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## Using Seroprevalence Data in Managing Public Health Programs

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### Synopsis .....

*An objective of the Centers for Disease Control (CDC) family of HIV seroprevalence surveys, conducted by State and local health departments, is the collection of seroprevalence data that may be useful in*

*managing public health programs. In prevention programs, seroprevalence data may be used in allocating resources, in determining the types and amount of education, counseling, and testing services offered, and in identifying access points for HIV-infected persons for medical followup and care. Over time, data will be useful in detecting and following trends in HIV infection and in evaluating the impact of program activities to prevent HIV infection.*

*No single seroprevalence survey is representative of the entire population of a metropolitan area. Each type of survey has strengths and limitations that must be considered when interpreting seroprevalence data. However, results from the family of surveys are the best available data because they are relatively unaffected by self-selection bias, they are standardized, and the information is collected over time. Characterization of the population surveyed and adherence to standard CDC protocols improve the quality of the data. Consultants in health departments and at CDC form a network for providing technical support and disseminating data to health care providers and program managers.*

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**T**HE CENTERS FOR DISEASE CONTROL (CDC), in collaboration with State and local health departments and other agencies, is conducting human immunodeficiency virus (HIV-1) seroprevalence surveys in clinics, population-based surveys, and surveys of special populations. The purpose of the family of surveys is to monitor the levels and trends of HIV infection in the United States, using a sentinel surveillance system, and to provide information useful in managing HIV prevention programs (1). Data from the family of surveys will be useful on both national and local levels. National data will help public health officials to plan better for future health needs and to evaluate changes in the HIV epidemic. For local and State health officers, data from blinded (test results not linked to identifiable persons) surveys in their clinics and for their metropolitan areas will directly assist in managing HIV prevention programs.

### Communicating Seroprevalence Survey Data

The first priority in planning to use blinded survey data is the communication of results to persons and institutions that need to know and will use the data. A

working group of key persons is constituted in each local area. Members of the working group usually include survey personnel, epidemiologists, directors of sexually transmitted disease (STD) programs and clinics, directors of maternal-child health and drug treatment agencies, and personnel of AIDS surveillance and prevention programs.

The working group begins by reviewing the methods and design of the surveys so that results can be better understood. The working group's responsibilities include evaluation of survey operations to identify areas where data may not be complete or incorrectly collected and to compare and contrast data from different sources. For example, the group also considers information from acquired immunodeficiency syndrome (AIDS) case surveillance, from the HIV reporting system (if present in the State), and risk behavior information from the nonblinded (voluntary) surveys. The group identifies gaps in knowledge or important unserved populations and makes decisions about future surveys. Summaries of data are released in a timely manner to State and local health officials and political leaders, to directors of hospitals and medical societies, and to the general community. One or more spokesper-

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sons appointed by the group presents data to the media and other interested agencies and is available to answer questions.

### **Interpreting Data from Sentinel Surveys**

The groups selected for clinic surveys are patients attending STD, tuberculosis (TB), and women's health clinics (WHC) and drug treatment centers (DTC) (2–5). STD and DTC clients were chosen to represent persons who are at increased risk of HIV infection because of their behaviors. WHC clients represent a population of public health importance because of the risk of perinatal transmission from an infected mother to her child. An increasing number of HIV-infected patients are found in TB clinics since HIV infection activates latent *Mycobacterium tuberculosis* infection and, in addition, these patients have an increased risk of severe tuberculous disease. None of these groups are representative of the entire population of the metropolitan area, but they are excellent sentinel populations in which to detect significant increases in HIV infections. In contrast, women of all racial, ethnic, and social groups in a State or a statistically representative sample (6), are included in the survey of women delivering liveborn children.

The STD, TB, WHC, and DTC clinics were chosen as survey sites because they are accessible to health departments and offer opportunities for both surveillance and prevention activities in populations that are important to the control of HIV infection and that urgently need interventions. However, clinic patients are not a representative sample of all persons with a given illness or condition in a metropolitan area. Currently, clinics have been chosen by local health departments to provide information on different demographic and geographic segments of the clinic population that were deemed important to health departments' prevention efforts. Because not all clinics were included in the survey, and the participating clinics were not chosen at random, survey clinics are not likely to be representative of all clinics in the metropolitan area.

