Current Approaches to Prevention of HIV Infections

WILLIAM L. ROPER, MD

Dr. Roper is Director of the Centers for Disease Control, Public Health Service, in Atlanta, GA.

Tearsheet requests to Office of Public Affairs, Mail Stop D25, Centers for Disease Control, Atlanta, GA 30333.

Synopsis

The HIV education and prevention strategy of the Centers for Disease Control has three principal components: (a) *public information and education,* (b) *education for school-aged populations, and* (c) *risk reduction education and individual counseling and testing services for people at increased risk of HIV infection.*

The most visible components of the public information and education programs are the National Public Information Campaign ("America Responds to AIDS"), the National AIDS Hotline system, and the National AIDS Information Clearinghouse. Components of the youth education program consist of funding for national health and education organizations, funding for State and local education departments, training, surveillance of education efforts, and evaluation. Counseling and testing has entailed performance of approximately 2,500,000 HIV antibody tests with pre- and post-test counseling, notification and counseling of sexual and needle-sharing partners of those infected with HIV, and targeted risk reduction education through community-based organizations.

Over time, these activities will continue to evolve and become more effective.

STOPPING THE ACQUIRED immunodeficiency syndrome (AIDS) epidemic has been described as "the nation's number 1 public health priority" (*1*). Since AIDS represents the end result of an infection typically acquired 7–10 years previously, a major component of the battle is to prevent initial infection with the human immunodeficiency virus (HIV). The Centers for Disease Control (CDC) is the Federal agency charged with coordinating that effort. This article will describe the elements of the current HIV prevention program.

Effective prevention programs must be guided by effective surveillance and epidemiologic studies of HIV infection and AIDS. Effective epidemiologic studies are needed to identify the modes of HIV transmission. Surveillance activities include identifying the number of persons who are infected with HIV, studies to determine the prevalence of HIV infection in different population groups, and assessments of knowledge, attitudes, and beliefs about behaviors related to HIV transmission.

In the absence of a vaccine, the best opportunity for altering the course of the HIV epidemic is the development of effective educational campaigns to change drug abuse and sexual behaviors that are risks for transmission. The three primary modes of HIV transmission are sexual contact (particularly between men), contact with blood, and between mother and fetus or infant (*2*). This epidemiologic information forms the basis for programs to reduce HIV transmission.

CDC's HIV education and prevention strategy has three principal components: (*a*) public information and education, (*b*) education for school-aged populations, and (*c*) risk reduction education and individual counseling and testing services for people at increased risk of HIV infection.

Public Information and Education

The most visible national public information and educational programs are CDC's National Public Information Campaign, the National AIDS Hotline system, and the National AIDS Information Clearinghouse.

The "America Responds to AIDS" public information campaign is designed to ascertain the public's level of knowledge, attitudes, and beliefs about HIV infection and to develop responsive educational messages. With direction and input

'This system of public service announcements, hotline, and clearinghouse fulfilled more than 60 million requests for print materials in 3 years.'

from numerous sources, the campaign develops creative educational materials for television, radio, and the print media. Before public release, these materials are tested on about 5,000 randomly selected adults across the country.

Since the beginning of the public information campaign in October 1987, 80 television, 61 radio, and 75 print ads have been produced and marketed to national, regional, and local public media service directors. Through September 1990, the campaign had received 52,454 airings worth $58,500,000 of donated time.

The public information campaign is closely tied to the National AIDS Hotline system which consists of an English language service, a Spanish language service, and TTY computerized telephone service for the deaf. The number of calls processed in its first 3 years has been 5 million.

The National AIDS Information Clearinghouse provides the reference base of AIDS resources and materials that are used by the hotline to provide callers with AIDS-related information and referrals. The clearinghouse also serves health professionals and other intermediaries with direct access to information and materials. The clearinghouse works in concert with the National Library of Medicine, the Food and Drug Administration, the National Institute of Allergy and Infectious Diseases, and other Public Health Service agencies to provide specialized information services. One of these services is the Clinical Trials Database, providing information on clinical trials and drug protocols to health professionals.

This system of public service announcements, hotline, and clearinghouse fulfilled more than 60 million requests for print materials in its first 3 years of existence. The public information and education program also attempts to involve business, religious, educational, and voluntary organizations in disseminating information to the public.

