 1983-1985), 68 percent (131/193) reported engaging in needle-sharing, and they did so during 40 percent of their drug-use episodes (17). The use of shooting galleries has been linked to HIV exposure in several studies of IV drug users (126,161).

Complex interactions exist among drug use, functional status, and sexual activity. Heavily addicted drug users, often physically debilitated, may experience a loss of libido and tend not to be sexually active. For the majority of IV drug users not so heavily addicted, drug use may enhance sexual pleasure and contribute to considerable sexual activity outside of committed relationships (56). Drug use may also lead to a disinhibition effect against safer sex practices. Most IV drug users develop relatively stable relationships with a single partner. In one New York City study, over 90 percent of IV drug users entering treatment reported that they had a

¹⁴ Most States with large numbers of IV drug users require prescriptions for needle and syringe purchase (56).

stable sexual relationship, and the average duration of their relationship was over 5 years (59). The two partners often do not live together, and mutual monogamy is rare. In many cases there is no use of contraception, and the relationships frequently involve children. In one study, IV drug users in treatment reported an average of 2 children (54).

Goals of AIDS Education

Reaching IV drug users with information about AIDS is, in itself, a challenge. Most educational programs have utilized ex-addict outreach workers to provide information relevant to IV drug users in their own communities. Program success appears to depend on imparting new information, providing the means for behavior change, and reinforcing changes in AIDS-risk behavior (56). The establishment of new norms within the drug use community is a desired outcome of AIDS educational efforts. These norms include cessation or reduction of drug injection and if injection continues, using sterile injection equipment and eliminating or reducing the number of persons with whom equipment is shared. To reduce transmission of the HIV virus from the IV drug user to his or her sexual partner, adherence to safer sex practices is required.

AIDS education efforts will not necessarily lead all IV drug users to seek treatment, not all of those who seek treatment will be admitted, and treatment will not immediately be effective for all of those who do enter it. Therefore, AIDS education efforts for IV drug users promote means for "safer" drug injection. Promotional methods include teaching social skills and strategies for refusing to share equipment when injecting, providing information on how to sterilize previously used injection equipment, providing bleach or alcohol for de-contaminating used equipment, and actually providing sterile equipment for injecting drugs. The ready accessibility of means for safer injection, especially when an IV drug user is entering withdrawal, may be the critical factor in the

effectiveness of an educational program. Similarly, condoms provide a means to practice safer sex and can be made easily available through AIDS outreach workers and drug abuse treatment programs.

Effectiveness of Specific Educational Interventions

Substantial knowledge gains and behavioral change occurred within the IV drug use community prior to the implementation of official AIDS education programs. In New York City, for example, many IV drug users not in treatment knew that AIDS was associated with injection of drugs as early as the fall of 1983 (58). They had learned about AIDS from the mass media and from the oral communication networks within the drug use subculture. By 1984, more than half of a group of 59 methadone patients in New York City reported that they had made some change in their injection behavior; they usually reported increasing their use of sterile needles, cleaning their needles more frequently, and reducing the number of persons with whom they would share drug injection equipment. Only 14 percent, however, reported having changed their sexual behavior (82). A later study of IV drug users not in treatment in New York found 41 percent reporting changes in injection behavior compared to 31 percent reporting sexual behavior changes (15).

Knowledge about AIDS, by itself, does not appear to motivate IV drug users to change AIDS-risk behaviors. In one study, the majority of IV drug users were sharing equipment even though over 90 percent of them knew that HIV transmission could occur through sharing equipment (76). Similarly, in a very well-designed study of the effectiveness of an educational program using outreach workers, changes in knowledge were not accompanied by behavioral change (131). This has been attributed to the lack of attention to providing the means of behavioral change; the outreach workers did not distribute bleach or clean equipment and did not

provide access to drug treatment programs (56). The lesson is clear--to facilitate behavioral change, knowledge does not appear to be sufficient. It is likely that the means for implementing changes must also be addressed within the context of the AIDS educational effort. (See table 2-1 for a description of selected interventions and results of program evaluations.)

That is not to say that providing the means for change is sufficient. Providing information relevant to the concerns and misapprehensions of IV drug users must be emphasized. For example, many IV drug users mistakenly believe that as long as they are not sharing drug injection equipment with people who "look sick," they are protecting themselves against AIDS. Consequently, communicating information concerning the long-term asymptomatic carrier status is needed. The likelihood of developing AIDS after exposure to HIV needs to be emphasized. If an IV drug user believes that there is a very low likelihood of developing AIDS after HIV exposure, then motivation to change behavior is not likely to be very strong. Conversely, the belief that all persons exposed to HIV will develop AIDS or the belief that exposure to HIV is the same as having AIDS may create such anxiety that risk reduction efforts will be undermined. Given the exigencies of daily life for an IV drug user, it is unlikely that new risk reduction behavior can always be maintained. Thus, IV drug users must also realize that the occasional slip in risk reduction behavior does not negate the need for continuing risk reduction (56).

Drug Treatment

The IV drug users' most effective method of avoiding AIDS is to stop injecting drugs. For most, this will require formal treatment. Entry into treatment is often associated with immediate reductions in IV drug use, but a single episode of treatment is not likely, by itself, to lead to permanent cessation of drug use. Length of time in treatment is associated with significant reductions in drug use that are maintained over a

long period of time. The lack of availability of suitable drug abuse treatment is a recognized problem. In New York City, approximately 3,000 new permanent treatment positions have been added to the drug abuse treatment system. All of these have been filled, and there continues to be a waiting list of approximately 1,000 persons. Current plans call for an additional 5,000 treatment positions to be opened by mid-1989 (56). The Presidential Commission on the Human Immunodeficiency Virus Epidemic has recommended expanding the capacity and improving the quality of IV drug treatment programs (21 1).

Increasing the availability and accessibility of drug treatment for IV drug users through AIDS outreach programs appears to be effective. A treatment voucher program developed by the New Jersey State drug abuse agency has proven to be effective in extending treatment services to those concerned about the risk of AIDS and in bringing into treatment young black males, a group previously underrepresented in the State treatment system. Over 80 percent of the first 1,000 vouchers distributed by AIDS outreach workers were redeemed for a free episode of detoxification treatment. Over a quarter of those entering treatment through the voucher program went on to longer-term treatment (99). As length of time in treatment is associated with greater reductions in drug injection, this program has probably had a long-term effect on drug injection behavior (56). Surveys of those entering treatment indicate that about half are largely motivated by the threat of AIDS (81).

Bleach Distribution

In some areas, outreach workers, in addition to providing education, are distributing small bottles of bleach that can be used to sterilize drug injection equipment.¹⁶ From 1986 to 1987, outreach workers in San Francisco distributed 15,000 vials of bleach, most

¹⁵ Imposition of patient fees in 1981 resulted in a loss of black males in treatment (99).

¹⁶ Household bleach rapidly inactivates HIV outside of the body (155).

of them to addicts not in treatment. Although the proportion of addicts (in treatment) reporting needle-sharing remained the same (71 percent), needle-sharers reporting "usually" or "always" using bleach went from 6 percent before (in 1985) to 47 percent after (in 1987) the bleach distribution program began. During this period, the proportion never using bleach fell from 76 percent to 36 percent. Despite the apparent success of this community-based outreach program, serological studies showed that the prevalence of HIV positivity among respondents rose from 10 to 15 percent. Consequently, although sterilization is recognized as an important component of AIDS prevention, the researchers recommend other risk-modification measures be evaluated, including more widespread availability of sterile hypodermic needles (31). During the same period, others have found somewhat higher levels of bleach use among San Francisco IV drug users not in treatment (212). Bleach use may be higher among those not in treatment because the bleach distribution program was targeted to those not in treatment. Evaluations of the effectiveness of street outreach efforts in New York City that include the distribution of sterilization agents are in progress (56).

Needle-Exchange Programs

Official needle-exchange programs for IV drug users have not yet been established in the United States. Prior to the onset of the AIDS epidemic, IV drug users in Amsterdam worked with public health officials to set up a needle-exchange system in which drug users could return used injection equipment and exchange it for new equipment without cost. This effort was initiated to reduce the spread of hepatitis B within the IV drug use community. The needle-exchange system operated on a small scale and did not substantially reduce the spread of hepatitis B among IV drug users (26). Concern about AIDS, however, has led to a greater demand for sterile equipment and an expansion of the needle-exchange system. The proportion of IV drug users using the exchange system has increased from less than 10 percent to almost 50 percent (203). The

needle-exchange system did not lead to an increase in drug injection. In fact, evidence suggests that since the implementation of the needle-exchange program, IV drug users in Amsterdam have decreased their frequency of injection; the proportion injecting more than once per day dropped from almost 90 percent to less than 50 percent. This decline in drug injection is attributed to attempts by IV drug users to prevent HIV infection. There are no data to show that the needle-exchange program has reduced the transmission of HIV.

HIV Antibody Counseling and Testing

Some uncertainty exists regarding the impact of IV drug users' learning their HIV antibody status. In some areas, IV drug users who learned their positive antibody status have shown greater risk reduction than those testing negative (29,42). Risk reduction included reducing or eliminating drug injection or, among those continuing to inject, reducing or eliminating equipment sharing. Adherence to safer sexual practices also increased. In some cases, however, attempts at changing sexual practices after learning of positive HIV antibody test results led to the break-up of some long-term relationships (29). Seropositive individuals suffered distress, social isolation, and stigmatization upon learning of their HIV test results, but distress declined over a period of several weeks.

It is unclear whether learning individual test results, per se, led to the observed behavior change. A comparison group of untested individuals from the same drug abuse treatment program showed comparable risk reduction to those who were tested (29). Thus, it may be that increased awareness and personal concern about AIDS among IV drug users in the local area stems from knowing that personal risk information is available and knowing persons who test positive rather than from individuals' learning their own antibody status (56).

