National
HIV Serosurveillance Summary

Results through 1992

Volume 3

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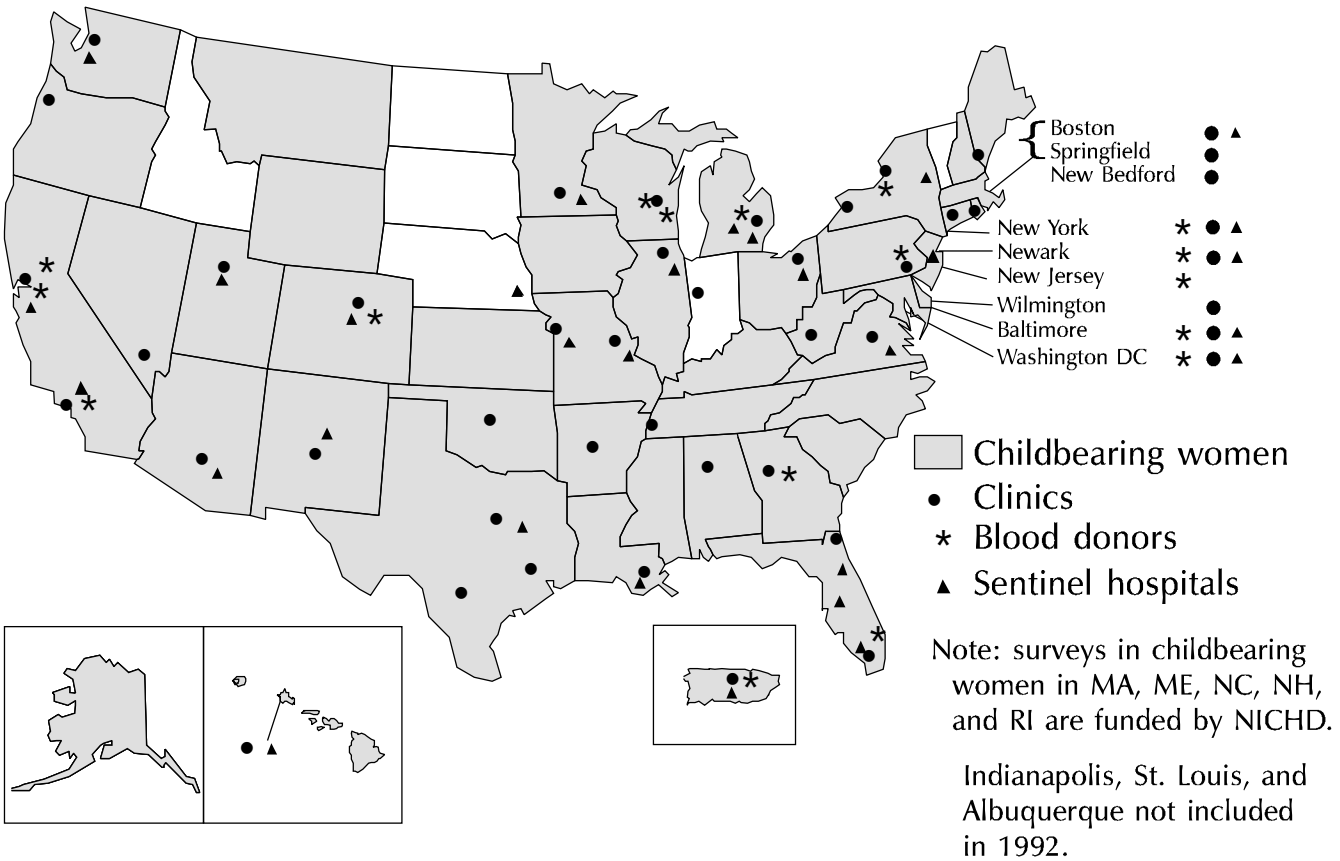
U.S. Public Health Service National HIV Serosurveillance

Background

As part of a surveillance system to monitor the human immunodeficiency virus (HIV) epidemic in the United States, the Centers for Disease Control and Prevention (CDC), in collaboration with state and local health departments, other federal agencies, blood collection agencies, and medical research institutions, conducts standardized HIV seroprevalence surveys in designated subgroups of the U.S. population. These surveys are conducted annually in selected sentinel sites throughout the country. The objectives of the sentinel serosurveillance are 1) to provide state and local health officials and the general public with information on the HIV prevalence in various populations, so that education and prevention programs can be developed, targeted, and evaluated; 2) to indicate the magnitude and extent of HIV infection by demographic and behavioral subgroup and by geographic area; 3) to indicate regional and national changes over time in the prevalence of infection in specific populations defined by HIV risk behaviors and demographic characteristics; and 4) to assist in projecting the number of children and adults who will develop HIV-associated illness and require medical care.

In 1988, CDC began providing technical and financial assistance to state and local health departments to conduct HIV seroprevalence surveys in selected clinical settings. Clinics were supported in 46 metropolitan areas during 1991 and 1992 (Figure 1). These settings included sexually

Figure 1. Metropolitan areas and states participating in CDC's National HIV Serosurveillance Program, 1991-1992



transmitted disease (STD) clinics, drug treatment centers, women's reproductive health clinics, tuberculosis (TB) clinics, adolescent and young adult clinics, clinics serving homeless populations, and clinics serving juveniles and adults in correctional facilities.

State and local health department personnel chose clinics to participate in the surveys based on the facility's size, its public health importance in the community, the variety of demographic and behavioral subgroups served, and the ability and willingness of the facility's staff to conduct surveys in accordance with the standardized protocols.

Three CDC-supported surveys include persons seeking medical care in locations other than specialized clinics. During 1991 and 1992, 39 hospitals, many located in the same metropolitan areas as the clinic surveys (Figure 1), participated in a sentinel surveillance system. This system focuses on persons treated at hospitals, including outpatient and emergency services, for reasons unrelated to HIV infection or major HIV risk behaviors. Ongoing surveillance of HIV in primary care outpatients was also conducted by a consortium of over 250 physicians belonging to the Ambulatory Sentinel Practice Network. These two surveys of persons seeking medical care in general hospital or primary health care settings allow sampling of all age groups and both sexes from a broad cross-section of the population. The third survey includes American Indians and Alaska Natives receiving care for sexually transmitted diseases, prenatal care, or drug treatment at Indian Health Service-sponsored facilities.

Forty-four states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands received assistance* during 1991-1992 to conduct state- or territory-wide seroprevalence surveys among childbearing women (Figure 1). This national survey measures the prevalence of HIV infection among women delivering live infants. Because it is population-based (i.e., measuring HIV prevalence in populations defined by geographic boundaries), data from this survey can be compared with national health data from other sources.

All of these surveys use anonymous, unlinked (blinded) HIV testing. In unlinked surveys, samples gathered from discarded blood originally collected from consecutive eligible clients for routine diagnostic purposes are tested for HIV antibodies after all personal identifying information has been removed. The HIV test results as well as risk information obtained from medical records cannot be linked to specific individuals. Unlinked surveys are conducted to obtain HIV seroprevalence estimates that are unbiased by client self-selection. Previous studies in many settings suggest that persons who know or suspect that they may be infected with HIV or at risk for infection may be less likely to participate in HIV studies, possibly causing the observed seroprevalence to decrease. All clinic sites conducting unlinked surveys either offer referral for or directly provide voluntary HIV counseling and testing.

CDC obtains data from three additional sources: routine HIV screening by the Department of Labor of residential Job Corps entrants, HIV screening by the Department of Defense of civilian applicants for military service, and HIV screening by blood collection agencies of blood donations. Personal identifiers are not sent to CDC.

Two previous summaries reported results of the HIV serosurveillance activities from surveys in sentinel sites conducted through 1989 and through 1990. The focus of this third summary is data from the Survey in Childbearing Women and from sentinel clinic and hospital sites during 1991 and 1992. Although comprehensive analyses of prevalence trend data from the clinic sites are beyond the scope of this report, general comparisons of

* Five of these states (Maine, Massachusetts, New Hampshire, North Carolina, and Rhode Island) received their support from the National Institute of Child Health and Human Development.

seroprevalence data with data gathered from the same sites during 1989 and 1990 are included. Data are presented from screening of military applicants and blood donors since 1985, from screening of residential Job Corps entrants since 1988, and from the Survey in Childbearing Women since 1988. The data in this report relate to human immunodeficiency virus type 1 (HIV-1) infection and are summarized by geographic area, sex, age, and race or ethnicity, and when possible by behavioral risk factors for HIV.

To better reflect the current dynamics of the HIV epidemic, this report is organized differently from the two previous summaries. Separate sections now focus on surveys of adolescents and young adults and on surveys of women to underscore the increasing impact of the HIV epidemic among these populations. A new section on interpretation of data provides a framework for understanding HIV prevalence trend data. A new section discussing interpretation of findings and conclusions provides a more in-depth analysis of the HIV serosurveillance results.

Collection and Interpretation of Data

Participating clinics, hospitals, and medical practices annually conduct unlinked surveys following standardized protocols. Annual survey periods range from 2 weeks to 12 months, depending on the nature of the group surveyed, characteristics of the survey site, and desired sample size. For the Survey in Childbearing Women, state health departments conduct unlinked testing during annual survey periods that range from 3 to 12 months. To ensure comparability of data, standardized protocols and laboratory procedures are used for surveys of each population group.

The data from clinics and hospitals in this summary are presented as medians and ranges of rates for individual sites rather than as aggregate data because these participating sites were not a probability sample and the proportion of clients sampled differed within each site. The sentinel clinic and hospital populations serve as indicators of HIV patterns and trends over time but are not representative of all persons attending clinics or hospitals or of the community as a whole. Since the data provide estimates of seroprevalence for various clinic and hospital populations in different geographic regions, the surveys collectively suggest geographic patterns of HIV infection.

Because most of the CDC-supported HIV serosurveys included in this report began in 1988 or 1989, data from several years are now available. To facilitate trend analyses, the same clinics are included in the sentinel surveys each successive year whenever possible. However, logistical considerations and changing local public health priorities may result in clinics being newly included in or discontinued from the surveys. Changing client populations may also influence longitudinal prevalence trends in the same clinic. These factors, along with the non-random selection of clinics included in the surveys, complicate the trend analyses of sentinel clinic HIV seroprevalence data.

CDC monitors the results of routine HIV screening of civilian applicants for military service, Job Corps entrants, and blood donors. Although geographically diverse, each of these groups is disproportionately composed of persons with particular demographic and socioeconomic characteristics. In addition, persons with known HIV infection or with risk factors for HIV are excluded from two of the groups, military applicants and blood donors. These exclusions and the associated self-selection bias may considerably reduce the observed seroprevalence and may influence trends in these two groups.

All of the surveys in this report measure HIV seroprevalence, which is the proportion of persons who have serologic

evidence of HIV infection at a given time. Seroprevalence, which is used interchangeably with prevalence in this report, is influenced by the rate of new HIV infections (incidence) and by attrition of HIV-infected persons from the population under study, often through illness or death. Thus, temporal changes in seroprevalence result from an imbalance between incidence and attrition. If incidence is greater than attrition, the prevalence will increase over time. Conversely, if attrition is greater than incidence, prevalence will decrease over time. Observed prevalence trends are also influenced by changes in the composition of the population under study. For example, an increase in referrals of HIV-infected persons to a drug treatment clinic may increase the observed prevalence in clients entering that clinic regardless of underlying prevalence trends among all drug users in the population served by the clinic.

HIV seroprevalence is a good indicator of future morbidity and health delivery needs because it measures the level of HIV infection in a population. However, incidence is the best measure of the need for and efficacy of prevention programs. Incidence is much more difficult to measure than prevalence, and incidence studies are not easily conducted on a national scale. Nevertheless, inferences about HIV incidence can be made from measuring prevalence trends, especially among adolescents and young adults. Because of the recency of onset of their sexual activity or use of injecting drugs, HIV prevalence among young persons represents cumulative incidence over a relatively short period of time. If a narrowly defined group, such as persons aged 16 to 21 years entering the Job Corps, is measured annually, a stable prevalence over time suggests stable incidence. In contrast, prevalence among older persons is influenced by both incidence and attrition. A stable prevalence over time indicates that incidence and attrition are approximately equal. If prevalence is high, incidence can be considerable even when the observed prevalence is unchanging.

Seroprevalence data from a single site should be interpreted with caution because the representativeness of the sample population may be unknown and the composition of the sample population may be subtly changing over time. Inferences about patterns and trends of HIV infection should be made only when consistent results are observed among sampled clinics and populations.