Prevention Programs for Youth

In 1987, the Centers for Disease Control began a national program to help schools and youth-serving agencies implement effective health education to prevent the spread of HIV. School-based prevention efforts have the potential to reach the more than 45 million young people currently enrolled in elementary and secondary schools across the country and the more than 12 million students enrolled in colleges and universities. In addition, the approximately 9 million young people ages 14 to 21 who do not attend school or college and are not reached by school-based prevention programs are the focus of targeted prevention efforts outside the school setting. Programs for all school-aged populations are able to benefit from the six major elements of the national program that work together to develop HIV prevention programs.

First, funding is provided to national health and education organizations, such as the National Organization of Black County Officials and the National Network of Runaway and Youth Services, to develop educational materials for State and local education agencies, agencies serving the educational needs and interests of out-of-school youth, college health services, and health care providers serving youth in correctional facilities.

Second, education departments in 55 States and Territories and in 16 cities with a high number of AIDS cases receive direct financial and technical assistance for activities ranging from teacher training to programs for out-of-school youth to monitoring risk behaviors of students.

The third element of the national program is designed to train State and local program managers and other decision makers, including parents, to develop and implement HIV prevention education programs. Fourthly, three education agencies receive funds to train teams of State and local education and health agency representatives to work together in managing their HIV prevention efforts. During the 1988–89 school year, teams from 21 cities and 28 States attended at least one training program. Most of the funded State and local departments of education also provide training for their teachers, helping them to use HIV education materials effectively. This training is aided by the CDC data base that lists information on more than 400 HIV-related curriculums, brochures, videos, and other prevention program information.

To determine the extent to which HIV education is available in schools, and to monitor changes in HIV-related risk behaviors among students, a number of survey activities are carried out. These activities make up the fifth surveillance element of the national prevention efforts. They include assessing the number and percentage of schools that

provide HIV education at each grade level, as well as the number and percentage of students that receive HIV education at each grade level, and monitoring HIV-related knowledge, beliefs, and behaviors among representative samples of high school students in State or local jurisdictions. The results of these surveys are used by programs nationwide to improve the effectiveness of school health education programs.

Finally, incorporating an evaluation element allows the States and cities to evaluate the impact of their programs, and it allows CDC to conduct research about the effectiveness of specific education interventions.

Persons at Increased Risk

The largest component of CDC's prevention program is directed to persons who are, or may be, at increased risk of HIV infection, either because of their own behaviors or the behaviors of those with whom they have intimate contact. This component includes both educational approaches and individual counseling and testing services.

Counseling and testing. The primary public health purposes of counseling and testing are to help uninfected people initiate and sustain behavioral changes that reduce or eliminate their risk of becoming infected, to assist in the early identification of infected persons, and to help them avoid transmitting infection to others. Recent information (*3*) that the progression of infection to symptomatic AIDS can be delayed by treatment of asymptomatic HIV-infected persons who have diminished numbers of circulating CD4 lymphocytes has added personal benefits to early knowledge of infection. Both pre-test and post-test counseling are integral parts of the process to ensure that people understand the implications of testing and of the results. Confidentiality is essential to acceptance of testing, and many sites offer anonymous testing for those who wish to protect their identity even further.

CDC began providing support to State and local health departments for counseling and testing soon after serologic tests were licensed in 1985. Initially, these were provided in separate "alternate" test sites, so described because they provided the only alternative to blood banks for persons seeking the test.

Increasingly, however, counseling and testing services are being provided at sites where high-risk persons are being seen for other reasons—sexually transmitted disease clinics, intravenous drug treatment programs, tuberculosis clinics, family planning clinics, and community health centers, for example. People found to be infected with HIV are referred for further clinical evaluation and followup.

Several States are evaluating the efficacy of case managers and followup counseling to reinforce safe behavior and to assist persons with HIV infection to notify partners or spouses and to obtain medical and community psychosocial support services.

By the end of 1989, more than 5,000 publicly funded sites were providing counseling and testing. Approximately one-quarter of these were freestanding ("alternate") sites; the remainder were associated with other services. These sites have cumulatively performed approximately 2.5 million HIV-antibody tests, of which nearly 150,000 (6.0 percent) were positive (*4*). An unknown number of tests have also been performed in the private sector. It should be kept in mind that these figures represent tests, not people. Based on data on retesting from some special surveys, we estimate that the tests reported represent at least 2 million people and that at least 120,000 different persons have learned at these public sector sites that they were infected.