Some have advocated antibody testing for IV drug users for cities in which HIV seroprevalence among IV drug users is low (31). In San Francisco, for example,

voluntary antibody testing has been made widely available. A concerted effort is made to provide medical care to seropositive individuals, to place them in treatment, and to counsel them intensively regarding equipment sharing and safer sexual practices. This strategy is based on the traditional public health approach of locating infectious persons and then intervening to prevent transmission from those persons to others. In San Francisco, where this strategy has been implemented, an estimated one-third of IV heroin users have been tested in the first two years of the program. There are no available data on how HIV antibody testing in San Francisco has affected IV drug users' risk behaviors.

Preliminary data from one area¹⁷ where this strategy was implemented suggest that education contributes more to changing drug use behavior than knowledge of ones' HIV antibody testing results. An investigator compared the risk behaviors of three matched¹⁸ groups of 25 IV drug users in treatment and provided with AIDS education; those who had been tested and learned that they were HIV antibody positive, those had been tested and learned they were HIV negative, and those who had elected not to be tested. After three months of followup, 18 of aware seropositive IV drug users returned to drug use despite the opportunity to receive methadone maintenance, long-term counseling, and medical followup. Ten of these HIV seropositive IV drug users, however, returned to treatment by nine to 12 months of followup and by this time, positive changes in drug use behaviors had been adopted by all three groups. Evaluations of innovative models aimed at changing the risk behaviors of those identified as seropositive are needed (124,125). The National Institute on Drug Abuse is funding AIDS Comprehensive Community Outreach Demonstration Projects that include evaluations of HIV antibody testing programs (see appendix B).

Changes in Sexual Behavior

There have not been substantial changes in sexual behavior among IV drug users, especially with sexual partners with whom the IV drug user has a long-term relationship. In studies where both drug and sex behaviors were monitored, changes in sexual behavior lag behind changes in drug-use behaviors. For example, in San Francisco, while reported use of bleach to sterilize drug injection equipment rose from 3 to 67 percent before and after a community-based outreach program was implemented, reported "safer sex" practices increased only slightly, from 5 percent to 15 percent (212).

Drug users have reported reductions in their number of casual sexual partners and increased use of condoms with casual partners. Male IV drug users have also reported changes in their use of prostitutes. They are more likely to use condoms when with a prostitute, more likely to select a "regular" prostitute rather than seeing many different prostitutes, and more likely to insist that the prostitute they use "look clean" and in apparent good health (56). The least amount of AIDS-related behavioral change has occurred within long-term, committed relationships. This may be explained by the threat to the relationship that behavioral change may pose. In a study of antibody testing, in which HIV seropositive individuals were strongly counseled to use condoms, about half of the long-term relationships dissolved after the IV drug users introduced condom use into the relationship (29). New counseling approaches appear to be needed to assist IV drug users in initiating and maintaining safer sexual practices within their long-term relationships. It is within the long-term relationship that transmission of HIV is most likely to occur, to both the sexual partner and to children likely to be conceived because of a lack of contraception.

¹⁷ The experience of a small-sized city in a non-metropolitan area in New England is reported (124).

¹⁸ IV drug users were matched by age, sex, and drug use (124).

Preliminary data from one investigator suggest that providing one-on-one counseling to seropositive IV drug users and their primary sexual partner is effective. Marlink reports that seropositive IV drug users in treatment significantly increased their reports of “always” using condoms after participating in one-on-one counseling with their sexual partner. A comparison group of IV drug users in treatment who were either HIV antibody negative, or who had elected not to be tested, did not increase reports of “always” using condoms. Because IV drug users in the comparison groups did not have partner counseling, it is not clear what the relative contributions were of the counseling intervention and knowledge of HIV antibody status (125).

Conclusions

Evidence suggests that IV drug users have changed their behavior to reduce their chances of developing AIDS. Behavioral change depends upon learning that they are at risk for AIDS and the ways the disease is transmitted. Risk reduction also depends upon the availability of means for behavior change. Means may include drug abuse treatment and equipment sterilization methods or clean injection equipment. Behavioral theory suggests that sustaining behavioral change requires reinforcement through a belief system that the new behavior is effective in preventing AIDS and through social approval from peers (56).

No single intervention appears to have maximal effectiveness, even within a single geographic area. Instead, most programs have relied on multiple approaches. Reinforcement of risk reduction is needed for a successful AIDS education program. Here, peer approval of behavioral change may play an important role. The decision to engage in AIDS risk reduction is sometimes made within a group context rather than by IV drug users individually. In one study, whether or not friends were practicing AIDS risk reduction was the strongest predictor of behavioral change (82). This finding is not

surprising in light of the importance of peer approval in IV drug use initiation, injection equipment sharing, and drug abuse treatment programs.

To evaluate the effectiveness of interventions in terms of reduced HIV infection, cohort and ongoing seroprevalence surveys will be needed. To supplement these studies, continued ethnographic research is required to monitor behavioral responses to interventions. Ethnographic research (observations of a group's beliefs and practices by trained observers) has yielded invaluable insight into drug use behaviors and patterns of social and sexual relationships that suggest new approaches to educational intervention. For example, the evident importance of peer group approval suggests that interventions aimed at a group of IV drug users rather than at individuals might be effective. Similarly, the lack of significant change in sexual practices among IV drug users and their long-term partners suggests a need for involving sexual partners in counseling. Once promising interventions have been identified for implementation, rigorous methods (e.g., experimental or quasi-experimental designs) need to be employed to evaluate their success.

The threat of AIDS appears to have motivated many IV drug users to seek treatment. Research is needed to determine the long-term effectiveness of treatment programs for the increasing number of IV drug users entering them. In addition, as some IV drug users are at risk of AIDS because they inject drugs other than heroin, types of treatment that may eliminate or reduce their habits are needed.¹⁹

When drug abuse treatment is not effectively utilized, methods of safer injection need to be adopted to reduce AIDS risk. Both distribution of sterilization agents and needle-exchange programs have been implemented in different areas. It appears that both approaches have been accepted by more

¹⁹ Most IV drug users in treatment programs are heroin users for whom methadone is effective in curbing the incentive to use heroin.

than half of IV drug users in the affected areas. HIV transmission continues to occur, however, in areas where outreach workers have effectively distributed bleach. Although needle-exchange programs remain controversial in the United States, their comparative worth or the effectiveness of using both interventions simultaneously could be evaluated.

For areas where there are few infected IV drug users, the strategy of making voluntary HIV antibody testing easily accessible and providing intensive followup for those identified as positive needs to be evaluated further. Preliminary data from one study of this approach suggest that providing education to IV drug users in treatment alters risky drug taking practices irrespective of HIV antibody status. More information on the social consequences of being identified as seropositive and its effects on behavioral recidivism is needed, especially in light of evidence that IV drug users in treatment may return to drug use soon after learning of their HIV infection (124). Furthermore, evaluations are needed of innovative approaches to providing education and counseling to participants of voluntary HIV antibody testing in areas of both low and high HIV prevalence.

Particular attention needs to be paid to educational interventions aimed at changing the sexual behaviors of IV drug users. Although some changes have occurred, they are modest in comparison to changes in IV drug-related behaviors. Of special concern is the observation that changes in sexual behavior have been less frequent within committed relationships than within casual sexual relationships. Without changes in condom use and use of other forms of contraception, heterosexual partners will be infected and perinatal transmission may occur, since child-bearing is more likely within longer-term relationships. Preliminary data from a study of one-on-one counseling of HIV seropositive IV drug users in treatment with their sexual partners suggest that this technique is very effective in promoting condom use (125). Further research in this area is needed.

IV drug use is associated with much of the AIDS transmission among blacks and Hispanics in the United States. Consequently, culturally sensitive educational approaches are needed for these groups. What is known regarding the geographic distribution of AIDS cases should help to target these efforts. For example, almost two-thirds of black (58 percent) and Hispanic (61 percent) adults who have AIDS live in three States--New York, New Jersey, and Florida. Among Hispanics affected by AIDS in the northeastern United States, 80 to 90 percent were born in Puerto Rico (94). There are few data regarding differential impact of interventions on specific racial/ethnic groups (83) or on specific age/drug use groups (e. g., young IV drug users with relatively new drug habits vs. older IV drug users with longer-term drug habits) (55).

CERTAIN PRACTICES OF HETEROSEXUAL ADULTS

Introduction

Heterosexually Transmitted AIDS Cases

There is controversy surrounding the degree of risk that the AIDS epidemic poses to the heterosexual community. There are few recent data regarding either the prevalence of high-risk, AIDS-related behaviors, or the extent of infection among heterosexuals. According to the CDC AIDS case surveillance data, 4 percent of AIDS cases reported to date (2,463 of 59,897 adult/adolescent cases as of May 2, 1988) represent those transmitted via heterosexual contact (192).²⁰ Although a small proportion of all cases, heterosexually transmitted cases represent the fastest growing segment of AIDS cases.

²⁰ These include 1,003 persons without other identified risks who were born in countries in which heterosexual transmission is believed to play a major role.

The cumulative incidence²¹ of AIDS cases in heterosexual adults and adolescents is highest (above 1 case per 10,000 population) in four States/areas: New York, New Jersey, the District of Columbia, and Florida (185). Most of the heterosexually transmitted cases in these areas arose as a consequence of sexual contact with infected IV drug users (56). There are a disproportionate number of minority group members represented among heterosexually transmitted AIDS cases--69 percent of cases occur among blacks and 14 percent among Hispanics.

The characteristics of AIDS cases do not necessarily give an accurate depiction of who is now at risk of developing AIDS. Because the period between infection and onset of symptoms of disease may be seven years or longer, the characteristics of AIDS cases are those of a group who engaged in high-risk behaviors several years ago. To understand the future spread of AIDS among heterosexuals, it is important to have information regarding HIV infection and on the occurrence of high-risk behaviors among a group of heterosexuals representative of the general population.