Summary of Findings

During 1991-1992, HIV seroprevalence rates exceeded 15% among men who had sex with men in nearly every participating STD clinic (median clinic prevalence 25.5%). The absolute HIV prevalence among these men decreased a median of 5.7% from 1989-1990 among the 42 clinics with a sufficient number of men tested during both time periods. HIV seroprevalence was also high among injecting drug users entering drug treatment centers (median clinic prevalence 7.5%) or attending STD clinics (median clinic prevalence 5.4%). In contrast to men who had sex with men, the HIV seroprevalence among injecting drug users was markedly diverse, with prevalence rates from 15% to 40% in most cities in states along the Atlantic Coast and in Puerto Rico and prevalence rates generally below 7% elsewhere. HIV seroprevalence rates in participating STD clinics, generally remained below one percent, with no clear trend in prevalence, among persons who neither injected drugs nor had male homosexual contact (median clinic prevalence 0.9% men, 0.6% women).

In 1991-1992, seroprevalence remained below one percent among most adolescent populations (civilian applicants for military service, 0.06%; Job Corps entrants, 0.27%; adolescent medicine clinics, 0.3%; and juvenile detention centers, 0.1%). Homeless and runaway youth populations had substantially higher seroprevalence (median clinic prevalence 2.6%), but only five clinics were sampled. Trend data are available from the Job Corps

entrants since 1988 and from applicants for military service since 1985. Both populations had marked decreases in seroprevalence among men and either stable (applicants for military service) or increasing (Job Corps entrants) seroprevalence among women.

Blacks had a substantially higher seroprevalence than whites in nearly every serosurveillance population. For example, in STD clinics, among men who have sex with men, black men had higher HIV prevalence (median 43.6%) than white men (median 23.2%). Similarly, among injecting drug users, blacks had higher seroprevalence (median 18.4%) than whites (median 3.8%). Black childbearing women were three to 28 times more likely to be seropositive than childbearing women of other race/ethnicities in 21 states that collected data on race/ethnicity. In the Western states, HIV seroprevalence was generally similar among Hispanics and whites, while in states along the Atlantic Coast, seroprevalence was generally higher among Hispanics than among whites.

During 1991-1992, the sentinel hospital study showed a nearly 60-fold variation in HIV seroprevalence (range 0.1%-5.6%) in different urban areas. Statewide seroprevalence among childbearing women also varied considerably (range 0.0% to 0.60%). Nationally, the seroprevalence among childbearing women increased slightly, from 0.16% to 0.17% from 1989-1990 to 1991-1992; however, seroprevalence among childbearing women increased from 0.17% to 0.21% in the South and decreased from 0.41% to 0.36% in the Northeast during these two time periods.

Surveys of Adolescents and Young Adults

Adolescent Medicine Clinics

Twenty-one clinics in 12 metropolitan areas were funded in 1991 and 1992. These clinics included community-based teen clinics, hospital-based adolescent programs, and school-affiliated clinics. They offered a wide range of services, including family planning, physical exams, STD treatment, prenatal care, counseling, and general medical care. Clients who initially visited the clinic during the survey period and who had a blood specimen drawn as part of routine clinic services were eligible for inclusion in the survey. Clients who visited the clinic for HIV testing, for evaluation or treatment of HIV infection, or for follow-up visits during the survey period were excluded.

During 1991 and 1992, 11,852 specimens were collected and tested (Table 1). HIV seroprevalence ranged by center from 0.0% to 1.4% (median 0.3%). HIV seroprevalence was generally similar among males (median 0.1%, range 0.0-1.4%) and females (median 0.2%, range 0.0-1.4%). There was no consistent geographic pattern of seroprevalence. This finding may reflect the variety of populations served and services offered at each of these clinics. Overall, seroprevalence increased with age, rising from 0.2% among persons less than 15 years of age to 0.5% among those 20-24 years of age. Over half of the females presented for either prenatal care or family planning services; approximately one in 200 (0.5%) were HIV seropositive.

Clinics for Homeless and Runaway Youth

In 1991 and 1992, five homeless and runaway youth clinics in four cities conducted unlinked seroprevalence surveys. Criteria for including or excluding clients were the same as those for adolescent medicine clinic surveys. A total of 3,704 specimens were collected and tested (Table 1). HIV seroprevalence ranged by center from 0.0% to 6.3% (median 2.6%). HIV seroprevalence was generally higher among males (median 4.5%, range 0.0-8.9%) than among females (median 1.2%, range 0.0-3.2%).

At four clinics, HIV risk information was gathered during routine clinical care. Because the anonymous, unlinked survey design did not allow risk information to be validated, the prevalences of certain risk behaviors, such as male homosexual contact and injecting drug use, were probably underestimated. Nevertheless, the prevalences of recorded HIV risks were high. From 4% to 28% of all male clients at the four clinics had a recorded history of sex with men; this risk behavior accounted for 25% to 95% of all HIV infections among men at each clinic. Among women, those who were heterosexually active and did not have a recorded history of injecting drugs accounted for 66% to 100% of the HIV infections among women. Injecting drug use accounted for few HIV infections; fewer than 2% of clients at three clinics and 17% at one clinic reported injecting drugs. Overall, only six (6%) of the 103 HIV-seropositive clients at these four clinics reported injecting drugs.

Although the five clinics at which the surveys were conducted may not represent other clinics serving homeless and runaway youth, these data suggest that a substantial proportion of homeless youth are at increased risk for HIV, among men primarily through sex with men and among women through heterosexual contact. Injecting drug use was infrequently reported by clients at three of the four clinics; however, additional studies in other areas would be required to determine the extent of HIV transmission through injecting drug use among homeless and runaway youth populations.

Juvenile Detention Centers

During 1991 and 1992, seroprevalence surveys were conducted in eight juvenile detention centers in seven cities. Criteria for including or

Table 1. Summary of HIV seroprevalence data from adolescent clinics by clinic setting and sex, 1991-1992

Clinic setting and client gender	Total centers[1]	Total specimens tested[2]	Centers analyzed[3,4]	Percent positive Median[5]	(Range)[6]
Adolescent medicine clinics					
Males	21	3,345	10	0.1	(0.0 - 1.4)
Females	21	8,459	19	0.2	(0.0 - 1.4)
Total[7]	21	11,852	21	0.3	(0.0 - 1.4)
Homeless and runaway youth clinics					
Males	5	1,699	5	4.5	(0.0 - 8.9)
Females	5	1,989	5	1.2	(0.0 - 3.2)
Total[7]	5	3,704	5	2.6	(0.0 - 6.3)
Juvenile detention centers					
Males	8	6,637	8	0.1	(0.0 - 1.0)
Females	6	804	4	0.2	(0.0 - 2.6)
Total[7]	8	7,470	8	0.1	(0.0 - 1.7)

1 Includes centers funded to conduct unlinked surveys in 1991 and 1992.
2 Includes all specimens tested in 1991 and 1992.
3 Includes only clinics reporting at least 50 specimens collected and tested according to CDC protocol.
4 Gender analyzed for centers reporting at least 50 specimens per group.
5 The median rate for centers in each category.
6 Range is the lowest and highest rates of centers in each category.
7 Total includes persons with gender not recorded.

excluding clients were the same as those for the adolescent medicine clinic surveys. A total of 7,470 specimens were collected and tested (Table 1). HIV seroprevalence ranged by center from 0.0% to 1.7% (median 0.1%). Seven of the eight centers had an HIV seroprevalence less than 0.2%.

These data suggest that the seroprevalence among juveniles incarcerated at detention centers is much lower than among incarcerated adults (Table 4).

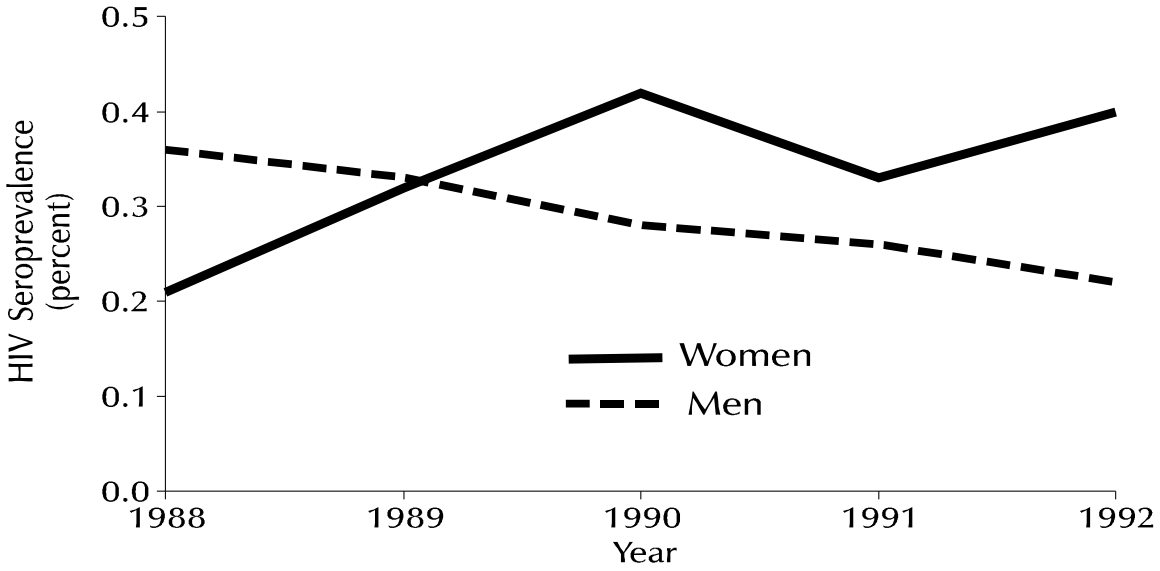
Job Corps Centers

Since late 1987, approximately 60,000 Job Corps entrants have been screened each year for HIV. The Job Corps is a residential occupational training program for urban and rural disadvantaged youth ages 16 to 21 years. The training program, administered by the U.S. Department of Labor at 106 sites throughout the country, has no exclusions based on sexual orientation, hemophilia, or past use of illegal drugs. Current use of illegal drugs, however, is a cause for exclusion.

The Job Corps data from 1988 through 1992 indicate that many disadvantaged adolescents and young adults, especially from minority populations, acquired HIV infection during this time. The overall HIV seroprevalence for Job Corps entrants from 1988 through 1992 was 0.30%. The HIV seroprevalence among males has steadily decreased, while among females it increased notably from 1988 through 1990 and then remained relatively stable (Figure 2) through 1992. During 1991 and 1992, the overall HIV seroprevalence was 0.27%. Seroprevalences were higher among blacks and Hispanics than among whites (Figure 3).

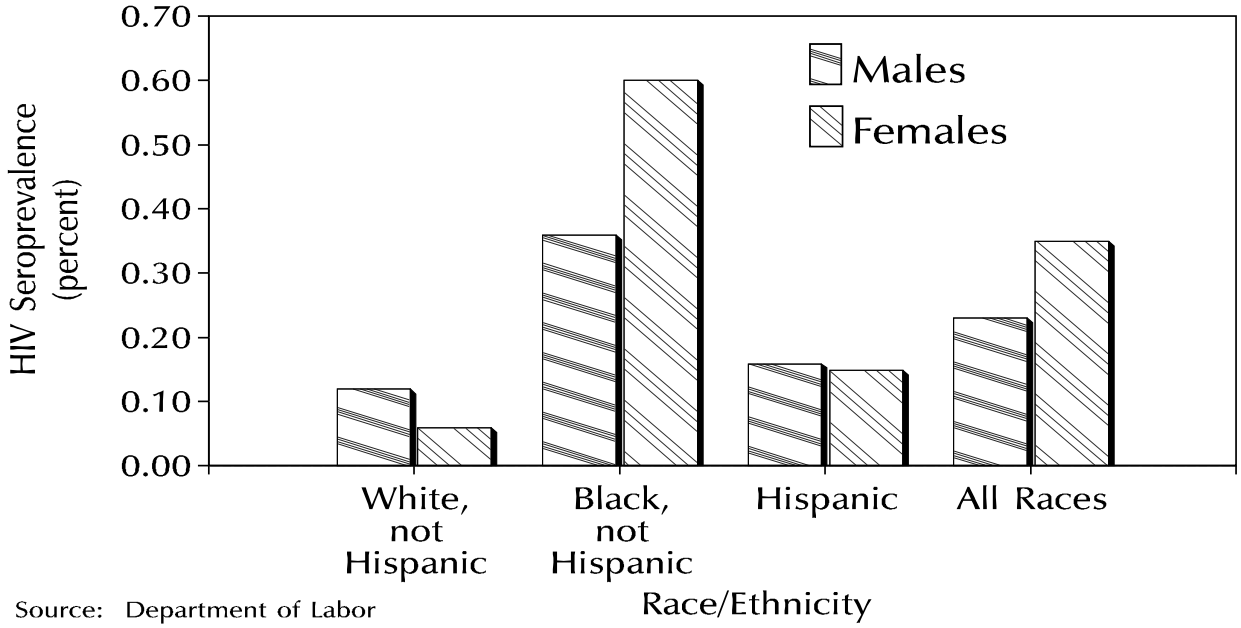
In 1991-1992, seroprevalence was lower among males (0.23%) than among females (0.35%); however, this pattern varied by race/ethnicity (Figure 3). The prevalence ranged from 0.11% among men 16 years of age to 0.48% among men 21 years of age and from 0.24% among women 16 years of age to 0.70% among women