The characteristics of those being tested are somewhat different from those who have developed AIDS, but they are reflective of developing patterns of transmission. Whereas homosexual-bisexual men and intravenous drug users account for more than 90 percent of AIDS cases reported to date, they account for less than 25 percent of those seeking testing. Nearly three-quarters of those seeking testing identify themselves as heterosexual, and the majority have some identified risk factor such as a sex partner infected or at risk of HIV, engaging in sex with multiple partners, having a sexually transmitted disease, and so on. Although women account for only 9 percent of reported AIDS cases, they account for 45 percent of those tested and 20 percent of those found infected in these public sector sites. Blacks and Hispanics are disproportionately represented, comprising more than 40 percent of those tested and more than 50 percent of those found to be infected (*4*).

Partner Notification

The sexual and needle-sharing partners of those infected with HIV are at high risk of becoming infected themselves (if not already infected). They may not realize, however, that they are at risk,

particularly if they are not users of injectable drugs or do not consider themselves to be homosexual men. Partner notification provides an opportunity to inform them that they are at risk of infection and how the risk of becoming infected can be reduced.

Confidentiality is critical to the partner notification process, which takes two different forms: patient referral and provider referral. With patient referral, infected persons are urged to inform sexual and needle-sharing partners personally of their exposure to infection. Provider referral involves health department personnel notifying partners of their exposure to an infected person. This is particularly useful if the infected person is unwilling or unable to notify partners. The name of the infected person is never revealed to partners during provider referral.

Partner notification procedures are in place in every State, although there is substantial variation in the relative emphasis of patient versus provider referral. Of partners who are contacted and undergo counseling and testing, a significant proportion are found to be infected—11.7 percent from the nationwide counseling and testing data, but as high as 30 percent in some locations (*4,5*).

Targeted Risk Reduction Education

In addition to the mass media campaigns, CDC is supporting risk reduction education activities targeted at people at increased risk, such as IV drug users and gay men. These approaches are designed to be culturally sensitive and linguistically appropriate. The educational messages include the need for behavior change to reduce risk, the benefits of early detection of infection, and the need to provide support to others as they attempt to sustain no (or low) risk behavior. Since the personnel of official agencies like health departments may not relate to people in these groups as effectively as peer members of the groups do, support is being provided through community-based organizations and through direct outreach programs. These programs use community workers to contact IV drug users, for example, who are not yet in drug treatment programs. CDC is currently supporting (either directly or indirectly) more than 700 community-based organizations to deliver these targeted education efforts.

Another category of persons at risk includes those who may be exposed to HIV as part of their work, particularly health care and public safety workers. Studies to assess the risk of different types of exposure are being carried out and guidelines developed to reduce risk of transmission.

Other Services

A variety of clinical services can help reduce the likelihood of HIV transmission or the progression of infection. These include appropriate diagnosis and management of genital ulcer disease, treatment to stop IV drug use, appropriate preventive therapy for tuberculosis infection, and provision of contraceptive services for HIV-infected women. CDC works with State and local governments and other Public Health Service agencies to see that these activities are supportive of HIV prevention programs.

Comment

Our approach to HIV prevention seems appropriate, given current knowledge and technologies. It has evolved in the last few years as more knowledge has been gained, and it will clearly change more in the future as surveillance and investigations tell us more about HIV infection and how to prevent or modify it. Given today's circumstances and knowledge, I believe that the two most serious questions about our actions are will they work and what should we be doing for those who are infected, but not ill.

Answers to the first question are not clear-cut. There is logic behind the idea that knowledge is essential for change (in this case behavior change). Knowledge alone may not be sufficient to bring about that change, however. Although we advocate followup counseling, our current counseling activities focus on two meetings—pre-test and post-test—in which there may be substantial emotional overlay that impedes optimal communication. In addition, we are seeking to bring about lifelong change in activities that may be deeply ingrained. Available evidence indicates that counseling and testing may bring about short-term changes in behavior, but we do not have much information about long-term changes. Logic would suggest that repeated counseling sessions are likely to be more effective in the long run. We recognize, however, that logic and belief are not enough, and we are firmly committed to evaluating all of our intervention strategies scientifically and rigorously. With many competing demands for our prevention resources, it is imperative that we find out what works and what does not.