The Prevalence of HIV Infection

There are no data on the prevalence of infection among a group of heterosexuals that are similar to the general population of United States heterosexuals. Instead, seroprevalence data from testing programs within the military and blood donor programs are used to estimate infection rates within the low-risk heterosexual community (individuals at known risk of AIDS are asked not to donate blood), and data from voluntary HIV antibody testing programs and STD clinics have been used to estimate infection rates within high-risk heterosexual populations. In addition, newborn surveillance programs have served as indicators of infection among reproductive-age women. According to blood donor testing data, the prevalence of HIV in-

fection for first-time donors is 4.3 per 10,000²² (185). Infection rates among heterosexuals attending STD clinics and not admitting to AIDS risk behaviors²³ are as high as one percent (185). In Massachusetts, where blood from newborns was tested for HIV antibodies in 1986 and 1987, 2.1 per 1,000 mothers of neonates were determined to have been infected. In inner-city hospitals, 8 per 1,000 women were infected (92).

To improve estimates of HIV infection within the general community, the CDC is conducting seroprevalence surveys in hospitals, family planning and STD clinics, drug treatment centers, and other sites located in both high- and low-risk areas (129).

The Prevalence of High-Risk Behaviors

There are very poor data available on the sexual behavior of the American population. The data on sexual behaviors collected by Kinsey in the 1940s are recognized as flawed because investigators did not use probability sampling, and because respondents were disproportionately drawn from the Midwest and college campuses (143). A national survey of American adult sexual behavior is being conducted²⁵ and information from a representative group of 20,000 adults should be available by mid-1989. Preliminary data on a sample of 2,000 adults should be available by fall 1988 (28). The results of a survey of sexual attitudes and behaviors of over 3,000 American men and women conducted for the Kinsey Institute in 1970 were never published and the survey data has only recently been made available to researchers (19).

²² Data are based on HIV antibody tests performed on blood donations from 1985 to 1987.

²³ Risk behaviors included homosexual contact, IV drug use, and known sexual contact with a person from these groups. When self-reported risk behaviors of HIV seropositive individuals attending STD clinics were confirmed with a reinterview after testing, HIV infection rates among those not admitting to risk behaviors ranged from 0 to 1.2 percent.

²⁴ Antibodies in maternal blood are contained in neonatal blood specimens routinely collected for other purposes, such as screening for phenylketonuria (92).

²⁵ The survey is being conducted by the National Opinion Research Center with support from the National Institute of Child Health and Development (NICHD), and the CDC, National Center for Health Statistics (28).

²¹ The cumulative incidence of AIDS cases is the total number of reported AIDS cases in an area divided by the number of individuals in the area at the onset of the epidemic.

Some regional data have been collected regarding high-risk heterosexual behavior. For example, a survey was conducted in 1986 using a probability sample²⁶ to estimate the size, demographic composition, and sexual behavior of the multiple/high-risk partner heterosexual population²⁷ in San Francisco (38). Results indicated that approximately 17 percent of San Francisco adult residents are heterosexuals with multiple or high-risk sex partners (58 percent of them men and 42 percent of them women).

Sexual practices, attitudes about risk of HIV infection, and sources of AIDS information reported by this group of "high-risk" heterosexuals, while limited to the unique population of San Francisco, offer some insight into what kind of educational programs targeted to this risk group might be effective. The survey revealed that although risk group members were very sexually active, with many reporting partners in AIDS risk groups, less than one-third reported feeling personally threatened by AIDS. Nevertheless, sizable numbers of heterosexuals at risk for AIDS reported that they had reduced their number of sex partners and decreased anal sex since the onset of the epidemic. High-risk heterosexuals are also at risk for AIDS because of IV drug use. At least eight percent of risk group members reported having used IV drugs, with two percent having done so in the six months immediately prior to the interview. In addition, alcohol and drug use prior to sexual encounters was associated with engaging in higher-risk sexual practices (38).

Overall, the importance of reducing the chances of contracting or spreading AIDS was rated highly, 8.4 on a 10-point scale. Few believed that "using a condom is a turn-off,"

²⁶ Probability sampling is a technique that yields a study group that is representative of the area.

²⁷ This population consisted of adults (aged 18 or older) reporting two or more sex partners of the opposite sex for the last year, or opposite sex partners whom they believed to be IV drug users. In addition, men were included if they had sexual contact with a female prostitute in the previous year and women were included if they had sexual contact with a male prostitute or bisexual male partner in the previous year.

and condom-resistant attitudes were held by one-quarter of respondents. Approximately three-quarters of respondents indicated they were familiar with the concept of safer sex. There was less awareness of safer sex among blacks and Hispanics, however. The level of enjoyment of unsafe practices was correlated with respondents' sexual behavior, which suggests that a communication strategy of emphasizing the pleasurability of safer sex may be an effective way to bring about behavioral change. Beliefs about social norms regarding specific sex practices were not strongly linked with sexual behavior (38).

Only 20 percent of risk group members reported seeking specific information on how to reduce their risk of getting AIDS. Most have relied on their physicians or friends as sources of information. There was considerable interest expressed in workplace-focused educational programs, particularly among less well-educated risk group members. Thirty-one percent said they would attend a risk-reduction presentation during lunchtime or after working hours at their place of employment. Twenty-six percent indicated they were likely to call a toll-free AIDS information hotline. Health professionals and the media were identified as preferred sources of information. Eighty-eight percent approved of the use of sexually explicit risk-reduction messages.

Although over two-thirds of respondents were aware that antibody screening was available, only 5 percent indicated that they had been tested. Only 22 percent stated that they were likely to use the test in the future. Relatively low levels of test use are explained by the perception that heterosexuals are not at risk for AIDS.

Although the findings of this survey conducted in 1986 may be dated, there are some important lessons to be learned regarding educational interventions targeted to high-risk heterosexuals.

- o Educational interventions that increase the high-risk individual's perception of

risk may increase their solicitation of HIV information and use of the HIV antibody test.

- 0 There is considerable overlap in risk behaviors. Therefore, educational efforts may be effective if simultaneously directed at changing sex and drug use practices. Controlling alcohol and drug use may increase compliance with safer sex recommendations.
- 0 There is interest in AIDS educational efforts located at the worksite and at family planning and STD clinics. Hotlines were named as useful sources of AIDS information.
- 0 Educational approaches that emphasize pleasure associated with safer sex might be effective. Explicit risk reduction messages may be useful.

Because the high-risk heterosexuals surveyed were identified through a probability sample, investigators can generalize findings to the high-risk heterosexuals of San Francisco who are estimated to comprise 17 percent of the population. Given the unique characteristics of San Francisco, however, the findings may not be generalizable to other areas in the country. The results of a followup survey of high-risk heterosexuals conducted by the same group of investigators should be available in mid 1988 (145). With this survey, any temporal changes in sexual attitudes and behaviors will be documented, but only for San Francisco.

Effectiveness of Specific Educational Interventions

Persons attending STD clinics and sexually active women of childbearing age (i.e., those with multiple or at-risk partners, or with a history of drug use) are two groups of high-risk heterosexuals that have been identified for AIDS prevention activities (183). In this section, what is known about the effectiveness of education and counseling interventions relevant to adult members of these groups is reviewed. In the next section,

the effectiveness of interventions targeted to adolescents is discussed.

Persons Who May Have Sexually Transmitted Diseases

Individuals infected with sexually transmitted diseases (STDs) other than AIDS are at increased risk of HIV infection by virtue of their sexual practices (e.g., multiple partners) and because open genital lesions present in some STDs facilitate HIV transmission (123). In light of the similarities in risk-reduction services related to STDs and HIV infection and the high-risk nature of the population served by public STD clinics,²⁸ CDC has targeted these sites for AIDS educational and testing activities. In fact, an estimated 42 percent of all HIV antibody testing and counseling centers are located in STD clinics (123).

Education provided at STD clinics can reach a large number of high-risk individuals; approximately half of all annually reported cases of STD are treated within the nearly 3,500 public STD clinics (123).²⁹ Of considerable concern are recent STD surveillance data indicating that the number of new STD cases is increasing. For example, through the first 46 weeks of 1987, there was a 32-percent increase in the number of cases of infectious syphilis reported as compared to the same period in 1986. A marked increase of syphilis was noted among inner-city, heterosexual, minority group members suggesting that high-risk sexual activity is increasing in these groups despite the risk of HIV infection (187).

To date, no specific AIDS education programs offered within STD clinics have been formally evaluated (123). The CDC's Division of STDs is providing funding to Innovative Projects for Risk Reduction, AIDS Prevention Projects to the States, and AIDS

²⁸ Sociodemographic characteristics of public STD attendees are similar to those of heterosexually transmitted AIDS cases, both tend to be young, urban, heterosexual individuals from lower socio-economic groups (123).

²⁹ These clinics manage approximately 5 million patient visits a year (123).

Community Demonstration Projects. Grant recipients are conducting program evaluations that should be completed in late 1988 or in 1989 (see appendix B).

Given the similarity in risk reduction messages imparted to prevent HIV infection and other STDS, it is instructive to look at evaluations of innovative educational approaches aimed at preventing STD infection. Pertinent to the conduct of AIDS education are those interventions that attempt to improve knowledge of STDs and their prevention, to change attitudes regarding prevention, to alter high-risk sexual practices, to improve return-to-clinic rates, and to improve client referral of potentially infected partners. Examples of educational approaches that have been evaluated include the use of printed educational materials, videotapes, programmed learning guides, in-depth face-to-face discussions, self-administered behavioral checklists, condom distribution, clinician-patient contracts, and patient referral cards (see table 2-2 for a description of, and results from, evaluations of STD clinic educational interventions). Several of the evaluation studies employed designs (e.g., randomized clinical trials) and included sufficient numbers of clinic patients to derive statistically meaningful results. Most studies, however, were conducted in the mid-to-late 1970s in unique localities, a factor limiting the generalizability of results.