Figure 2. HIV seroprevalence among Job Corps entrants, by sex and date of entrance*, January 1988 through December 1992



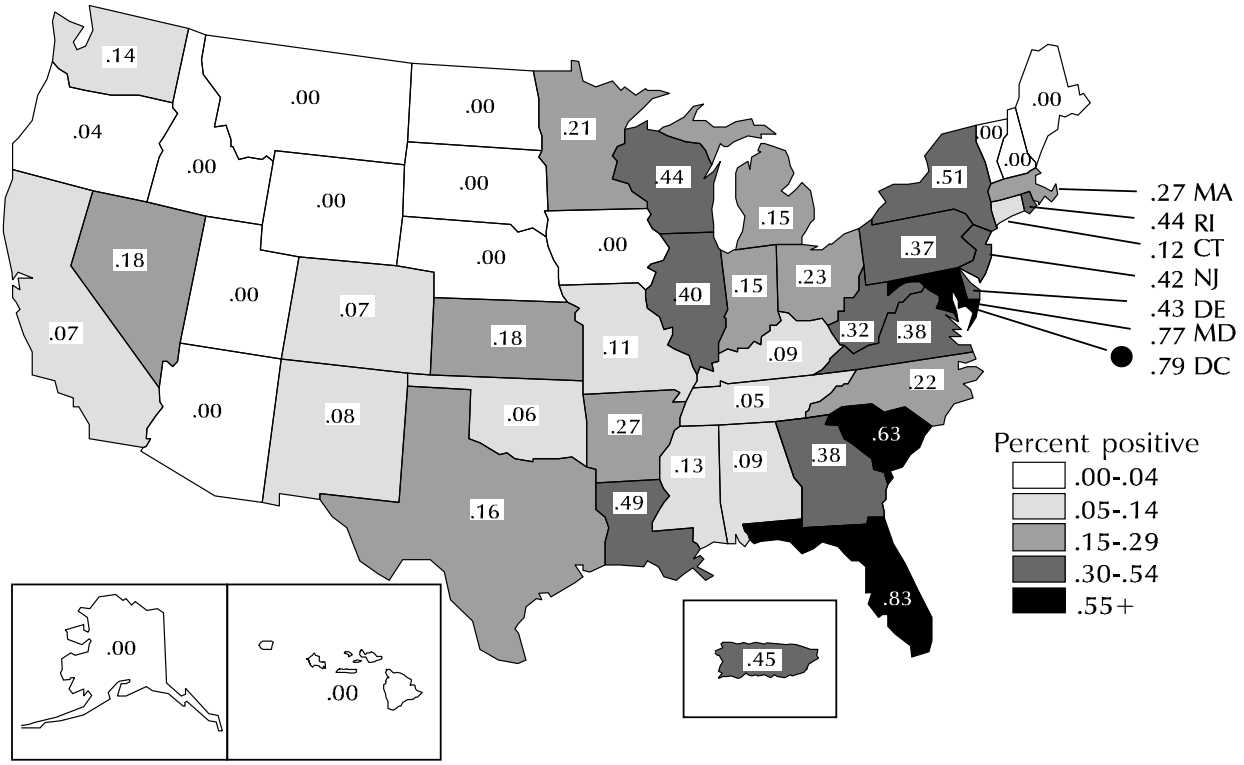
*Annual prevalences were adjusted for differences in age, race/ethnicity, region, and MSA.

Figure 3. HIV seroprevalence among Job Corps entrants, by sex and race/ethnicity, United States, January 1991 through December 1992



Source: Department of Labor

Figure 4. HIV seroprevalence among Job Corps entrants by state of residence, January 1991 through December 1992



Source: Department of Labor

21 years of age. The finding that young black women had higher HIV prevalences than young black men suggest a prominent role of heterosexual transmission in this group. Because young women tend to have sex with older men, rates of sexually transmitted diseases are generally higher among women than among men in the youngest age groups.

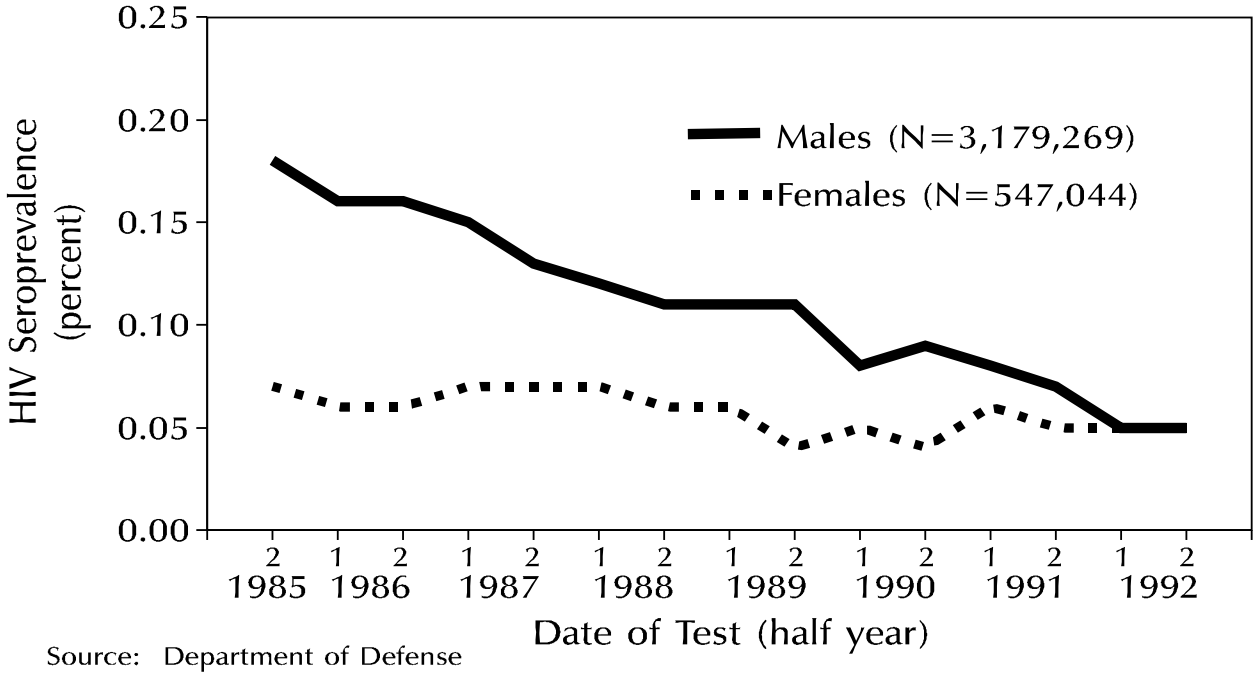
Overall, seroprevalence was higher in the Northeast and South than in the Midwest and West (Figure 4). However, the seroprevalence among white Job Corps entrants varied little by geographic region, while that among black and Hispanic entrants varied substantially by region and accounted for the overall observed geographic pattern.

Civilian Applicants for Military Service

Since October 1985, each year approximately 400,000-650,000 civilians applying for active duty or reserve military service, the service academies, and the Reserve Officer Training Corps have been screened for HIV antibody as part of their medical evaluation. Data from this group are important because of the large number of persons screened and because the applicants include both sexes and all racial and ethnic groups from all areas of the country.

Through 1992, before medical evaluation, applicants were interviewed about drug use and homosexual activity, both of which were grounds for exclusion from entry into military service. Potential applicants were informed that they would be screened for HIV antibody and excluded from entry if infected. Therefore, injecting drug users, men who have sex with men, and persons who suspected or were

Figure 5. HIV seroprevalence among civilian applicants for military service by test date and sex, United States, October 1985 through December 1992



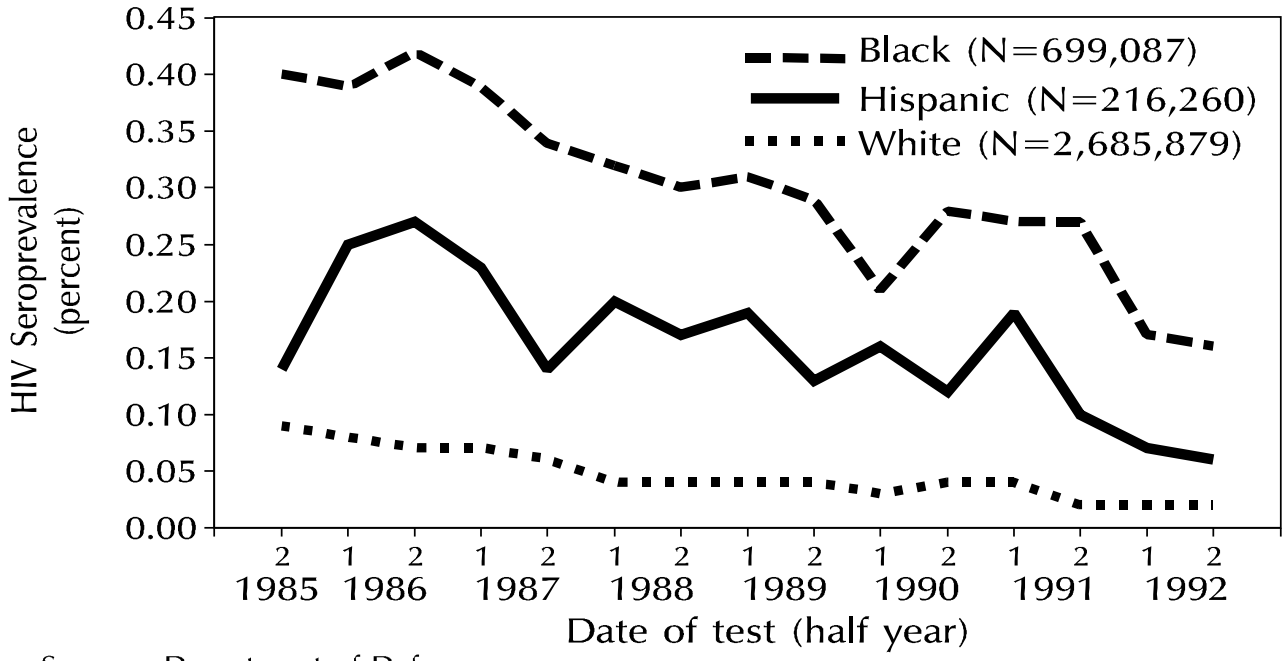
Source: Department of Defense

already aware they were infected with HIV were likely to have been underrepresented among those applicants actually tested.

From October 1985 to December 1992, over 3.7 million applicants were tested; the cumulative HIV seroprevalence was 0.11% (about 1 positive for every 940 tested). The HIV seroprevalence decreased during this time, especially among men. In 1991 and 1992, the overall prevalence was 0.06% (about 1 positive for every 1640 tested). Before 1988, the HIV seroprevalence was more than twice as high among male than among female applicants (Figure 5). Because HIV seroprevalence has decreased faster among men, by 1991 and 1992 rates were only slightly higher among men (0.06%) than among women (0.05%) (Figure 5). Since 1985, rates have also decreased among the three largest racial and ethnic groups (Figure 6). However, rates remained substantially higher among Blacks (0.22%) and Hispanics (0.10%) than among American Indians and Alaska Natives (0.02%), whites (0.02%), or Asians and Pacific Islanders (0.01%)(Figure 7). Overall seroprevalences adjusted for race/ethnicity were 0.06% for men and 0.03% for women.