Answers to the second question also are not clear-

cut. Recent evidence about the effectiveness of pentamidine chemoprophylaxis in preventing development of *Pneumocystis carinii* pneumonia (*6*) and zidovudine (AZT) in delaying onset of AIDS (*3*) indicate the desirability of identifying HIV infection early and getting those who are HIV-infected into a continuing, comprehensive program of medical care and social support. These programs also provide opportunities for continued risk reduction counseling and reinforcement. These programs are not yet developed in many areas; however, the recently enacted Comprehensive AIDS Resources Emergency (CARE) Act of 1990 provides a mechanism for their establishment.

Over time, our prevention activities will continue to evolve and become more effective. We believe our approach is sound and critically important to the nation's health.

References

1. Brandt, E. N., Jr.: Public Health Service's number one priority. Public Health Rep 98: 306-307, July-August 1983.
2. Allen, J. R., and Curran, J. W.: Prevention of AIDS and HIV infection: needs and priorities for epidemiologic research. Am J Public Health 78: 381-386, April 1988.
3. Volberding, P. A., et al.: Zidovudine in asymptomatic human immunodeficiency virus infection: a controlled trial in persons with fewer than 500 CD4-Positive cells per cubic millimeter. N Engl J Med 322: 941-949, Apr. 5, 1990.
4. Publicly funded HIV counseling and testing—United States, 1985-1989. MMWR 39: 137-140, Mar. 9, 1990.
5. Partner notification for preventing human immunodeficiency virus (HIV) infection—Colorado, Idaho, South Carolina, Virginia. MMWR 37: 393-396, 401-402, July 1, 1988.
6. Guidelines for prophylaxis against *Pneumocystis carinii* pneumonia for persons infected with human immunodeficiency virus. MMWR 38 (S-5) 1-5, June 16, 1989.

AIDS Knowledge in Low-Income and Minority Populations

JOHN F. ARUFFO, MD
JOHN H. COVERDALE, MB, ChB
CARLOS VALLBONA, MD

When this work was performed, all of the authors were with Baylor College of Medicine in Houston, TX. Dr. Aruffo was with the Department of Psychiatry and Behavioral Sciences at Baylor; he is now an Assistant Professor of Psychiatry at the University of Arkansas for Medical Sciences. Dr. Coverdale is a Fellow in Psychiatry in the Department of Psychiatry and Behavioral Sciences, and Dr. Vallbona is Professor and Chairman of the Department of Community Medicine, Baylor College of Medicine.

Dr. Rosalind J. Dworkin contributed to the statistical analysis. She is the Senior Medical Sociologist for the Department of Veterans Affairs Health Services Research and Development Field Program in Houston.

Tearsheet requests to John F. Aruffo, MD, University of Arkansas for Medical Sciences, Department of Psychiatry and Behavioral Sciences, 4301 West Markham, Mail Slot 554, Little Rock, AR 72205.

Synopsis

A convenience sample of 587 subjects was selected from the waiting areas of community health centers in Harris County, TX. They completed a structured interview that included questions on their knowledge of acquired immunodefiency syndrome (AIDS) transmission and prevention. Hispanic patients were interviewed in their preferred language. They were given a cumulative correct score for 10 questions on AIDS.

An ANOVA showed significant differences in knowledge between each racial group. Cumulative scores were whites, 78 percent correct; blacks, 68 percent correct; and Hispanics, 61 percent correct. Only 58 percent of Hispanics reported that using a condom during sexual intercourse lowered the risk of contracting AIDS, compared with 84 percent of whites and 83 percent of blacks. A regression analysis showed significant effects for both education and racial group, but not for age and sex. These findings show that knowledge of AIDS can be predicted according to the race and education of the population using these community health centers. Additional attention should be focused on educating low-income blacks and Hispanics about AIDS.

THE NUMBER OF BLACKS and Hispanics who contract acquired immunodeficiency syndrome (AIDS) is disproportionately high relative to their proportion of the population. Twenty-six percent of U.S. AIDS patients are black, and 13 percent are Hispanic. In the U.S. population, the propor-