To improve knowledge related to STDs, one group of investigators (7) evaluated the relative effectiveness of a programmed learning guide, an audiovisual technique, and a person-to-person interview. The three interventions accounted for a 20-percent increase on post-test knowledge scores, and the interview technique was the most effective.

Interventions aimed at changing attitudes have also been effective. In one study, men and women were urged to use condoms or to encourage their partners to do so through the use of videotapes, in-depth discussions, informational checklists, and free condom distribution (66). There were marked differ-

ences in attitudes compatible with prevention between those exposed to the interventions and the control group (71 percent of individuals in experimental groups demonstrated attitudes compatible with prevention compared with 33 percent of those in the control group). Unfortunately, there are no data in either this study or the former study regarding actual changes in behavior.

The results of two studies in which the effectiveness of an educational intervention was measured in terms of evidence of behavioral change are not encouraging. In one descriptive study (the behavior of a group of clinic attendees were described before and after the implementation of the educational intervention without the use of a comparison group), the acceptance of free condoms at the STD clinic did not reduce the number of returns to clinic with another STD as compared with those that did not accept the condoms (47). In another study, a group of men experiencing a gonorrhoea reinfection (i. e., they did not comply with behavioral recommendations) were randomly assigned to a special counseling intervention or to a control group (171). The rate of gonorrhoea reinfection among men in the special intervention group was the same as that observed in the control group.

In terms of motivating patients to return to the clinic for followup, one study showed that provider performance was very influential (11 8). In the study, the effect of new educational materials and the use of patient-clinician contracts outlining preventive patient behaviors were evaluated. Although rates of return improved for women (pre - intervention, 35 percent vs. post-intervention, 73 percent), the return rate for men was similar before and after (33 percent and 37 percent) the interventions were initiated. During a two week period, patient/clinician interactions were directly observed to see if the new educational materials were being used. During this two week observation period, patient return rates were very high; 67 percent for men and 97 percent for women, suggesting that improved provider per-

formance³⁰ was responsible for the improvement (123).

These studies suggest that special educational interventions can improve STD-related knowledge and can affect attitudes toward preventive behavior. Here, the person-to-person interview appears to be relatively more effective than other methods. Results have not been encouraging from studies that have attempted to measure actual changes in risk behavior. Neither distribution of free condoms nor special counseling was effective in reducing STD reinfection. Provider performance, however, may influence compliance with a recommendation to return to clinic. Interventions aimed at maintaining high levels of provider performance may be effective in improving patient knowledge, attitudes, and compliance with behavioral recommendations.

Sexually Active Women of Childbearing Age

Although most adults with AIDS are men (92 percent), women represent the fastest growing segment of the population with AIDS. Seventy-one percent of women with AIDS are black and Hispanic (86). One-half (51 percent) of women with AIDS are IV drug users and nearly one-third (29 percent) contracted the disease through sexual contact with an infected male (most of whom contracted AIDS through IV drug use) (192). Clearly, curbing IV drug use among women and changing the sexual practices of IV drug users would reduce HIV transmission among women.

Researchers and practitioners attending a recent workshop³¹ concluded that “while educational campaigns featuring brief, clear information are a first step, increased knowledge by itself does not lead to needed behavior change (177). Changing women’s sexual behaviors may require interventions that

“empower” women to have more control within their sexual relationships. For example, interventions that help women assert themselves with their sex partners or develop communication skills effective in getting their partners to consistently and properly use condoms and engage in other safer sex practices may be effective. Although studies of such approaches are currently underway, there are no published data regarding the effectiveness of these approaches.³² In addition to approaches to help women initiate change, other interventions, such as support groups, may be needed to sustain behavioral change.

Recognizing that high-risk, reproductive-age women may be reached through federally-funded family planning clinics,³⁴ Title X funds have recently been made available to support AIDS-related educational activities (27). CDC also funds risk-assessment, and risk-reduction counseling, and HIV testing for women in family planning clinics (21). One educational needs assessment conducted within a San Francisco family planning clinic in 1987 revealed that such clinics serve a population at high risk for AIDS; of 545 women aged 13-49 surveyed, 7 percent reported using IV drugs, 10 percent reported sex with a bisexual male, 9 percent reported sex with an IV drug user, 34 percent reported multiple sexual partners, and 30 percent reported sexual intercourse with a partner whose sexual history was unknown. Despite the high prevalence of risk behaviors, more than half (55 percent) reported that their sexual partners “never” use condoms (148). A 1987 statewide survey of women attending Planned Parenthood clinics in Pennsylvania revealed that 1.5 percent were

30 Provider performance is thought to have improved as a result of having an observer present during the patient/clinician encounter.

31 The workshop, “Women and AIDS: Promoting Healthy Behaviors,” was cosponsored by The National Institute of Mental Health and The National Institute on Drug Abuse.

32 For example, J. Mondanaro is using empowerment techniques in interventions targeted to partners of IV drug users and prostitutes (see description of her NIDA-funded project in appendix B).

53 The potential untoward consequences of increasing the assertiveness of women in dependent relationships must also be monitored (e.g., physical abuse of prostitutes byimps).

54 Title X provides family planning services to 4.3 million sexually active women annually. Most of these women are young, many are members of minority groups, and 85 percent are members of low-income families. These women are thought to be at high risk of HIV infection (27).

IV drug users and 4.3 percent were sex partners of IV drug users (21).

Within family planning clinics, evaluation research in the following areas would assist in developing effective educational programs: evaluation of protocols for risk assessment that may be used as a part of client education; evaluation of acceptance of AIDS counseling and testing offered on site vs. upon referral; evaluation of various counseling approaches (individual and group counseling, support programs for infected and non-infected high-risk women); evaluation of client contraceptive choices following AIDS counseling and testing; and evaluation of the provision of contraceptive services on an outreach basis to IV drug use clinics/programs (135).

In an effort to prevent perinatal transmission of AIDS, the CDC has recommended that all women of childbearing age with identifiable risks for HIV infection be routinely counseled and tested³⁵ for HIV antibodies (183). As part of this effort, AIDS-risk assessment, education, and counseling could be conducted at a number of clinical facilities serving women including physicians' offices, family planning clinics, STD clinics, drug treatment clinics, Women, Infants, and Children Program (WIC) clinics, and prenatal clinics (32). The CDC is funding several Perinatal AIDS Prevention Community Demonstration Projects that include evaluations of how well women at risk of HIV infection are identified and how contraceptive practices are affected by AIDS educational interventions (see appendix B).

Women who exchange sex for money or drugs are at risk of HIV infection through IV drug use and through their multiple and potentially high-risk sex partners. If infected, these women may transmit HIV infection to their babies and to male clients. CDC is collaborating with others in an ongoing,

cross-sectional study of women who have engaged in prostitution in several geographic areas (182).³⁶ Prostitutes have been recruited for participation in the study of HIV seroprevalence and AIDS risk factors through STD clinics, prisons, or outreach efforts, such as newspaper advertising and street contacts. Results of the study show that the major risk factor for HIV infection in prostitutes is IV-drug use, and not exposure to infected partners. Only 13 percent of women tested have returned to learn their test results. The return rate is better in San Francisco where outreach workers visit neighborhoods where the women are working than in other sites where study participants must travel to medical facilities to receive their test results (182). This suggests that education efforts targeted to prostitutes may be more effective when delivered by community role models and peers. Most prostitutes report some use of condoms by their customers, but efforts at maintaining safer sex practices may be hampered by customers' offering higher fees for unsafe sex practices. Customer education may therefore be key to improving compliance with safer sex recommendations (6). Barrier contraception, however, is generally not used with steady sexual partners who may be HIV infected (157).

Conclusions

No formal evaluations of AIDS educational programs implemented within clinics serving high-risk heterosexuals are available. Results of evaluations of STD clinic educational interventions, however, suggest that special educational interventions can improve knowledge and can affect attitudes toward preventive behavior. Here, the person-to-person interview appears to be relatively more effective than other methods, such as use of videotapes and special educational materials.

³⁵ "Routine counseling and testing" is defined as a policy to provide these services to all clients after informing them that testing will be done. Except where testing is required by law, individuals have the right to decline to be tested without being denied health care or other services.

³⁶ The areas are Atlanta, Colorado Springs, Las Vegas, Los Angeles, San Francisco, Miami, and the tri-city area including Newark, Jersey City, and Patterson (182).

Results have not been encouraging from studies that have attempted to measure actual changes in risk behavior attributable to an educational program. For example, neither distribution of free condoms nor special counseling were effective in reducing STD reinfection (46, 171). Provider performance, however, may have influenced patient compliance with a recommendation to return to the clinic (118). Given that the provider-client interview appears to be a preferred medium of communicating STD information and that the performance of the counselor affects client compliance, resources may be effectively used to ensure the quality of providers of AIDS and STD services (e.g., comprehensive training, continued education opportunities, interventions aimed at reducing provider stress, and burnout).

There are limited data on the size and characteristics of the high-risk heterosexual population. Certain groups, however, are recognized as being at high risk, and within these groups, innovative approaches are required to facilitate behavioral change. For example, interventions to “empower” women that may be involved in dependent relationships (e. g., partners of IV drug users; prostitutes) to encourage their partners to use condoms without, at the same time, jeopardizing themselves are being evaluated (see appendix B).

CERTAIN PRACTICES OF SCHOOL-AGE YOUTH

Introduction

Very few teenagers have AIDS.³⁷ As about one-fifth of all people with AIDS are in their twenties, however, many are likely to have contracted HIV while teenagers. Preventing the 29 million U.S. teenagers from

entering AIDS risk groups may be the most effective method of AIDS primary prevention because much of what teenagers learn and do as adolescents will affect their sexual and other risk-taking behaviors in later years. Evidence suggests that this will be a major challenge as many teenagers are now engaging in behaviors involving both sex and drugs that can transmit HIV.