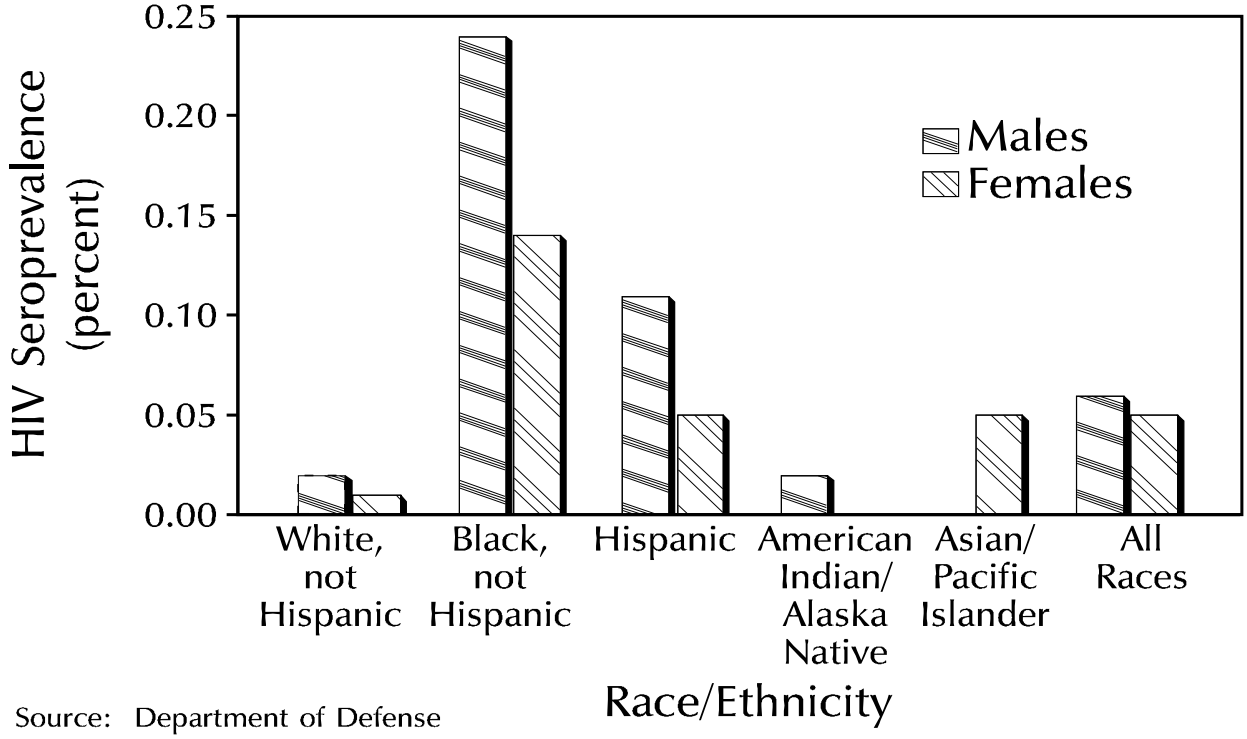
HIV prevalence rates were highest in the Middle Atlantic states and Puerto Rico and lowest rates in the central Midwest and Mountain states (Figures 8 and 9). This geographic pattern of HIV infection rates was similar to patterns from surveys among childbearing women (Figure 11) and among injecting drug users (Tables 3 and 5; Figure 12).

Figure 6. HIV seroprevalence among civilian applicants for military service by test date and race/ethnicity, United States, October 1985 through December 1992



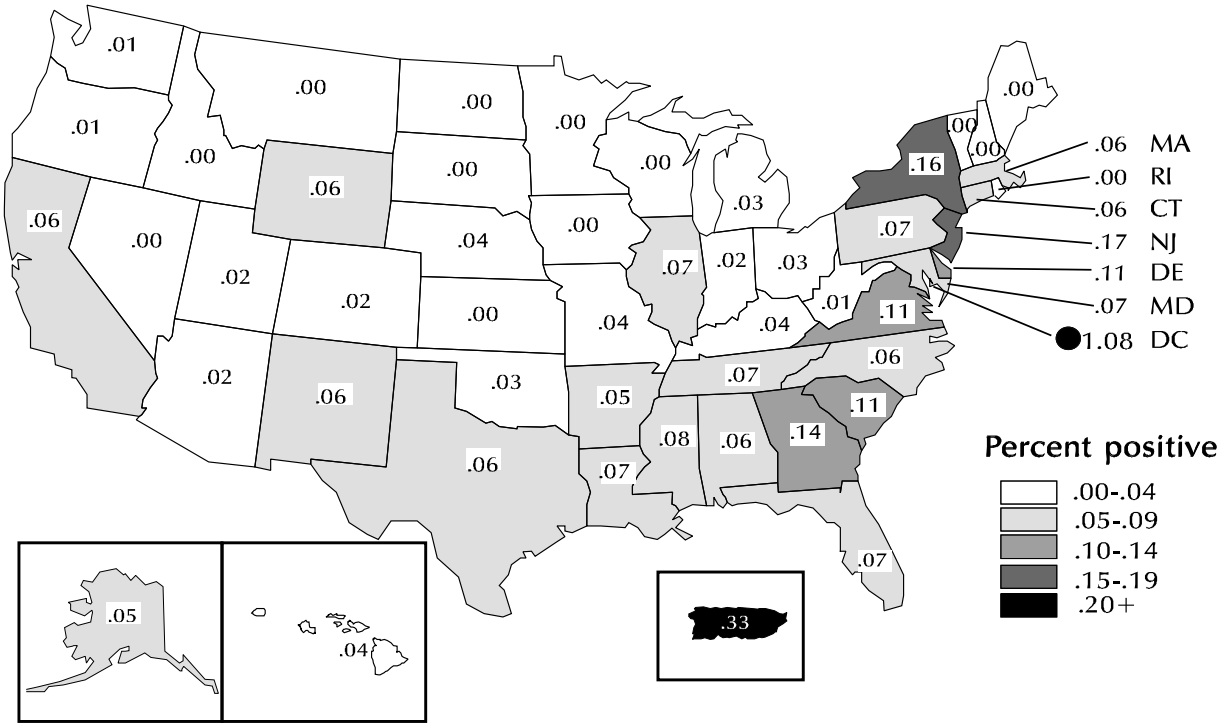
Source: Department of Defense

Figure 7. HIV seroprevalence among civilian applicants for military service by sex and race/ethnicity, United States, January 1991 through December 1992



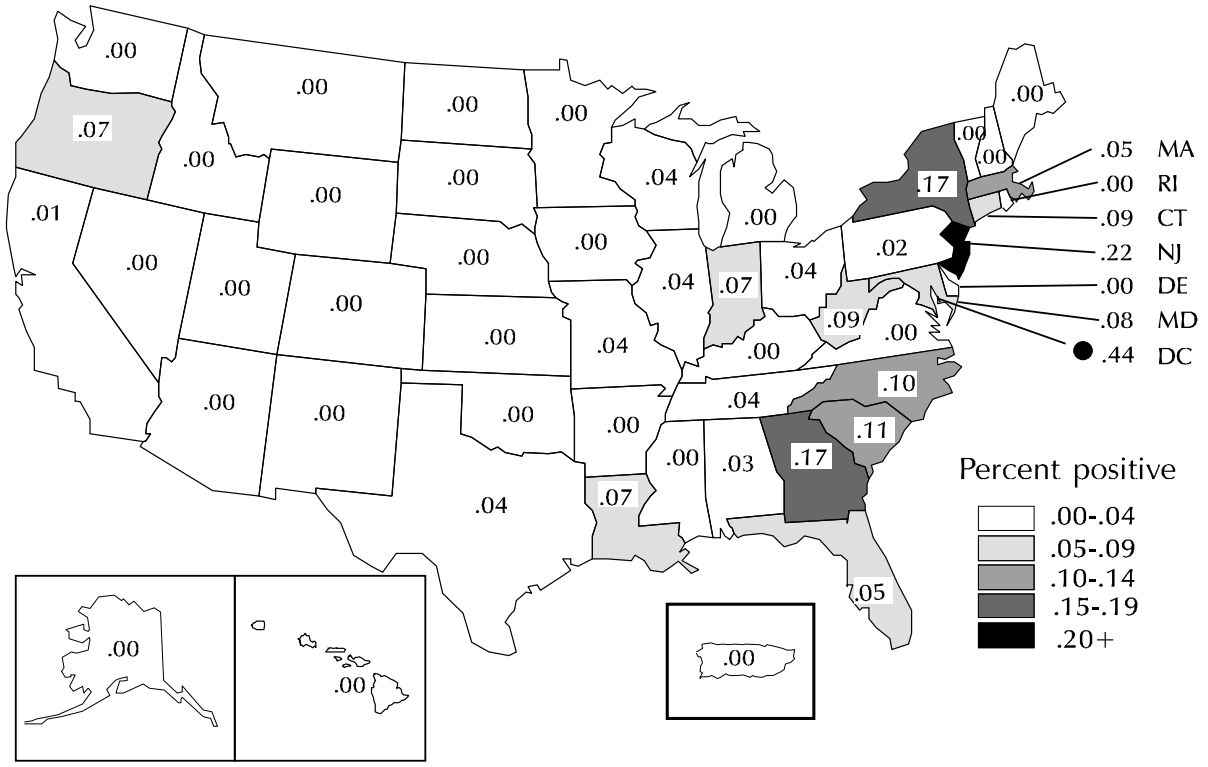
Source: Department of Defense

Figure 8. HIV seroprevalence among male applicants for military service by state of residence, United States, January 1991 through December 1992



Source: Department of Defense

Figure 9. HIV seroprevalence among female applicants for military service by state of residence, United States, January 1991 through December 1992



Source: Department of Defense

Surveys of Women

Survey in Childbearing Women

A survey to estimate prevalence of HIV infection among childbearing women is conducted in 44 states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands (Figure 1) in collaboration with CDC, the National Institute of Child Health and Human Development, and state and territorial health departments. The survey, initiated in most states in 1988-89, is based on the systematic, unlinked testing for HIV antibody of residual blood specimens routinely collected on filter paper from newborn infants for metabolic screening. Consecutive births during a survey period of at least 3 months per year are sampled in each state. A positive test reflects HIV infection in the mother, but not necessarily in the infant, because maternal antibodies cross the placenta during pregnancy.

Between January 1988 and December 1992, 9 million unlinked specimens, representing nearly one half of all live births during that period, were tested for maternal HIV antibody in state public health laboratories. The weighted seroprevalence estimate for childbearing women nationwide was 0.17% in 1991-1992, corresponding to nearly 7,000 births to HIV-infected women each year. Overall, the seroprevalence increased slightly from 0.16% in 1989-1990. In the 38 states that collected data during 1989-1990 and 1991-1992, the seroprevalence increased in 19 states, decreased five states, and was relatively unchanged in 14 states (Figure 10). Prevalence changed regionally from 1989-1990 to 1991-1992, increasing from 0.17% to 0.21% in the South and decreasing from 0.41% to 0.36% in the Northeast.