The criteria for including serums in the blinded surveys differ for each of the four clinic surveys. Some biases are introduced by these criteria (2–5). In blinded

surveys, since the patient's consent is not obtained, HIV testing is performed only on blood taken for another purpose during the patient's visit. Clinic policies and the physician's orders determine which clients will receive routine blood testing. If certain types of clients are always included or always excluded from the survey, seroprevalence results may under- or overestimate the true infection rate.

### **Monitoring HIV Infection**

No single survey will provide all the information needed on the levels and trends of HIV infection in the entire population. The components of the family of surveys contribute to the overall impression of the status of HIV infection. The data collected may be viewed as indicators of HIV infection in the community. The STD clinic and DTC surveys provide a measure of the highest infection rates expected. The Survey of Childbearing Women provides data on all childbearing women with and without risks for HIV infection. The family of surveys data are sufficiently focused by type of risk and demographic and geographic subgroup to identify needs for prevention activities.

A primary value of the blinded components of the family of surveys is to monitor trends in infection. Repeated cross-sectional surveys in the same clinics of the same client demographic and risk groups using the same methodology and at the same time each year should yield comparable data. When standard survey protocols and procedures have been used, seroprevalence data from different periods may be compared. Trends in seroprevalence noted should reflect trend patterns in the community. These data are the best that will be available because they are relatively unbiased by self-selection, standardized across the country, and collected over time.

Incidence is the rate of new infections occurring in a given population at risk during a given period. Incidence may be estimated indirectly from results of cross-sectional seroprevalence surveys conducted at different points in time in the same clinics using the same methodology.

### **Monitoring Risk Behaviors**

If blinded surveys demonstrate greater than 1 percent seropositivity in clinic clients, nonblinded surveys are conducted. In these surveys, clients receiving voluntary HIV counseling and testing are interviewed about behaviors that may facilitate or prevent transmission of HIV. Interviewers use a standard CDC questionnaire. In some areas, interview data from the nonblinded surveys provide the only systematically collected informa-

tion available about the sexual and drug-using practices of clinic clients. As educational programs are instituted in the clinic, changes in the proportion of clients using specific preventive measures, such as condoms or bleach disinfection of needles and syringes, can be detected.

### **Implementing Prevention Activities**

State and local health departments have developed a wide variety of programs aimed at preventing HIV infection. These programs seek to reduce or eliminate behaviors that transmit HIV. The funds and personnel to provide prevention services are limited, and the most effective use of these limited resources is to provide services to clinics according to the likelihood of their clients' exposure to HIV. For clinics serving those not yet infected with HIV, educational programs to increase awareness of AIDS and the routes of transmission will suffice. For clinics with low HIV prevalence (for example, less than 0.5 percent) as shown by blinded surveys, assessment of risky behaviors during the clinic visit and individual counseling are indicated. Clinics serving populations with higher prevalence of HIV should receive additional personnel, space, and other resources needed to offer more intensive HIV prevention services routinely, including voluntary counseling and HIV testing in the clinic, assistance with notification and follow-up of sexual and needle-sharing partners of infected clients, and support groups for seropositive persons and their partners (7). As resources permit, expansion of services to clinics and communities serving smaller numbers of infected persons is recommended (7).

Counselors can personalize their advice to clients concerning the risk of infection by telling them of the seroprevalence rates found in persons with similar behaviors who have attended the same clinic. Clinic staff need to be aware of these data and encouraged to use them in counseling sessions.