School-Age Youth AIDS-Related Risk Behaviors

Risky sexual behavior is widespread among teens. According to national survey data, 78 percent of males and 63 percent of females have sex while teenagers (93). Although most teenagers do not have sex until they are age 16 or 17, in some communities the average age of first intercourse is 12 (33). For a substantial number of teens, sexual activity is not infrequent; among teens 15 years of age and older, at least one-third report having sex once a week or more (93). Of those that are sexually active, over 50 percent report having two or more partners (223) and less than half say they used any method of birth control at first intercourse (152). These behaviors have resulted in alarming rates of sexually transmitted diseases (STDs) among teens; teenagers acquire more than one-fourth of the estimated annual 20 million STD cases (222).

Teens at very high risk include the estimated 125,000 to 200,000 who become involved in prostitution each year (120) and those using intravenous drugs. One national survey indicates that 1 percent of United States high school seniors have used heroin (9). Of special concern are those living in communities where HIV is already prevalent, where there is more IV drug use, and where sexual intercourse is initiated earlier, is more frequent, is not protected by condoms, and is experienced with more partners.

³⁷ As of May 2, 1988, 257 out of a total of 60,852 AIDS cases reported to CDC occurred among those age 13 to 19 (192).

The Effectiveness of Specific Educational Interventions

In response to the threat AIDS poses to young people, by March 1988, 18 states had passed legislation requiring AIDS education in schools. Information about AIDS is being disseminated in schools; 51 percent of parents report that their 10-17 year-old children have already had some AIDS instruction (53). Because AIDS education is relatively new and curricula are still being developed, however, little specific information is available regarding what is actually being taught, at what grade level, within what classes, and to how many students. Furthermore, there is virtually no information regarding how effective school-based AIDS educational programs are in changing student risk behaviors. The CDC's Center for Health Promotion and Education, Office of School Health and Special Projects has funded 15 national organizations, 15 State education agencies, and 12 local education agencies to examine AIDS education within the public schools. Changes in knowledge and attitudes, and in some cases, reported behavioral intentions and behaviors, will be monitored through the use of pre- and post-intervention surveys (see appendix B).

Until data from AIDS education evaluations are available, it is worthwhile to examine the effectiveness of sexuality education programs that often include many of the same goals as AIDS education programs; to delay sexual intercourse, to reduce the number of sexual partners, and to increase the use of methods of birth control, such as condoms. Moreover, many of the decisionmaking and communication skills that sexuality educators teach are the same skills that some AIDS educators believe should be taught to reduce the transmission of the HIV virus.

This section reviews what is known regarding: 1) current levels of adolescent AIDS-related knowledge, attitudes, and beliefs; 2) the effectiveness of AIDS interventions aimed at improving knowledge and changing attitudes; and 3) the success of

sexuality education in changing sexual behaviors.

AIDS Knowledge, Attitudes, and Beliefs

Several studies have demonstrated that adolescents are quite knowledgeable about AIDS, particularly about the fact that vaginal and anal intercourse with an infected partner can transmit HIV. For example, a 1986 random telephone survey of 963 adolescents 16 to 19 years old in Massachusetts revealed that 98 percent knew that anal intercourse could transmit HIV and 92 percent knew that vaginal intercourse could transmit the virus (168). Some school-based surveys, however, suggest that there are important knowledge deficits. For example, in a 1986 survey of Connecticut secondary school students only half knew that people who shoot drugs (325/638) represented a high-risk group (89). A survey conducted one year earlier in San Francisco showed that while 92 percent (1213/1313) of the students correctly indicated that "sexual intercourse was one mode of contracting A I D S," only 60 percent (782/1303) were aware that "use of a condom during sexual intercourse may lower the risk of getting the disease" (62). Black and Hispanic adolescents were less knowledgeable about AIDS and were more likely to have misconceptions about transmission than white students (60). Most students reported wanting to learn more about AIDS, and many indicated that information about AIDS should be presented in public schools. Although more recent survey data are not available, researchers report that AIDS knowledge is likely to have improved (112).

Available data suggest that teenagers have initiated little behavioral change in response to AIDS. For example, the survey of Massachusetts adolescents conducted in 1986 revealed that of the 70 percent reporting sexual activity, only 15 percent had changed their sexual behavior because of concern about contracting AIDS, and of these, only 20 percent had implemented effective changes. Many adolescents, including those in the highest-risk subgroups of sexually active or psychoactive drug users, did not know what

sexual and drug precautions are needed to prevent transmission of the virus (168). To ascertain changes in knowledge, attitudes, and use of condoms in response to the threat of AIDS, a survey was conducted among sexually active adolescents attending a university or a health maintenance organization in San Francisco in 1984/85 and again in 1985/86. Although the perception that condoms prevent STDs and the value and importance placed on avoiding STDs remained high, adolescents did not report increased use, or intentions to use condoms over the study period (107).

Effectiveness of AIDS Education in Changing Knowledge and Attitudes

Thus far, evaluations of AIDS education programs in schools have focused upon changes in knowledge and attitudes (see table 2-3 for a description of evaluations of AIDS educational interventions). Significant increases in knowledge have occurred as measured before and immediately following AIDS education programs. For example, in one study, the percentage of students knowing that using condoms during intercourse is one way to help prevent the spread of AIDS increased from 70 to 87 percent (61). In another study, AIDS-related knowledge increased markedly, and students' perceptions regarding personal risk of AIDS declined slightly following the AIDS program (136). In neither study was the impact of the educational intervention on changes in risk behaviors evaluated.

Whether educational programs will affect teens' AIDS risk behaviors is uncertain. Some evidence suggests that young people who have not been exposed to an educational program overestimate both the number of cases of AIDS and the chances of getting AIDS from a single unprotected act of heterosexual intercourse (80). A 1985 survey of black and Hispanic adolescents showed that more knowledge about AIDS was associated with a lower perceived risk of contracting AIDS (60). AIDS-educated youth are probably more aware that they will not contract AIDS from casual contact with others.

Effectiveness of Sexuality Education

Lessons relevant to AIDS education can be learned from the literature regarding the effectiveness of sexuality education programs designed to reduce teen pregnancy and STDs other than AIDS, and to improve teens' sexual self-awareness and communication skills. Evidence from numerous studies indicate that sexuality education increases factual knowledge about sexuality and sexually transmitted disease but has little measurable impact upon attitudes (112). Few studies have adequately measured communication and other skills thought to be necessary to implement behavioral change, and the results of these are mixed.

One intervention, a 14-part, intensive cognitive-behavioral training course, used role playing and rehearsal to improve communication skills and attitudes compatible with lowering risk of pregnancy. At six-month followup, the 18 participants reported practicing more effective contraceptive methods and exhibited better communication skills than the control group. The evaluation of the intervention relied upon excellent measurement techniques, but its findings are limited because few students were involved in the program (160). Another study of several comprehensive sexuality courses found no impact on skills even though considerable time was devoted to teaching and practicing those skills in the courses. This study included a larger number of students but employed less valid methods of measurement than the smaller study reported above (113). The results of an intervention aimed at postponing sexual involvement among adolescents should be available in the near future (112). Investigators are evaluating an educational series designed to help adolescents resist social and peer pressures that can lead to early sexual involvement. A companion program for parents helps adults better understand the pressures experienced by adolescents and assists parents in reinforcing the information given to their children in school (96).

Sexuality education programs do not appear to have had an impact upon sexual in-

tercourse, either initiation or subsequent frequency. Although one major national study did find that among 15 and 16 year old females, those who had previously taken a sexuality education course were somewhat more likely than those who had not to initiate sexual activity at ages 15 and 16 (127), other national surveys have not found such a relationship (224). Preliminary findings from an evaluation of at least one community-based program specifically designed to reduce teen pregnancy suggest that the program may have succeeded in that effort (205). Here, an educational campaign intended to curb high teen pregnancy rates included the involvement of parents, churches, schools, the media, and other community organizations. Pregnancy rates dropped by more than half in the rural South Carolina county where the intervention was implemented. Whether the drop can be attributed to the program is, however, uncertain. Pregnancy rates in small populations may fluctuate from year to year. Furthermore, the unique program setting limits the generalizability of results.

In general, studies suggest that sexuality education may have a modest impact upon use of birth control during the first episode of sexual intercourse, and upon ever using it, but not upon current use. In one study of high school students, students who were more knowledgeable about the probability of becoming pregnant did not report unprotected intercourse less frequently than those students who were less knowledgeable. Similarly, students who were more knowledgeable about birth control were not more likely to use it (142). None of three major studies that evaluated the effect of educational interventions upon the incidence of pregnancy found a measurable impact (127,224,49).

The results of evaluations of sexuality education are consistent with studies of other kinds of educational programs designed to improve healthy adolescent behaviors. For example, driver education increases knowledge, but does not measurably reduce automobile accidents among teenagers. Other programs targeted to adolescents, however, have been successful. For example, some

anti-smoking programs for young adolescents have helped them delay or refrain from smoking, and a few drug education programs, particularly those that focused upon skills, have had some success (20,73).

There are a number of reasons why increases in knowledge from sexuality educational programs have limited impact upon behavior. First and foremost, there are many important factors other than knowledge that affect teenage sexual and contraceptive behavior. Over many years, teenagers are socialized by parents and peers and exposed to television and other media of popular culture. Their behavior is affected by a myriad of internal factors, such as physical development and sexual desires, emotional needs for affection and physical contact, ego strength, plans for the future, perceived ability to control one's own future, and attitudes toward parents and society. Other factors such as the availability of birth control may affect behavior. It is not surprising therefore, that a small amount of school-supplied information about sexuality has limited impact, especially since many programs produce only modest increases in knowledge and that knowledge may diminish with time.