Seroprevalence was highest among black women. Rates were three to 28 times higher among black women than white women in the 21 states with

Figure 10. HIV seroprevalence change from 1989-1990 to 1991-1992 among childbearing women in 38 states (*each line represents a state*)

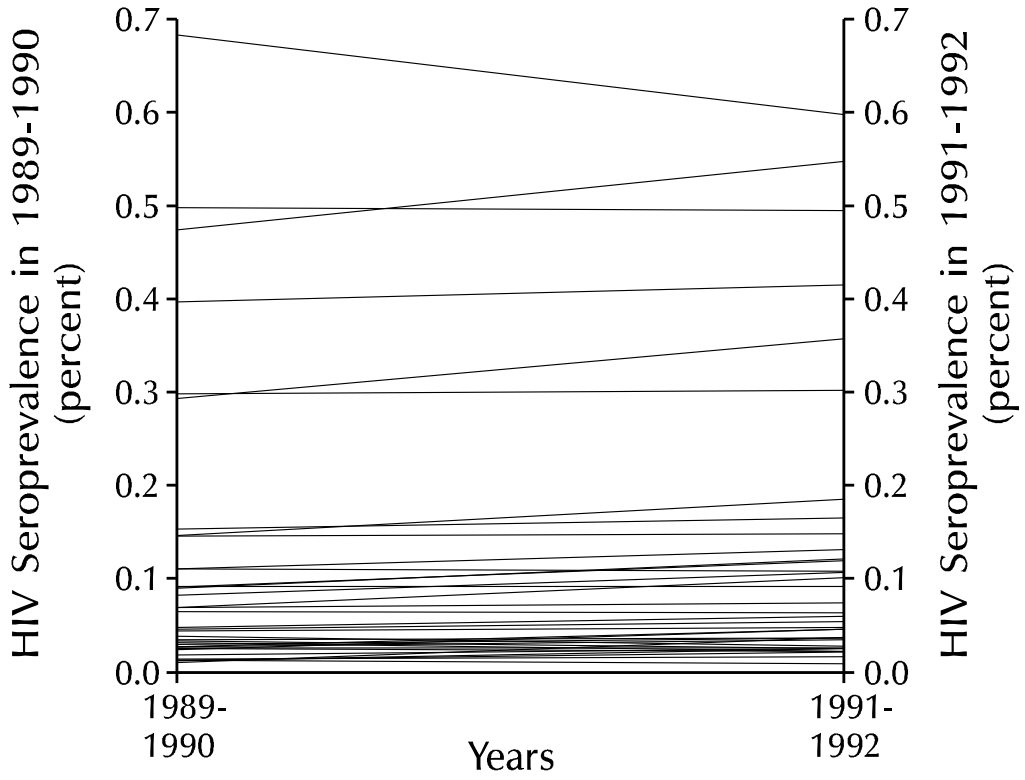
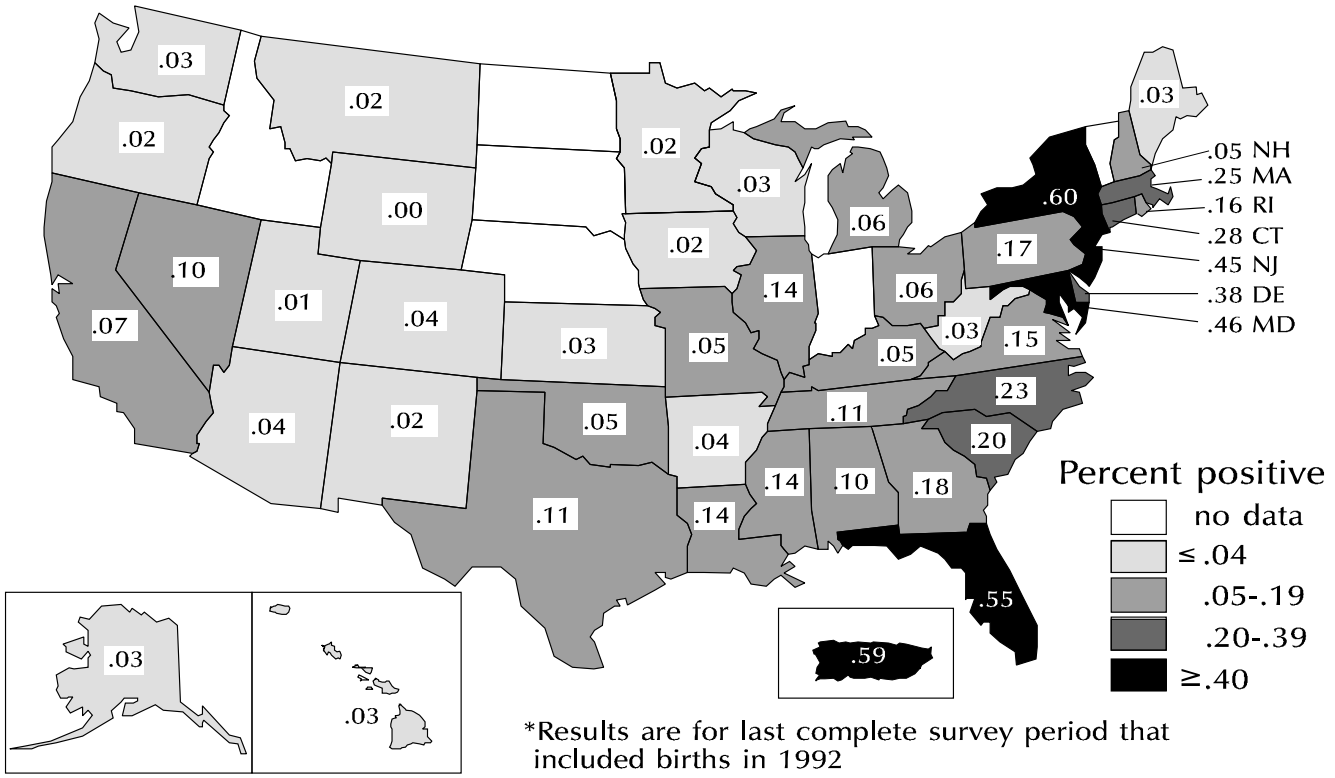


Figure 11. HIV seroprevalence among childbearing women, United States, 1991 through 1992*



sufficient race/ethnicity data available for analysis during the 1992 survey period. These 21 states accounted for nearly 75% of all HIV-infected childbearing women in the United States. In these states, 63% of the HIV seropositive women were black. In five states, the seroprevalence among black women exceeded 1%.

State-specific seroprevalence rates ranged from 0.0% to 0.60% for 1991-92 (Figure 11). The highest prevalence rates were found in states along the Atlantic Coast. The HIV pattern among childbearing women is geographically consistent with that among injecting drug users (Tables 3 and 5, Figure 12). In general, prevalences were highest among women from large metropolitan areas. However, infected childbearing women were detected in all but one of the states surveyed and in both urban and rural areas, particularly in the South. Results from the survey support the need for targeted prevention efforts and for HIV counseling and testing among women of childbearing age.

Women's Reproductive Health Clinics

To help determine the extent of HIV infection among U.S. women of reproductive age, in 1987 CDC developed a standardized protocol for conducting seroprevalence surveys in women's reproductive health clinics. In 1991 and 1992, unlinked surveys were supported in 163 such clinics. These sites included family planning, prenatal, and abortion clinics in 39 metropolitan areas. Women seeking services at these clinics were included in the survey on their initial visit during the survey period. Women whose only reason for the clinic visit was an HIV test were not included. The target sample size was 1,000 per clinic.

During 1991 and 1992, 254,828 serum samples were tested for HIV. Data were analyzed for this report for the 144 clinics that had submitted at least 200 specimens during this period (Table 2). Among these clinics, the median sero-

Table 2. Summary of HIV seroprevalence data from women's reproductive health clinics[1] by metropolitan area, 1991-1992

Geographic division/ metropolitan area	Total clinics[1]	Total specimens tested[2]	Clinics analyzed[3]	Percent positive[4] Median	(Range)
New England					
Maine[5]	-	-	-	-	-
Boston, Mass.	3	4,133	3	2.3	(1.9-3.3)
New Bedford, Mass.[5]	-	-	-	-	-
New Haven, Conn.	3	4,180	3	0.8	(0.7-1.1)
Providence, R.I.[5]	-	-	-	-	-
Springfield, Mass.[5]	-	-	-	-	-
Middle Atlantic					
Buffalo, N.Y.[5]	-	-	-	-	-
New York, N.Y.	11	11,383	10	0.8	(0.0-2.3)
Newark, N.J.	6	12,358	6	0.4	(0.2-1.4)
Philadelphia, Pa.	3	3,895	3	0.2	(0.0-0.5)
Rochester, N.Y.	4	3,736	4	0.2	(0.0-0.3)
East North Central					
Charleston, W.V.	1	2,138	1	0.0	-
Chicago, Ill.	8	10,967	6	0.1	(0.0-0.2)
Cleveland, Ohio	3	6,584	3	0.2	(0.2-0.3)
Detroit, Mich.	5	6,026	5	0.0	(0.0-0.6)
Indianapolis, Ind.	1	21	0	-	-
Milwaukee, Wis.	1	1,114	1	0.0	-
West North Central					
Kansas City, Mo.	3	7,522	3	0.0	(0.0-0.0)
Minneapolis, Minn.	3	6,939	3	0.1	(0.0-0.1)
Saint Louis, Mo.	5	2,289	3	0.2	(0.0-0.2)
South Atlantic					
Atlanta, Ga.	2	1,555	2	0.7	(0.2-1.1)
Baltimore, Md.	5	12,647	5	0.5	(0.0-1.5)
Jacksonville, Fla.	3	8,396	3	0.3	(0.2-1.2)
Miami, Fla.	2	5,460	2	1.3	(0.9-1.7)
Richmond, Va.	6	9,585	5	0.5	(0.4-1.7)
Washington, D.C.	7	13,429	6	0.7	(0.3-2.3)
Wilmington, Del.	4	4,091	2	0.2	(0.0-0.4)
East South Central					
Birmingham, Ala.	4	8,348	4	0.2	(0.1-0.4)
Memphis, Tenn.	2	4,048	2	0.2	(0.1-0.3)
West South Central					
Dallas, Tex.	6	12,204	6	0.0	(0.0-0.2)
Houston, Tex.	10	11,460	5	0.2	(0.0-0.5)
Little Rock, Ark.	2	3,738	2	0.0	(0.0-0.0)
New Orleans, La.	2	3,603	2	0.1	(0.0-0.1)
Oklahoma City, Okla.[5]	-	-	-	-	-
San Antonio, Tex.	3	3,129	3	0.1	(0.0-0.1)
Mountain					
Albuquerque, N.M.	2	3,309	2	0.1	(0.1-0.2)
Denver, Colo.	3	4,562	3	0.2	(0.0-0.3)
Las Vegas, Nev.[5]	-	-	-	-	-
Phoenix, Ariz.	6	7,282	6	0.1	(0.0-0.2)
Salt Lake City, Utah	1	3,706	1	0.1	-
Pacific					
Honolulu, Hawaii	2	1,952	2	0.0	(0.0-0.0)
Los Angeles, Calif.	7	24,179	7	0.1	(0.0-0.2)
Portland, Oreg.	10	6,556	9	0.1	(0.0-0.2)
San Francisco, Calif.	8	14,095	8	0.1	(0.0-1.1)
Seattle, Wash.	1	709	1	0.6	-
Other					
San Juan, P.R.	5	3,500	2	1.2	(0.9-1.5)
Total	163	254,828	144	0.2	(0.0-3.3)

1 Includes all clinics funded to conduct surveys in 1991 and 1992.
2 Includes all specimens tested in 1991 and 1992.
3 Includes only clinics reporting at least 200 eligible specimens collected and tested according to CDC protocol.
4 The median rate for clinics in the metropolitan area; range is the lowest and highest rates of clinics in the metropolitan area.
5 No unlinked survey funded.

prevalence was 0.2% (1 sample positive for every 500 women tested). Seroprevalence rates ranged from 0% in 33 clinics to over 1% in 18 clinics. Seroprevalence varied geographically, with the highest rates found in clinics in the Atlantic Coast area and in Puerto Rico. Women 25-29 years of age generally had the highest rates of HIV infection. For population subgroups from which at least 50 specimens were tested per clinic, seroprevalence was generally highest among black women, who had a median clinic-specific seroprevalence of 0.4% (range 0.0%-8.2%). This rate compared with a median of 0.0% among both white women (range 0.0%-8.2%) and Hispanic women (range 0.0%-1.5%).

Analysis of the 127 clinics, each with results from at least 200 women, indicated little or no change in prevalence from 1989-1990 to 1991-1992. The median clinic seroprevalence was 0.2% during both time periods.

Surveys of Adults at High Risk for Acquiring HIV

Drug Treatment Centers

Because injecting drug use plays a key role in transmitting HIV infection, CDC established methodology in 1987 for conducting seroprevalence surveys in drug treatment centers. Persons who enter participating drug treatment centers and who report injecting illicit drugs during the previous year are included in the surveys. During 1991 and 1992, surveys were supported in 114 centers in 40 cities; 43,528 serum samples were collected and tested. Data presented in this summary are from surveys in 35 metropolitan areas of injecting drug users (IDUs) in the 78 treatment programs that submitted at least 100 blood specimens in 1991-1992. Over half of the drug treatment centers offered methadone maintenance or methadone detoxification; programs at other centers included drug-free treatment, cocaine treatment, or therapeutic community programs.

HIV seroprevalence among IDUs ranged by center from 0.6% to 52.9% (median 7.5%) (Table 3). Seroprevalence varied greatly by geographic location, with the highest observed rates in the Atlantic Coast area (Figure 12). The median prevalence was 7.8% (range 0.0%-41.2%) among men and 6.3% (range 0.0%-38.6%) among women. Seroprevalence rates among men and women at each center were generally similar.