Seroprevalence rates by zip code or health district may be used to locate new STD and WHC clinics, community health care facilities, and DTC and outreach activities in areas with higher HIV seroprevalence. For example, State and local health department staffs are identifying new and innovative uses of sentinel data to guide their preventive programs. In New York City, data from the Survey of Childbearing Women in 1987–88 were analyzed by zip code and showed a high correlation with hospital-specific, drug-related discharges (8). These findings triggered a series of programs. Preventive measures were implemented that focused on drug treatment and prenatal care services. Contracts with providers of prenatal and family planning services were amended to require provision of on-site HIV coun-

seling and testing. Obstetricians and other physicians were advised of the need to provide education and HIV counseling and testing for women of reproductive age. Community health workers were trained and assigned to neighborhoods with a high number of HIV-infected women; promoting enrollment of pregnant women in prenatal care is a prime objective of the program. Programs to prevent and treat drug abuse were strengthened.

In New Jersey, greatly expanded AIDS educational programs are planned to target persons whose behavior puts them at increased risk of infection or who live in areas where rates of infection are high; eight counties were given initial priority for the programs (New Jersey Department of Health press release, June 15, 1989). According to the Illinois Department of Public Health, a review of data from blinded clinic surveys indicated that "the high positivity rate among intravenous drug users coming in for substance abuse treatment bolsters the need for expansion of drug treatment services, and the alarmingly high rate of infection among Hispanic intravenous drug users underscores the need for culturally sensitive community services for Chicago's Hispanic neighborhoods" (Illinois Department of Public Health news release, June 15, 1989).

### **Implementing Treatment Services**

Recent studies have shown that preventive treatment may delay the onset of HIV-related symptoms and opportunistic infections (9, 10). The availability of effective therapy for HIV infection will encourage use of HIV testing and increase the number of asymptomatic infected persons needing care. Current recommendations for seropositive persons call for medical assessment including CD4+ lymphocyte studies every 6 months, zidovudine (AZT) therapy, and prophylaxis with aerosol pentamidine every 4 weeks or oral trimethoprim-sulfamethoxazole if indicated (10). As new antiviral agents become available, HIV infection will take on additional characteristics of a chronic disease, and publicly supported long-term treatment facilities will be needed for infected persons who do not have private sources of medical care. Psychosocial support for infected patients, partners, and families will also be required. Locating these treatment services in clinics where infected persons are receiving other medical care or drug treatment will increase the likelihood they will use the services. Comprehensive HIV treatment facilities can be targeted for communities with high rates of infection.

Comprehensive HIV treatment facilities have been established as pilot projects by the California Department of Health Services in two communities (11). Entry

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into the program is available to any HIV seropositive person. In addition to medical evaluations and care at 4-month intervals, a 5-week education course provides information on preventing transmission of infection. Group and individual sessions reinforce behavior modification messages. These centers may become the focus of HIV treatment and prevention efforts in the community.

### **Program Evaluation**

Data from blinded seroprevalence surveys, particularly on the number of clients who are seropositive, can be used by clinics to measure their success at reaching infected clients through counseling, testing, and educational programs. Voluntary counseling and testing were accepted by 82 percent of men attending an STD clinic; 8 of the 789 men tested were seropositive (1 percent) (12). However, when all 949 men attending the clinic were tested, an additional 9 seropositives were found (overall seroprevalence rate of 2 percent). Thus, voluntary testing was not accepted by half of all infected men attending the clinic. Furthermore, results showed that refusal rates were highest among infected black and Hispanic men.

This example demonstrates that data from blinded surveys can be used to assess the proportion of infected persons that are receiving counseling and followup. HIV-infected persons who continue to contract STDs or who share contaminated needles and syringes represent failures of clinic prevention programs. When voluntary programs do not attract all seropositive persons, modifications in the ways that counseling and testing are offered and more culturally sensitive programs are indicated. Recruitment of these seropositive persons is particularly important to encourage them to join treatment programs.

### **Conclusion**

Information on rates of infection may be very effective in persuading health professionals and political and

community leaders of the need for additional resources, personnel, and programs for clinics serving infected clients. The identification of HIV positive persons among clinic clients and in communities far from the inner cities through the Survey of Childbearing Women indicates that HIV infection is a concern in all areas of the United States. The possibility of effective prophylaxis and treatment for asymptomatic HIV infected persons underscores the importance of using seroprevalence survey data to target programs that will effectively reach these persons and their at-risk partners.

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