Although most students know even before they take a sexuality education class that sexual intercourse can lead to pregnancy and that pregnancy can be avoided by using birth control methods, many young people do not apply their knowledge to their own behavior. As evidence that teenagers do not apply information to their personal situations, one investigator found that sexually active adolescents who could correctly answer questions about the timing of ovulation and pregnancy were not more likely to assess accurately their own probability of becoming pregnant. In fact, those that did not know whether or not they would get pregnant were more likely to use birth control (142). These findings suggest that those that are unaware of their actual risk may overestimate their risk and therefore be motivated to use birth control.

Another factor contributing to failure to use effective contraception is that sex among

sexually active young people may occur infrequently and is often unplanned. Teenagers who have sex infrequently may not have yet fully accepted the fact that they are sexually active and therefore may be inhibited about seeking information on contraception (112).

Conclusions

Whether the findings from research on sexuality education can be used to guide AIDS educational interventions depends in part upon teenagers' perceptions of the burden and risk posed by AIDS. Teens may be more highly motivated to adopt preventive behaviors to prevent a life-threatening disease than to prevent pregnancy or a treatable sexually transmitted disease. If teenagers do not believe that they are personally at risk of getting AIDS, however, then they may not respond to educational efforts.

In reality, for most teenagers, the probability of having sex with someone infected with HIV is quite small, and the probability of actually contracting HIV from that person is still smaller. Because teenagers, like adults, have difficulty making decisions when probabilities are small, they may be unlikely to change their behavior when provided accurate information. Educational programs may be more effective in high-risk communities where a higher percentage of people have AIDS. In such communities, the actual risk of contracting AIDS is higher and thus represents a more serious threat to teenagers. Moreover, the teenagers are more likely to know personally someone who is HIV-infected or has AIDS and thus apply the risk and costs of contracting AIDS to their own situations. To help make the risk of AIDS more personal, information about AIDS can be presented within the context of other, more prevalent STDs, such as gonorrhea and herpes simplex, with which adolescents may have greater familiarity (61).

To be effective at reducing risk-taking behavior, AIDS education programs must do much more than simply increase knowledge. Programs that use role playing extensively to

improve decision making and communication skills and possibly reinforce particular norms may be effective (160). In the case of AIDS, role playing may involve students' practicing how to say "no" to sex, how to refrain from having sex when condoms are not available, how to discuss the threat of AIDS without offending their sex partners, and how to insist upon the use of condoms when having sex.

AIDS educational efforts could be integrated into much more comprehensive community-wide programs that reinforce it. In addition to involving schools, such programs can include parents, radio and television stations, newspapers, churches, youth-serving agencies, family planning agencies, and other community groups or organizations. School programs are much more likely to be effective if the norms expressed in those programs are supported and reinforced by the larger social environment. At least one study indicates that such programs do affect behavior (205). When AIDS educational programs are implemented in the schools, teachers need to be trained to communicate sensitive information. Teachers who are uncomfortable discussing sexuality and specific sexual and drug-related behaviors are not likely to be effective in facilitating frank, open discussions (62).

There is evidence from other health areas, such as smoking, indicating that when programs are implemented earlier, they may be more effective. AIDS educational programs could be implemented in elementary and middle schools, as well as in high school. As gains in knowledge and attitudes acquired through educational programs appear to decline with time, there is a need to reinforce AIDS prevention messages. As adolescents advance through the school system, new, age-appropriate messages could be introduced.

Programs may be more effective if adolescents, themselves, play a major role in the educational program and accept some responsibility for the effectiveness of the programs (41). When many student leaders openly and consistently express norms against

risk-taking behavior, school-wide norms may change. Another reason to implement AIDS education programs early is that those students who are most likely to live in high-risk areas and to engage in risk-taking behaviors are also more likely to drop out of school. Nationally, about 25 percent of young people drop out of school before high school graduation (112), and the percentages are much higher in communities where AIDS is likely to be more prevalent.

In addition to school drop-outs, other high-risk adolescents may not be reached through school-based AIDS educational interventions. Teen runaways, teens engaged in prostitution, and youths in juvenile detentions programs will need to be reached through community-wide strategies. One suggested approach is to train and utilize indigenous community members and groups to serve as AIDS educational resources and as community outreach workers (62). The CDC is funding several projects to reach out-of-school youth through the National Programs for School Health Education to Prevent the Spread of AIDS (SHEPSA). For example, the National Coalition of Hispanic Health and Human

Services Organizations will provide agencies serving out-of-school Hispanic youth with educational materials (see appendix B).

Shelters for the homeless may be an important site for AIDS educational activities as many of them serve the estimated 1 to 1.25 million minors that annually run away from home. Characteristics of runaway and homeless youth vary in different locals but many appear to be at high risk for AIDS. One New York City-based study found 85 percent to be sexually active, 10 percent engaged in prostitution, and 5 percent using IV drugs. Anecdotal data from Los Angeles suggest that as many as 35 percent of runaway youth there have been thrown out of their homes because of homosexuality (200). AIDS information for street youth and incarcerated juveniles must be simple, explicit, and direct. As many of these youth are learning disabled or have other problems with reading, verbal educational approaches are preferable (153). The National Institute of Mental Health is funding evaluations of AIDS prevention activities implemented for adolescents who seek services at runaway shelters or at agencies serving homosexual youth (see appendix B).

Table 2-1.--Effectiveness of Educational Interventions Targeted to IV Drug Users

Author	Educational goal	Intervention(s)/ Outcome measure(s)	Study design	Year(s) data collected	Results/ Comments
Chaisson, Osmond, et al., 1987	Encourage safer injection practices among IVDUs.	Interventions: Bleach distribution, AIDS education provided by outreach workers. Outcome measure: Reported use of bleach.	Pre-post intervention cross sectional surveys.	Study population: Bleach distributed to San Francisco IVDUs not in treatment. Surveys conducted among IVDUs in treatment. Sample size: 1985 survey included 152 IVDUs in treatment. In 1987, 172 were surveyed. Years data collected: Bleach distribution in 1986, surveys conducted in 1985 and 1987.	Results: Reported bleach use (usually or always) rose from 6% pre-intervention to 47% post-intervention. Comment: The prevalence of HIV antibody positivity among addicts in treatment rose from 10% in 1985 to 15% in 1987.
Jackson and Rotkiewicz, 1987	1. Promote enrollment in drug treatment. 2. Encourage drug users not to share injection equipment. 3. Teach methods of sterilizing injection equipment.	Interventions: Ex-addict AIDS outreach workers provided face-to-face education and distributed "vouchers" redeemable for a free treatment episode in a detoxification program. Outcome measure: Enrollment in treatment.	Descript ve.	Study population: New Jersey IVDUs who had not sought treatment for at least one year received vouchers. Sample size: Characteristics of those redeeming the first 1,000 vouchers distributed are described. Year data collected: 1986	Results: Over 80% of the first 1,000 vouchers were redeemed. Young black males, previously under-represented in the State treatment system, were overrepresented among those redeeming the vouchers. 40% of redeemers had not previously been in treatment. 28% of redeemers went on to longer-term treatment.
McAuliffe, et al., 1987	Improve AIDS knowledge and reduce unsafe drug injection and sexual practices.	Interventions: Ex-addict outreach workers distributed information about AIDS. They did not distribute bleach for use in sterilization. Outcome measure: Changes in knowledge and practices ascertained at interview.	Quasi experimental. Educators were assigned to work in half of randomly selected city areas. Pre-interview scores were compared to those obtained one month after the intervention.	Study population: Baltimore IVDUs. Sample size: 236 individuals in intervention areas; 72 in control areas. Year data collected: 1986	Results: Individuals in intervention areas showed significant changes in knowledge and showed greater but, statistically insignificant, increases in risk reduction. Comment: The intervention may not have been successful in changing behavior because it did not provide any easy and convenient methods for sterilization and did not provide access to treatment programs.

Table 2- Effectiveness of Educational Interventions Targeted to IV Drug Users--Page 2

Author	Educational goal	Intervention(s)/ Outcome measure(s)	Study design	Study population/ Sample Size/ Year(s) data collected	Results/ Comments
Van den Hoek, et al., 1987	Promote safe injection practices.	Intervention: A needle exchange program was established prior to 1985 to reduce the spread of hepatitis among IVDUs. Outcome measure: Needle exchange program utilization.	Pre-post intervention cross sectional surveys.	Study population: IVDUs in Amsterdam. Sample size: Total population of IVDUs. Years data collected: 1985-86	Results: Prior to the AIDS epidemic less than 10% used the needle-exchange program. Following the AIDS epidemic, utilization rose to almost 50%. Comment: The needle exchange program was not effective in reducing the spread of hepatitis B among IVDUs probably because IVDUs did not consider hepatitis B to be a sufficient threat to use sterile equipment sufficiently frequently.
Watters, 1987	Improve AIDS knowledge and improve injection equipment sterilization practices.	Interventions: AIDS information provided and small bottles of bleach distributed by outreach workers. Outcome measure: Reported use of bleach.	Pre-post intervention cross sectional surveys.	Study population: San Francisco IVDUs not in treatment. Sample size: 438 IVDUs were interviewed in first survey (Winter/Spring, 1986); 500 in second survey (Winter/ Spring, 1987). Years data collected: 1986, 1987	Results: 3% of IVDUs reported using bleach before the program as compared to 67% after the program had been in effect for about 6 months. Comment: Reductions in reported needle sharing, increased use of condoms, and increased AIDS knowledge occurred.

Abbreviations: KLI = randomized controlled trial; IVDUs = IV drug users

SOURCE: Office of Technology Assessment, 1988, based on a contractor document by Don C. Des Jarlais, "The Effectiveness of AIDS Educational Programs for Intravenous Drug Users," prepared for the Office of Technology Assessment, March 1988.