HIV seroprevalence by center was substantially higher among blacks than among whites in all geographic regions. The median seroprevalence rates for whites and blacks were 3.8% and 18.4%, respectively. HIV seroprevalence was higher among blacks in 50 of the 56 clinics that collected data from both whites and blacks. HIV seroprevalence was generally higher among Hispanics (median 5.7%) than among whites (median 3.8%); however, this difference was largely due to

Figure 12. HIV seroprevalence among injecting drug users, drug treatment center surveys, 1991 through 1992

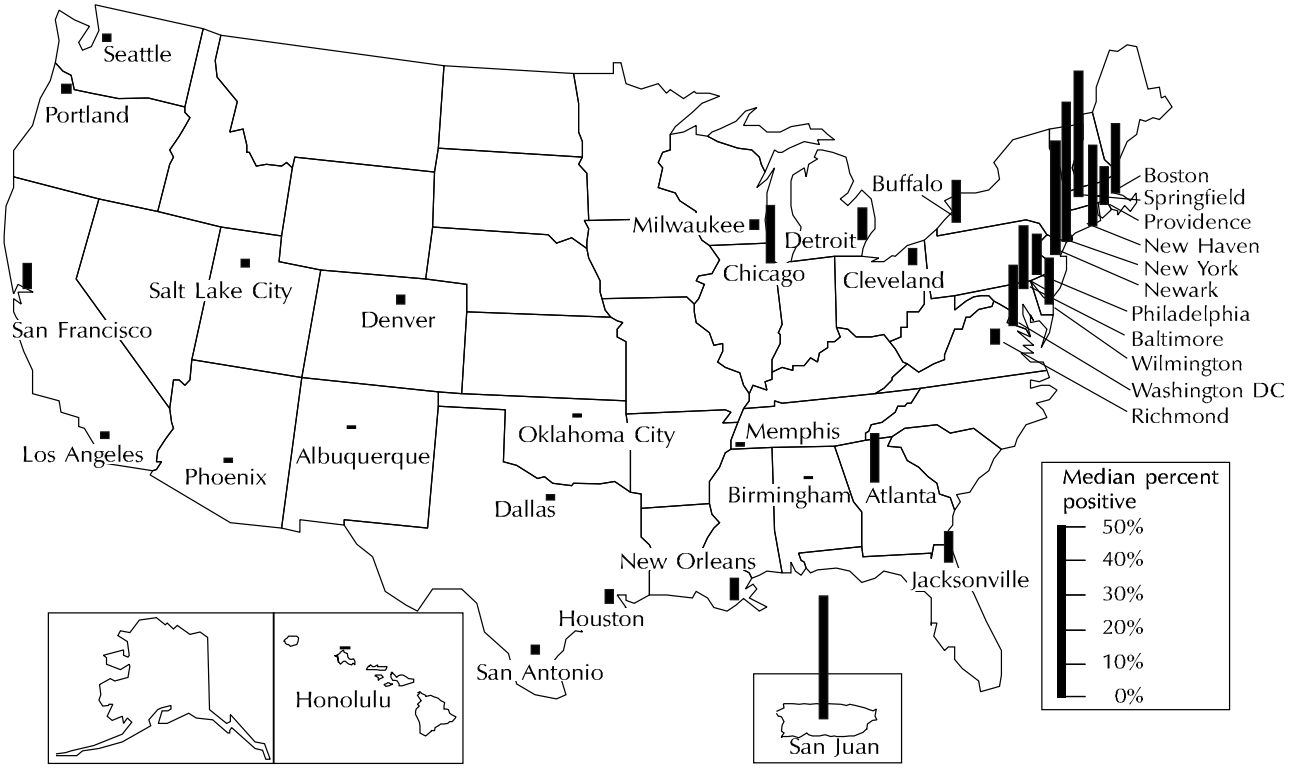


Table 3. Summary of HIV seroprevalence data from injecting drug users entering drug treatment centers [1] by metropolitan area and sex, 1991-1992

Geographic division/ metropolitan area	Total centers[1]	Total specimens tested[2]	Centers analyzed[3]	Median percent positive[3-5]		All centers[3] percent positive	
				Male	Female	Median[5]	(Range)[6]
New England							
Maine[7]	-	-	-	-	-	-	-
Boston, Mass.	3	638	2	22.1	18.0	20.5	(17.3-23.6)
New Bedford, Mass.[7]	-	-	-	-	-	-	-
New Haven, Conn.	1	421	1	22.9	26.4	23.7	-
Providence, R.I.	3	394	1	12.2	8.9	11.3	-
Springfield, Mass.	1	215	1	41.5	30.7	36.7	-
Middle Atlantic							
Buffalo, N.Y.	4	748	4	12.3	10.8	12.5	(9.3-19.9)
New York, N.Y.	7	4,755	4	41.2	38.6	40.4	(26.2-52.9)
New Jersey[8]	7	2,862	7	34.3	30.0	33.2	(20.3-49.1)
Philadelphia, PA.	5	431	2	13.6	5.4	12.1	(5.3-18.9)
Rochester, N.Y.[7]	-	-	-	-	-	-	-
East North Central							
Charleston, W.V.[7]	-	-	-	-	-	-	-
Chicago, Ill.	1	1,828	1	18.0	14.6	16.9	-
Cleveland, Ohio	2	489	2	6.1	3.1	5.0	(2.8-7.3)
Detroit, Mich.	1	607	1	8.3	11.9	9.4	-
Indianapolis, Ind.	2	88	-	-	-	-	-
Milwaukee, Wis.	2	278	1	4.3	2.1	3.3	-
West North Central							
Kansas City, Mo.	2	18	-	-	-	-	-
Minneapolis, Minn.	2	62	-	-	-	-	-
Saint Louis, Mo.	1	67	-	-	-	-	-
South Atlantic							
Atlanta, Ga.	2	566	2	15.1	12.8	14.5	(7.1-21.8)
Baltimore, Md.	4	1,523	4	18.0	20.2	18.4	(16.7-27.4)
Jacksonville, Fla.	2	171	1	8.9	10.0	9.2	-
Miami, Fla.	3	183	-	-	-	-	-
Richmond, Va.	3	346	2	5.6	2.6	4.9	(1.9-7.8)
Washington, D.C.	1	1,915	1	16.7	19.9	17.6	-
Wilmington, Del.	2	721	2	10.4	18.9	13.6	(12.0-15.3)
East South Central							
Birmingham, Ala.	3	338	1	1.2	0.0	0.8	-
Memphis, Tenn.	2	332	1	0.6	2.4	1.2	-
West South Central							
Dallas, Tex.	1	389	1	2.5	0.9	1.9	-
Houston, Tex.	5	493	2	3.9	4.6	4.0	(2.4-5.7)
Little Rock, Ark.[7]	-	-	-	-	-	-	-
New Orleans, La.	3	218	1	5.2	10.3	6.6	-
Oklahoma City, Okla.	1	422	1	1.4	0.0	1.1	-
San Antonio, Tex.	1	255	1	3.6	0.0	2.9	-
Mountain							
Albuquerque, N.M.	1	345	1	1.2	0.0	0.9	-
Denver, Colo.	5	1,159	4	3.3	1.6	2.8	(1.6-3.4)
Las Vegas, Nev.[7]	-	-	-	-	-	-	-
Phoenix, Ariz.	2	541	1	1.8	1.2	1.6	-
Salt Lake City, Utah	1	249	1	2.5	2.4	2.4	-
Pacific							
Honolulu, Hawaii	1	135	1	0.0	2.7	0.7	-
Los Angeles, Calif.	5	4,414	5	2.3	1.3	2.0	(0.6-3.8)
Portland, Oreg.	4	579	1	3.4	0.0	2.7	-
San Francisco, Calif.	10	9,128	10	7.5	5.8	7.5	(3.5-15.4)
Seattle, Wash.	7	2,887	6	2.3	2.2	2.4	(1.4-3.8)
Other							
San Juan, P.R.	1	2,318	1	32.2	35.7	32.7	-
Total	114	43,528	78	7.8	6.3	7.5	(0.6-52.9)

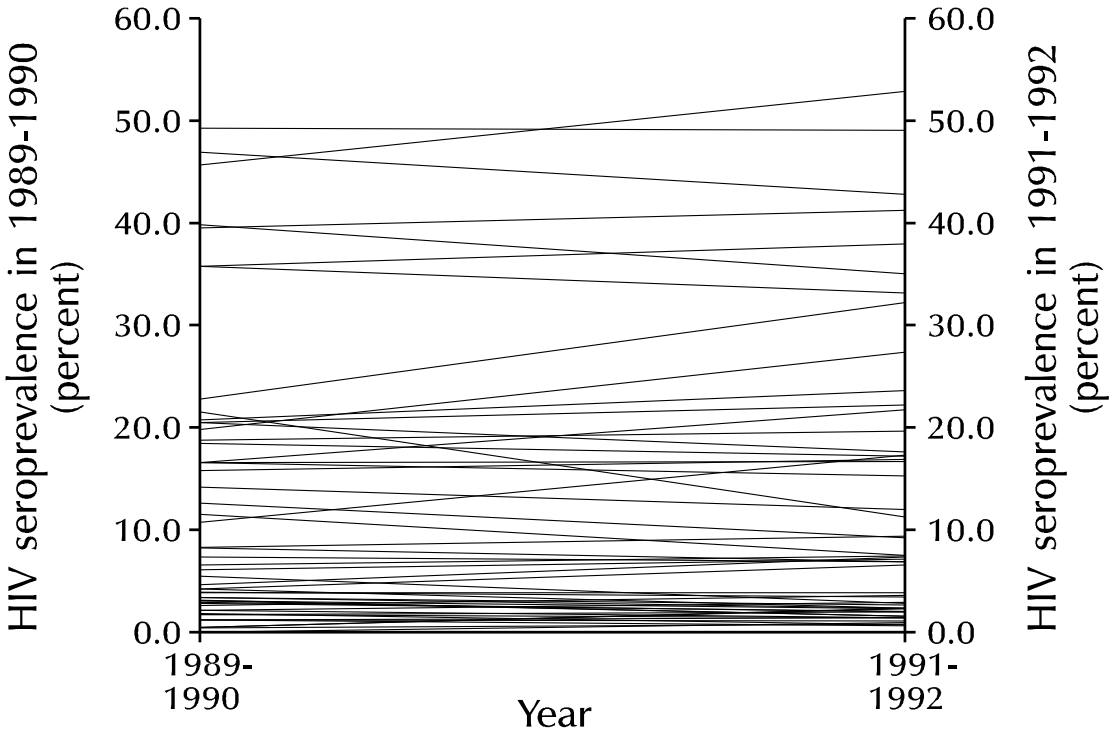
1 Includes centers funded to conduct unlinked surveys in 1991 and 1992.
2 Includes all specimens tested in 1991 and 1992.
3 Includes only centers reporting at least 100 eligible specimens collected and tested according to CDC protocol.
4 Subgroups analyzed for centers reporting at least 25 specimens per group.
5 The median rate for centers in the metropolitan area.
6 Range is the lowest and highest rates of centers in the metropolitan area.
7 No unlinked survey funded.
8 New Jersey consists of 2 centers in Newark and 5 in other cities within the state.

higher rates among Hispanics in the Northeast. In the Northeast, the seroprevalence was higher among Hispanics in 10 of the 12 clinics with data from both whites and Hispanics, whereas only half of 28 clinics in the rest of the country had higher rates among Hispanics.

Data are available from 54 treatment centers that each surveyed at least 100 IDUs in 1989-1990 and 1991-1992. There was no consistent change in seroprevalence by race/ethnicity, within geographic regions, or overall. The median seroprevalence for these 54 clinics was 7.0% in 1991-1992; the absolute clinic seroprevalence decreased a median of 0.1% from 1989-1990, with seroprevalence decreasing in 28 clinics and increasing in 26 (Figure 13). Race/ethnicity data were analyzed for clinics that tested at least 25 persons in each group during each period. A total of 52 clinics sampled at least 25 whites, 37 clinics sampled at least 25 blacks, and 27 clinics sampled at least 25 Hispanics. For these clinics, the median seroprevalence rates in 1991-1992 among whites, blacks, and Hispanics were 3.4%, 19.9%, and 5.7%, respectively. Corresponding median absolute changes in seroprevalence rates from 1989-1990 to 1991-1992 were -0.2%, +0.3%, and +0.4% respectively, with approximately equal numbers of clinics increasing and decreasing in seroprevalence between these two periods.

Considerable worldwide experience indicates that once HIV is introduced into a population of injection drug users, HIV seroprevalence increases rapidly and then stabilizes. The U.S. serosurveillance data indicate that HIV seroprevalence has stabilized in most U.S. cities; however, marked geographic variations remain. These data suggest that HIV seroprevalence increased rapidly before 1987 and reached a different plateau in each city, with cities in states along the

Figure 13. HIV seroprevalence change from 1989-1990 to 1991-1992 among injecting drug users entering treatment centers (each line represents a clinic)



Atlantic Coast and in Puerto Rico having higher seroprevalence than those in the Midwest and along the Pacific Coast. Why such large geographic variations in seroprevalence persist remains unknown.