Table 2.2.--Effectiveness of Educational Interventions Targeted to Attendees of Sexually Transmitted Disease Clinics¹

Author	Educational goal	Intervention(s)/ Outcome measure(s)	Study design	Study population: Sample size/ Year(s) data collected	Results/ Comments
Alkhatieb, et al., 1975	Improve patients' knowledge related to STDs.	<p>Interventions:</p> <ol style="list-style-type: none"> 1. Programmed learning guide. 2. Audiovisual technique. 3. Person-to-person interview. <p>Outcome measures: STD knowledge as measured on pretest and posttest questionnaires.</p>	Modified Solomon design (allows isolation of the effect of the intervention from effects of the evaluation process (e.g., learning from taking a pretest).	<p>Study population: STD clinic attendees.</p> <p>Sample size: 443 participants allocated to 9 groups.</p> <p>Years data collected: Unknown</p>	<p>Results: The three interventions accounted for a 20% increase on posttest knowledge scores. The interview technique was the most effective.</p> <p>Comment: Educational interventions were well accepted by the clinic attendees; 80% of participants judged the time spent using the educational techniques to be "just right."</p>
Darrow, 1987	Assess STD clinic attendees' acceptance and effective use of free condoms.	<p>Interventions: Coupons for free condoms were given to participants.</p> <p>Outcome measures: Proportion redeeming condom coupons. Reduction in gonorrhea reinfections</p>	Cross sectional study of condom acceptance. Prospective study of gonorrhea reinfections.	<p>Study population: Consecutively admitted patients to the Sacramento STD clinic over a 3 month period completing a self-administered questionnaire.</p> <p>Sample size: 2,045 of 2,358 clinic attendees completed the questionnaire.</p> <p>Year data collected: 1971</p>	<p>Results: 27% of participants received condoms. 35% of males accepted the offer, but only 19% of females did. Prior condom use and history of STD were related to acceptance. Acceptors and non acceptors of condoms had the same rates of reinfection with STDs.</p>
Education Development Center, Inc., 1986	<p>Phase I: 1. Increase the number of male gonorrhea patients to return to STD clinic for followup.</p> <p>2. Motivate male patients to refer sex partners for treatment.</p>	<p>Interventions: Phase I: "soap-opera" type videotapes featuring black actors using a non-authoritative approach. Emphasis on changing attitudes and modeling communication and interpersonal skills.</p> <p>Outcome measures: Phase I: 1. Rates of return for followup within 14 days.</p> <p>2. Proportion of sex partners treated at the STD clinic.</p>	Randomized clinical trial conducted in three phases.	<p>Study population: Inner-city (Baltimore, Washington D.C., and Boston), primarily black STD clinic attendees ages 18-35.</p> <p>Sample size: Phase I: 456 in experimental group, 446 in control group.</p> <p>Years data collected: 1983-86</p>	<p>Results: Phase I: Rates of return for experimental group 53.5%, for control group 43.3%.</p> <p>Comment: Phase I: The pre-study return rate was 42.9%.</p>

Table 2-2.--Effectiveness of Educational Interventions Targeted to Attendees of Sexually Transmitted Disease Clinics¹--Page 2

Author	Educational goal	Intervention(s)/ Outcome measure(s)	Study design	Study population, Sample Size/ear(s) data collected	Results/ Comments
Educational Development Center, 1986 (cont.)	Phase II: Increase compliance with prescribed oral medication.	Interventions: Phase II: Videotape, and/or special pill packaging. Outcome measures: Phase II: Medication compliance as reported by telephone interview on the 2nd or 6th days after treatment.	RCT.	Study population: Phase II: Black, single, males, average age 23, most diagnosed with non-gonococcal urethritis. Sample size: Phase II: 372 treated patients were randomly assigned to intervention groups. Years data collected: 1983-86	Results: Phase II: Participants who viewed the videotape or received special medication packaging scored significantly higher on the 15-item medication compliance test than controls. Comment: Phase II: With the combination of videotape and special medicine packaging, 70% of patients took medication as prescribed. Those receiving one or another of the interventions were more likely to have refrained from sex until the followup interview.
Educational Development Center, 1986, Inc., (cont.)	Phase III: 1. Encourage men to use condoms. 2. Encourage women to be assertive in requesting that their partners use condoms.	Interventions: Phase III: 1. Videotape, followed by an in-depth discussion including review of a checklist of items discussed. 2. Free condom distribution via a redeemable coupon vs. mail-in coupons. Outcome measures: Phase III: Knowledge and attitudes as measured by assessment questionnaires administered after the discussion.	RCT.	Study population: Phase III: English-speaking STD clinic attendees age 18 and older. Sample size: Phase III: 1. Videotape/ discussion intervention. 51 in experimental group, 52 in control group. 2. Condom distribution. 89 in experimental group, 93 in control group. Years data collected: 1983-86	Results: Phase III: 1. 71% of experimental group demonstrated attitudes compatible with prevention compared with 33% of control group. 2. Patients watching the video were more likely to redeem coupons for free condoms than controls.

Table 2-2.--Effectiveness of Educational Interventions Targeted to Attendees of Sexually Transmitted Disease Clinics¹--Page 3

Author	Educational goal	Intervention(s)/ Outcome measure(s)	Study design	Study population/ Sample Size/ Year(s) data collected	Results/ Comments
Proctor, 1988	Improve rate of return for followup among treated STD attendees.	<p>Interventions:</p> <ol style="list-style-type: none"> Use of patient-clinician contracts outlining positive patient behaviors. New educational materials for waiting room and patient instruction sheets (cartoon-type). <p>Outcome measures: Return rates for "test of cure" among both men and women.</p>	Pre/post evaluation and natural experiment. A separate STD patient population seen in the same clinic by other health providers served as a control group to the intervention group. Control group members were participating in drug studies and reimbursed for followup.	<p>Study population: The STD clinic population was 95% black and 65% male.</p> <p>Sample size: 715 men and 290 women.</p> <p>Years data collected: Unknown</p>	<p>Results: Rates of return improved for women (pre-study 35% vs. post-study 73%) but not for men (pre-study 33% vs. post-study 37%). The control population return for followup rate was 38%.</p> <p>Comment: During the study period rates of return were very high for both men (67%) and women (97%). Increases are attributed to the Hawthorne effect (impact of study observers). This suggests improvements in provider performance impacts patients' compliance.</p>
Potterat and Rothenberg, 1977	Evaluate an alternative to the standard case interview and investigation process.	<p>Interventions: Control group received standard contact interview (20 minutes) and were told to refer sexual contacts (Patients were told that partners not seen in clinic within 7 days would be followed up by the clinic). Experimental group received a 3-5 minute counseling session and were given referral cards for partner referral.</p> <p>Outcome measures: Sex partners per index cases coming to STD clinic for evaluation.</p>	Alternate patients assigned to experimental and control groups.	<p>Study population: Heterosexual male gonorrhea patients seen in a STD clinic.</p> <p>Sample size: 93 in experimental group, 94 in control group.</p> <p>Year data collected: 1975</p>	<p>Results: Control group referred 58% of contacts compared with 80% in experimental group.</p> <p>Comment: The experimental intervention was more cost effective than standard care in terms of sex partner referral.</p>

Table 2-2.--Effectiveness of Educational Interventions Targeted to Attendees of Sexually Transmitted Disease Clinics --Page 4

Author	Educational goal	Intervention(s)/ Outcome measure(s)	Study design	Study population/ Sample Size/ Year(s) data collected	Results/ cComments
Tucker, 1977	Reduce gonorrheal reinfection among STD clinic attendees.	Interventions: Counseling patients to avoid sex with untreated sex partners, and to use condoms to avoid reinfection. Outcome measures: Sexual activity as reported in an interview.	RCT.	Study population: STD clinic patients with first infection who were at least age 16. Those returning to the clinic with a reinfection within 4 months were interviewed and randomly assigned to an intervention or control group. Those not returning within 4 months were contacted for followup. 78% of participants were black. Of 500 male participants, 73 (14.6 percent) returned to clinic reinfected within 4 months. Among those not returning but followed up, 30% were reinfected. 18X of study participants were lost to followup. Years data collected: 1975-77	Results: Men in the experimental group experienced the same rate of reinfection as those in the control group (21X). comment: Sociodemographic characteristics associated with recidivism include age and race.
US DHHS, CDC, Div. STD, 1978	1. Encourage gonorrhea patients to notify the r sexual contact of the need for examination. 2. Improve clinic return rates.	Interventions: Three interventions were studied: 1. Pamphlet, counseling, dispensing of partner referral cards; 2. Counseling plus request for names of sexual contacts for clinic followup; 3. Minimal control interview plus dispensing of partner referral cards. Outcome measures: Number of gonorrhea positive cases per index case.	RCT.	Study Population: Male and female gonorrhea patients seen in a STD clinic c in Miami, Florida. Sample size: 1,898 gonorrhea patients. 94X male. Years data collected: Unknown	Results: Groups 1 and 3 (use of partner referral cards) each yielded 0.36 gonorrhea positive sexual contacts per index case. Group 2 yielded 0.6 per index case. comment: Although clinic followup yielded more diagnosed partners per index case, the costs were 3-4 times the cost of patient-initiated followup up.

Abbreviations: RCT = randomized controlled trial; STD = sexually transmitted disease

IEducational interventions pertain to STDS other than AIDS-

SoURCE: Office of Technology Assessment, 1988, based on a contractor document by Stephen MargoLis, IThe Effectiveness of Educational and Related Efforts among Attendees of Public CLinics for Sexually Transmitted Diseases," prepared for the Office of Technology Assessment, Washington, DC, March 1988

Table 2-3. --Effect of AIDS of Sexuality Educational Interventions to Adolescents

Author	Educational goal	Interventions)/ Outcome measure(s)	Study* design	Study population/ Sample Size/ Year(s) data collected	Results/ Comments
Dawson, 1986	Study assessed the impact of sex/contraceptive education on initiation of sexual activity, use of birth control, and pregnancy.	Intervention: NA Outcome measure: Reported initiation of sexual activity, use of birth control and pregnancy at interview.	Cross-sectional survey. Multivariate logit analysis used to study the relationship between sexuality education and Outcomes of interest while controlling for sociodemographic characteristics.	Study population: Women aged 15 to 19. Sample size: 1,888 women were surveyed. Year data collected: Study is based the 1982 National Survey of Family Growth.	Results: Sexuality education may be related to initiation of sex for 14 year olds, but not for older teens. <i>Sexuality</i> education was positively related to use of birth control during first coitus and with ever having used birth control but was not related to current use. Sexuality education was not significantly related to pregnancy. Comment: For cases in which sexuality education and initiation of sex occurred in the same year, the temporal order of events could not be determined. The analysis controlled for region, race, income, parents' education, number of parents lived with at age 14, religious practices, and urbanicity.
DiClement et al., 1987	Increase student's knowledge of AIDS/STD transmission and prevention.	Intervention: 3-hour AIDS program. Outcome measure: Performance on knowledge test.	Pretest-posttest design. Comparison of changes in knowledge of xposed vs. control group.	Study population: Students attending San Francisco middle and high schools. Sample size: 366 students in intervention group; 273 in control group. Year data collected: 1986	Results: Intervention group should statistically significant improvement in knowledge scores (scores increased from 31.4 to 36.0 out of a total of 46) as compared to no significant change for the control group. The proportion of students knowing that using condoms helps prevent AIDS increased from 70% to 87%. Comment: The posttest was administered immediately after the intervention. Program was successful in dispelling misconceptions about casual contact.

Table 2-3.--Effectiveness of AIDS and Sexuality Educational Interventions Targeted to Adolescents--Page 2

Author	Educational goal	Intervention(s)/ Outcome measure(s)	study design	Year(s) data collected	Results/ Comments
Furstenberg, et al., 1985	Analysis of impact of sexuality education on initiation of sex.	Intervention: NA. Outcome measure: Onset of sexual intercourse as reported on survey.	Cross sectional survey.	Study population: 15 and 16 year olds sampled in the 1981 National Survey of Children. Sample size: 500	Results: Adolescents who had received sexuality education were less likely to have initiated sexual intercourse. Comment: Analyses controlled for age, race, and other background variables.
Kirby, 1984	14 exemplary sexuality education programs were evaluated. Programs varied in goals and methods.	Intervention: Educational approaches varied; some were non-secular based, some included parents. Outcome measure: Sexual and contraceptive behavior as reported on questionnaires.	Pretest-posttest design. For some programs evaluated, there was a comparison group of students not exposed to the educational intervention.	Study population: Programs located throughout the country and targeted to elementary, junior high or high school students. Sample size: Data from more than 2,000 students completing the pre and post questionnaires were analyzed. Years data collected: early 1980s	Results: None of the sexuality courses had a measurable impact upon the incidence of sexual intercourse. For 11 of the 14 courses, for which impact on contraceptive use could be measured, none had any measurable impact upon contraceptive use. Comment: Only exemplary programs were evaluated. Students could not be randomly assigned to intervention and control groups. The sample sizes for each type of program were rarely more than a few hundred and thus could not detect small effects. The long-term effects of the programs were not measured.

Table 2-3.--Effectiveness of AIDS and Sexuality Educational Interventions Targeted to Adolescents--Page 3

Author	Educational goal	Intervention(s)/ Outcome measure(s)	Study design	Year(s) data collected	Sample Size/ Population	Results/ Comments
Marsiglio and Mott, 1986	This study examined the impact of a cross-section of American sexuality education programs.	<p>Intervention: MA.</p> <p>Outcome measure: Responses to personal interviews regarding sexual, contraceptive, and fertility experience.</p>	<p>Longitudinal survey of 14 to 22 year olds first conducted in 1979. The same respondents were reinterviewed each year thereafter.</p> <p>Multivariate logit analysis was used to analyze responses of those reinterviewed in 1984.</p>	<p>Study population: Nationally representative sample of men and women aged 14 to 22 in 1979.</p> <p>Sample size: Analysis is based upon the 6,015 women and 6,054 men reinterviewed in 1984.</p> <p>Year data collected: Based on the 1984 National Longitudinal Survey of Work Experience of Youth.</p>	<p>Results: 14 to 15 year old women having had a sexuality education course were significantly more likely to have initiated sex activity during the following year. This was not true for older females. Sexuality education that included birth control information was not significantly related to recent use of birth control. Sexuality education in general, however, was significantly related to recent use of birth control. There was no significant relationship between having had sexuality education and subsequent pregnancy.</p>	
Miller and Downer, 1987	Improve AIDS knowledge and attitudes.	<p>Intervention: 50-minute multi-media, AIDS program.</p> <p>Outcome measure: Performance on knowledge and attitude survey.</p>	<p>Pretest-posttest design, no comparison group.</p>	<p>Study population: Seattle high school students.</p> <p>Sample size: 114 students completed pretest 1 month prior to and 1 week after educational program. 53 of these completed a delayed posttest 8 weeks after the program.</p> <p>Years data collected: 1986-87</p>	<p>Comment: Many programs were short and limited. The study provides no indication of the effectiveness of more comprehensive programs.</p> <p>Results: Knowledge test scores increased from 78% to 90%. The % of students who thought they might get AIDS did not decrease significantly. An 8-week post test showed retention of knowledge.</p> <p>Comment: Students completing the pre and post test were not representative of school population (black students underrepresented).</p>	

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Author	Educational goal	Intervention(s)/ Outcome measure(s)	Study design	Year(s) data collected	Results/ Comments
Schinke, et al., 1981	Help adolescents avoid unplanned pregnancy by improving communication skills and increasing sense of responsibility for birth control.	<p>Intervention: Intensive cognitive-behavioral training. The 14-part course taught contraceptive information, communication and problem-solving skills through role playing and rehearsal.</p> <p>Outcome measure: Structured interviews were used to measure knowledge and attitudes. Responses to stressful vignettes were video-taped to measure skills.</p>	Students were assigned randomly to one condition of a Solomon four-group design: pretest, training, and posttest; training and posttest; pretest and posttest; and posttest only.	<p>Study population: Public high school sophomores.</p> <p>Sample size: 18 participants were compared to 18 controls.</p> <p>Years data collected: 1979-80</p>	<p>Results: Participants had higher levels of sexual knowledge and better interpersonal problem-solving and communication skills as demonstrated in video performance. Participants were more willing to refuse to risk getting pregnant and more willing to share responsibility for birth control.</p> <p>Comment: At 6-month followup participants had better attitudes toward family planning and were practicing more effective contraceptive methods than controls.</p>
Vincent, et al., 1987	Reduce occurrence of unintended pregnancies among unmarried adolescents. Increase knowledge; align personal values with those of the family, church, and community; improve self esteem; improve decisionmaking and communication skills.	<p>Intervention: Implementation of a comprehensive, community-wide program that involved parents, churches, schools, the media, and other community organizations.</p> <p>Outcome measure: Pregnancy rates for females 14-17 years old for two years before the program was implemented and three years after.</p>	Descriptive. Pre-post intervention design.	<p>Study population: Rural county in South Carolina.</p> <p>Sample size: Approximately 325 females 14 to 17 years old lived in the targeted area.</p> <p>Years data collected: 1981-85</p>	<p>Results: Pregnancy rates dropped by more than half.</p> <p>Comment: Pregnancy rates in small populations may fluctuate from year to year. Whether the drop can be attributed to the program is uncertain. If program was responsible for the drop, it is unclear what component of the intervention was successful.</p>

Table 2-3.--Effectiveness of AIDS and Sexuality Educational Interventions Targeted to Adolescents--Page 5

Author	Educational goal	Intervention(s)/ Outcome measure(s)	Study design	Study population/ Sample Size/ Year(s) data collected	Results/ Comments
Yarber, 1986	Increase knowledge about STD, and improve attitudes toward prevention.	Intervention: A new CDC curriculum emphasizing health behaviors instead of biomedical facts was compared to standard school STD unit and no instruction. Outcome measure: Changes in knowledge and attitude scores.	Quasi-experimental design involving experimental and suburban, 3 urban) in central and eastern States. Students were not randomly assigned.	Study population: Secondary students in six school districts (1 rural, 2 suburban, 3 urban) in central and eastern States. Sample size: 566 students received the CDC curriculum; 387 no instruction; and 161 the standard curriculum. Year data collected: 1985	Results: CDC curriculum improved STD knowledge, but knowledge gains declined at the delayed 6 week post-test. Beliefs and feelings about healthy behaviors improved significantly and remained improved until the delayed posttest. Intentions to engage in healthy behaviors improved, but not as much and after 6 weeks, were not significantly different from before the program.
Zelnik and Kim, 1982	Study of the relationship between sexuality education and initiation of sex, contraceptive practices, and pregnancy.	Intervention: NA. Outcome measure: Self-reported behaviors on interview.	Cross-sectional survey data are analyzed.	Study population: 1976 and 1979 survey data on a nationally representative sample of women aged 15-19 living in households in SMSAs. Years data collected: Analysis based on two national surveys of teenagers (1976 and 1979).	Results: No consistent relationship was found between sexuality education and initiation of sex. For most age-race groups of women, there was no relationship between sexuality education and use of birth control. For 6 race/age groups, there were statistically significant results indicating that young women exposed to sex education were more likely to have used birth control. Young women who had received sexuality education were less likely to have become pregnant. Comment: The temporal order of sexual activity and sexuality education could not be determined. The analysis controlled only for age, race, and sex.

Abbreviations: RCT = randomized controlled trial; NA = not applicable; SMSAs = standard metropolitan statistical areas

SOURCE: Office of Technology Assessment, 1988, based on a contractor document by Douglas Kirby, "The Effectiveness of Educational Programs to Help Prevent School-age Youth from Contracting AIDS: A Review of Relevant Research," prepared for the Office of Technology Assessment, Washington, DC, March 1988.