Correctional Facilities

Because some prison inmates are at high risk for HIV infection, primarily because of injecting drug use, CDC began collaborating with selected states and metropolitan areas in 1989 to conduct HIV seroprevalence surveys in correctional facilities. During 1991-1992, over 70,000 samples were collected at 35 sites in 17 metropolitan areas. Since different correctional facilities serve different types of inmates, often based on offense committed or security level required, surveys were conducted in various state, county, and local facilities to provide a more complete view of the inmate population. To participate in the surveys, facilities had to be collecting blood samples for routine medical purposes from all new inmates and have the capacity to conduct annual HIV surveys according to standardized protocols. Inmates were eligible for inclusion in the surveys upon admission if they had not been previously incarcerated in the same facility during the survey period.

The overall median seroprevalence was 2.9%, with a range of 0.0%-14.9% (Table 4). Prevalence rates were generally similar or higher among female than among male inmates in the same cities. The highest prevalence (24%) was found among female inmates in New York City. Seroprevalence rates were highest for cities in states along the Atlantic Coast, with lower levels for cities in the Midwest and along the Pacific Coast. This geographic pattern is similar to that observed among injecting drug users entering treatment (Table 3, Figure 12).

These high prevalence rates indicate the need for HIV prevention services and care in correctional facilities. These data also indicate that correctional facilities where behavioral information can be obtained from entering inmates may be good sentinel sites for monitoring HIV seroprevalence among injecting drug users who are not in treatment.

Clinics for Homeless Adults

Homeless populations are at increased risk for HIV infection because of a high prevalence of behaviors associated with HIV transmission. Through 1992, participating survey sites were primarily health clinics serving persons or families lacking a fixed and adequate nighttime residence. Clients were eligible for inclusion in the survey if their initial clinic visit occurred during the survey period. Clients attending the clinics for follow-up visits or primarily for HIV testing, evaluation, or treatment were excluded. Data from 10 cities at 10 sites that collected at least 50 specimens from persons at least 25 years of age are reported here. Clinics were located in states in the Southeast, Midwest, and West. No clinics in the Northeast were surveyed.

During 1991 and 1992, 8,674 serum samples were tested. The median clinic seroprevalence was 3.2% (range 1.1%-21%). Seroprevalence was higher among men (median 3.7%, range 1.2%-23.3%) than among women (median 2.1%, range 0.0%-14.5%). Although the median seroprevalence was higher among blacks (median, 3.2%, range 1.3%-26.3%) than among whites (median 2.9%, range 0.3%-9.6%), blacks had a lower seroprevalence than whites in three of the 10 clinics. In the four clinics that tested more than 50 specimens from Hispanics, seroprevalence was similar to that among whites.

HIV risk behavior information was gathered at nine of the 10 clinics. Although the prevalence of certain risk behaviors, such as male homosexual contact and injecting drug use, was probably underestimated, the prevalence of recorded HIV risks was high. From 6% to 36% (median 26%) of male clients at the nine clinics had a recorded history of sex with men or injecting

Table 4. Summary of HIV seroprevalence data from persons entering adult correctional facilities by metropolitan area and sex, January 1991 - December 1992

Geographic division/ metropolitan area	Total specimens tested	Centers analyzed[1]	Median percent positive		All centers[2] percent positive	
			Male	Female	Median	(Range)
New England						
Massachusetts[3]	10,227	5	6.3	14.1	7.3	(3.6 - 14.1)
Middle Atlantic						
New York, N.Y.	5,145	1	12.5	24.0	14.9	-
Newark, N.J.	4,566	3	6.0	14.1	8.5	(3.5 - 14.1)
Philadelphia, Pa.	3,735	2	5.9	7.4	6.5	(5.8 - 7.3)
East North Central						
Chicago, Ill.	3,879	2	3.8	5.1	4.5	(3.8 - 5.1)
West North Central						
Saint Louis, Mo.	1,297	2	0.9	0.0	0.7	(0.7 - 0.8)
South Atlantic						
Baltimore, Md.	3,808	1	10.7	11.4	10.8	-
Tampa, Fla.	4,585	1	4.4	6.5	4.7	-
Washington, D.C.	3,792	1	9.8	9.8	9.9	-
East South Central						
Birmingham, Ala.	2,286	1	2.1	2.2	2.1	-
Memphis, Tenn.	8,052	5	1.2	1.3	1.3	(0.0 - 0.2)
West South Central						
Little Rock, Ark.	3,822	2	0.6	1.0	0.8	(0.6 - 1.0)
New Orleans, La.	3,104	2	2.6	-	2.6	(2.2 - 2.9)
Texas[3]	6,574	2	0.9	2.1	2.7	(1.6 - 3.8)
Pacific						
Oregon[3]	3,464	2	0.7	1.1	0.9	(0.7 - 1.1)
San Francisco, Calif.	959	1	2.4	-	2.4	-
Washington[3]	1,460	2	0.7	1.8	1.4	(0.9 - 1.9)
Total	70,755	35	2.3	5.1	2.9	(0.0 - 14.9)

1 Includes only correctional facilities reporting at least 25 eligible specimens collected and tested according to CDC protocol.
2 The median rate for all correctional facilities in the metropolitan area; range is the lowest and highest rates of correctional facilities in the metropolitan area.
3 State correctional facilities.

drug use. Overall, these persons contributed 23% of all specimens but accounted for 44% of all HIV infections among men. Among women, 3% to 17% (median 8%) were injecting drug users and 0% to 14% (median 6%) had heterosexual contact with someone known to be at high risk for HIV. Overall, these women contributed 18% of all specimens and accounted for 35% of the HIV infections among women. Nearly all of the other women had had heterosexual contact with persons of unknown HIV risk.

These data indicate that homeless men and women are at high risk for HIV infection. A high proportion of homeless men are likely infected through sex with men and injecting drug use. Injecting drug use and sex contact with a person known to be at high risk for HIV accounted for one third of the HIV infections among women; however, two thirds of the seropositive women had as their only risk behavior heterosexual contact with someone at unknown risk for HIV.

Sexually Transmitted Disease (STD) Clinics

In 1987, CDC established methods and protocols for serosurveillance of HIV infection in STD clinics because they serve persons at increased risk of infection due to unpro-

tected sex and other behaviors such as injecting drug use. During 1991 and 1992, STD clinics in 46 metropolitan areas conducted unlinked surveys. Serum samples from clients who were being evaluated for a possible STD and who had not visited the clinic in the previous 3 months were included in the survey. Clients attending the clinic for follow-up visits, solely for HIV testing, or for evaluation of HIV infection were excluded. Eligible specimens were selected consecutively to meet a sample size of at least 500 women at each clinic; the number of men usually exceeded 500 since men outnumber women at most STD clinics. The annual survey period ranged from 6 weeks to 1 year, depending on the clinic size; generally 1,000-2,000 samples were tested per clinic per year. In all, 348,758 serum samples were tested during 1991 and 1992 (Table 5).

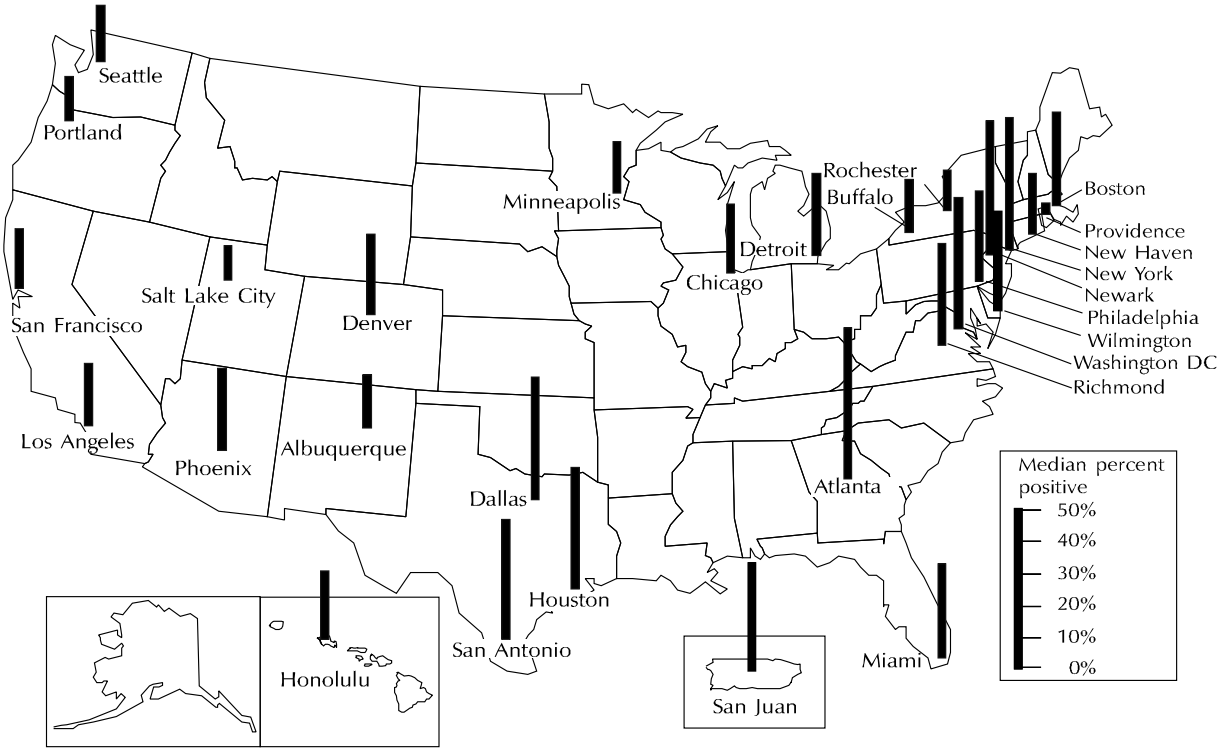
This report summarizes results for 1991-1992 from the 112 STD clinics in 46 metropolitan areas that submitted at least 500 serum specimens each. Nationally, the median seroprevalence at the clinics was 1.6%, with a range of 0.1%-25.1%. Seroprevalence was highest among men who reported sex with men (median 25.5%; range 3.9%-47.4%) and among heterosexual persons of both sexes who injected drugs (median for men 7.1%, range 0.0%-34.4%; median for females 4.5%, range 0.0%-27.4%) (Table 5). Among clients who reported no male homosexual contact or injecting drug use, the median seroprevalence was higher for men (0.9%) than for women (0.6%). However, because completeness of risk ascertainment varied among clinics, risk behaviors may be underreported for some clinics, resulting in probable overestimates of HIV prevalence among clients reporting no male homosexual contact or injecting drug use.

HIV seroprevalence rates varied by area of the country and by risk behavior (Table 5). While HIV prevalence among men reporting sexual activity with men was high in all areas, it was the highest in states along the Atlantic Coast, Texas, and Puerto Rico (Figure 14). Among female and heterosexual male injecting drug users and among persons who denied male homosexual contact and injecting drug use, rates were generally highest in the Atlantic Coast states, including Florida, and Puerto Rico and lowest in the Mountain and Pacific Coast states (Table 5).

Median seroprevalence rates for black (2.0%) and Hispanic (2.1%) patients were similar and were usually higher than rates among whites (1.5%). When the race/ethnicity data were analyzed for clinics that submitted at least 50 specimens per group, blacks and Hispanics had higher seroprevalence rates than whites among men who had sex with men (median prevalence rates 43.5%, 27.9%, and 18%, respectively), injecting drug users (median prevalence rates 8.5%, 4.4%, 1.7%), and heterosexually active persons who did not report these risks (median prevalence rates 1.2%, 0.9%, 0.4%). However, these differences resulted in part from the geographic distribution of clinics with sufficient numbers of persons within each of these race/ethnicity and HIV risk groups. When persons of different race/ethnicities but with the same HIV behaviors (men who had sex with men, injecting drug use, and heterosexual contact without male homosexual contact or injecting drug use) were sampled from the same clinic, blacks had consistently higher seroprevalence than whites, while the seroprevalence among Hispanics was usually similar to that of whites.

In 1989-1990 and 1991-1992, 42 STD clinics tested at least 50 men who reported sex with men. The median seroprevalence among these men was 27.3% in 1991-1992, with a median 5.7% absolute decrease in HIV seroprevalence from 1989-1990 (Figure 15). Among men who had sex with men, the seroprevalence decreased in 33 clinics and increased in only nine. In 11 STD clinics, at least 50 men under 25 years of age who reported sex with men were tested during both time periods. The median seroprevalence was 11.4% in 1991-1992, with a

Figure 14. HIV seroprevalence among men having sex with men, STD clinic surveys, 1991 through 1992



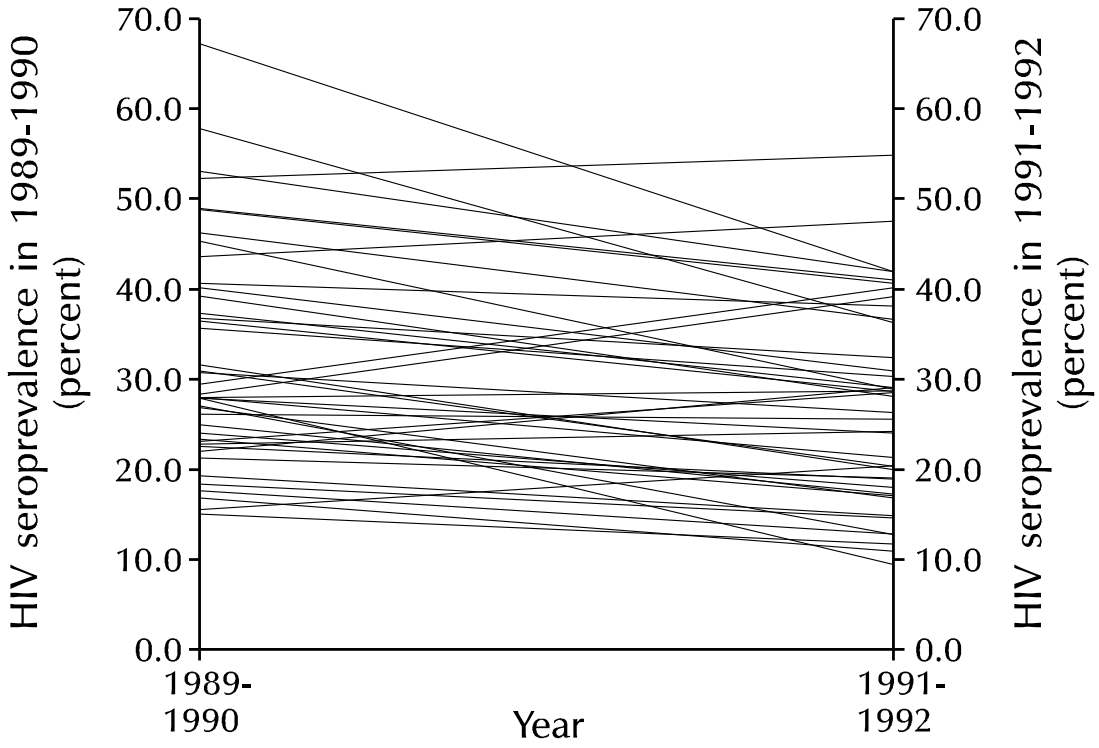
median absolute decrease in prevalence of 5.5%. Seroprevalence decreased in 10 of these 11 clinics.

Among men who had sex with men, the most consistent change was among white men. Of the 18 clinics that tested 50 white men who had sex with men in each of the two time periods, the median clinic seroprevalence was 20.4% in 1991-1992, with a 6.5% median absolute decrease from 1989-1990. Seroprevalence decreased in 15 clinics and increased in three. A less consistent change was observed among the 15 clinics that tested 50 black men who had sex with men in each of the two time periods. The median seroprevalence was 43.5% in 1991-1992, with a median 2.1% absolute decrease from 1989-1990. Seroprevalence decreased in 10 clinics and increased in six. Among Hispanics, 12 clinics tested 50 Hispanic men who had sex with men. The median seroprevalence was 30.6% in 1991-1992, with a median 3.4% absolute decrease. The seroprevalence decreased in eight clinics and increased in three.

Thirty-nine clinics reported at least 50 injecting drug users during 1989-1990 and 1991-1992. The median seroprevalence was 6.4% in 1991-1992, with a median absolute 0.2% decrease from 1989-1990. Seroprevalence increased in 19 clinics and decreased in 20 clinics.

Among heterosexually active females who reported no injecting drug use and heterosexually active males who reported no injecting drug use or male homosexual contact, there was no meaningful change in prevalence and no suggestion of a trend either up or down. Among the 104 clinics that sampled at least 50 heterosexually active persons who did not inject drugs during both time periods, the median prevalence was 1% in 1991-1992, with a median absolute decrease of 0.1% from 1989-1990. The seroprevalence increased in 40 clinics, decreased in 54 clinics, and remained the same in nine clinics.

Figure 15. HIV seroprevalence change in 42 STD clinics from 1989-1990 to 1990-1991 among men having sex with men



STD clinics serve large numbers of HIV-infected persons. HIV surveillance in these clinics provides important information about populations at greatest risk for HIV infection. Serosurveillance may also provide an early warning of the heterosexual spread of HIV infection, since those at greatest risk of heterosexual transmission are likely to be those also at risk of acquiring other STDs. Nevertheless, seroprevalence data among heterosexually active persons who report no male homosexual contact or injecting drug use should be cautiously interpreted. Because the seroprevalence is very high among men who have sex with men and injecting drug users, misclassifying only a few of these persons can elevate the measured seroprevalence among persons reported with heterosexual contact as their only risk.

Table 5. Summary of HIV seroprevalence data from sexually transmitted disease clinics[1] by metropolitan area, exposure category, and sex, 1991-1992

Geographic division/ metropolitan area	Total clinics[1]	Total specimens tested[2]	Clinics analyzed[3]	Median percent positive [3-5]					All clinics[3] percent positive	
				Men who have had sex with men since 1978	Heterosexuals who have injected illicit drugs since 1978		No acknowledged risk			
					Male	Female	Male	Female	Median[5]	(Range)[6]
New England										
Maine	3	2,599	3	-	-	-	0.0	0.0	0.9	(0.2-0.9)
Boston, Mass.	3	8,543	3	29.5	7.1	-	1.3	0.4	1.6	(1.4-3.5)
New Bedford, Mass.	2	1,591	1	-	11.3	24.0	0.9	1.9	2.8	-
New Haven, Conn.	1	3,964	1	19.2	25.6	-	2.2	3.1	3.4	-
Providence, R.I.	1	3,078	1	3.9	-	-	0.3	0.4	0.7	-
Springfield, Mass.	1	2,094	1	-	-	-	1.6	1.5	2.4	-
Middle Atlantic										
Buffalo, N.Y.	1	2,729	1	17.0	-	-	0.8	0.9	1.2	-
New York, N.Y.	12	32,779	9	41.4	34.4	27.4	6.7	5.2	7.5	(4.9-11.5)
Newark, N.J.	2	6,119	2	42.0	-	-	4.8	6.6	6.9	(5.5-8.2)
Philadelphia, Pa.	1	5,089	1	28.6	9.8	5.7	3.9	2.6	4.4	-
Rochester, N.Y.	2	5,937	2	12.9	-	-	0.9	1.6	1.6	(1.3-2.0)
East North Central										
Charleston, W.V.	2	3,425	2	-	-	-	0.2	0.0	0.5	(0.4-0.6)
Chicago, Ill.	7	19,887	7	21.7	5.1	-	1.2	0.4	1.0	(0.2-9.5)
Cleveland, Ohio	2	4,687	2	-	0.0	-	1.2	0.5	1.6	(1.0-2.1)
Detroit, Mich.	7	20,234	7	25.9	-	-	0.2	0.1	0.6	(0.1-1.9)
Indianapolis, Ind.	1	1,475	1	-	-	-	0.6	0.2	1.2	-
Milwaukee, Wis.	2	3,193	1	-	-	-	0.9	0.5	1.2	-
West North Central										
Kansas City, Mo.	2	5,356	2	-	-	-	0.3	0.3	0.8	(0.5-1.1)
Minneapolis, Minn.	2	5,597	2	16.6	-	-	0.4	0.1	1.0	(0.8-1.1)
Saint Louis, Mo.	2	2,449	2	-	-	-	0.6	0.0	0.7	(0.5-0.8)
South Atlantic										
Atlanta, Ga.	3	8,601	3	47.4	23.9	-	2.0	0.5	2.2	(1.2-5.0)
Baltimore, Md.	3	6,941	2	-	15.1	15.6	2.6	1.7	5.1	(5.1-5.2)
Jacksonville, Fla.	1	2,745	1	-	-	-	3.5	2.3	3.9	-
Miami, Fla.	4	11,954	4	29.7	-	-	6.5	5.8	9.3	(5.9-10.8)
Richmond, Va.	1	2,753	1	32.1	3.8	-	1.2	0.6	2.0	-
Washington, D.C.	3	13,939	3	41.5	14.6	26.4	5.1	4.4	6.3	(6.0-25.1)
Wilmington, Del.	3	6,612	3	-	18.1	20.4	0.5	1.2	0.9	(0.7-3.6)
East South Central										
Birmingham, Ala.	1	6,802	1	-	-	-	0.8	0.5	1.0	-
Memphis, Tenn.	1	3,484	1	-	-	-	1.5	1.0	2.1	-
West South Central										
Dallas, Tex.	1	2,893	1	38.4	-	-	1.2	0.8	2.1	-
Houston, Tex.	5	12,473	4	38.3	-	-	3.3	2.2	3.6	(2.9-14.2)
Little Rock, Ark.	1	3,876	1	-	-	-	0.7	0.0	0.7	-
New Orleans, La.	2	4,928	2	-	-	-	1.3	1.0	1.6	(1.4-1.8)
Oklahoma City, Okla.	1	3,007	1	-	-	-	0.5	0.3	0.8	-
San Antonio, Tex.	1	3,304	1	37.7	-	-	1.9	0.9	2.3	-
Mountain										
Albuquerque, N.M.	1	2,499	1	16.1	-	-	0.6	0.4	1.2	-
Denver, Colo.	2	8,224	2	25.4	0.5	0.7	0.2	0.4	1.9	(1.2-2.7)
Las Vegas, Nev.	1	2,410	1	-	-	-	1.7	0.4	1.2	-
Phoenix, Ariz.	1	4,971	1	26.0	-	-	0.9	0.3	1.7	-
Salt Lake City, Utah	3	6,468	2	11.1	-	-	0.2	0.0	0.6	(0.2-0.9)
Pacific										
Honolulu, Hawaii	1	6,754	1	21.4	-	0.0	0.9	0.1	2.4	-
Los Angeles, Calif.	8	38,368	8	19.7	4.2	2.5	0.9	0.6	1.2	(0.7-8.9)
Portland, Oreg.	4	7,026	4	14.2	1.8	1.0	0.5	0.0	0.6	(0.1-1.9)
San Francisco, Calif.	8	27,791	8	19.1	6.6	6.0	0.8	0.5	1.7	(0.9-10.0)
Seattle, Wash.	3	7,404	3	18.1	2.2	2.4	0.2	0.1	0.5	(0.3-2.3)
Other										
San Juan, P.R.	1	1,706	1	34.4	-	-	7.6	8.5	10.8	-
Total	120	348,758	112	25.5	7.1	4.5	0.9	0.6	1.6	(0.1-25.1)

1 Includes all clinics funded to conduct surveys in 1991 and 1992.
2 Includes all specimens tested in 1991 and 1992.
3 Includes only clinics reporting at least 500 eligible specimens collected and tested according to CDC protocol.
4 Subgroups analyzed for clinics reporting at least 50 specimens per group.
5 The median rate for clinics in the metropolitan area.
6 Range is the lowest and highest rates of clinics in the metropolitan area.

Surveys in Other Populations

American Indians and Alaska Natives

From mid-1989 through 1992, unlinked HIV serologic surveys were conducted in selected Indian Health Service tribal and urban program facilities. Serum specimens routinely collected for syphilis screening from prenatal care, STD, and drug and alcohol treatment patients were anonymously tested for HIV. Data were analyzed from 37,681 serologic specimens collected from July 1989 through June 1991 from 58 facilities, 40 of which were located in rural areas. HIV was detected in specimens from 12 of the 58 participating sites, and from seven of the nine sites with 1,000 or more specimens.

Among patients being treated for sexually transmitted diseases, the HIV seroprevalence was higher among men (0.15%) than among women (0.05%) and was higher in urban areas (1.32% among men, 0.12% among women) than in rural areas (0.15% among men, 0.05% among women). Among third-trimester prenatal patients, the overall seroprevalence was 0.11%, with higher rates in urban areas (0.15%) than in rural areas (0.08%).

These data indicate that HIV infection is relatively uncommon among American Indians and Alaska Natives. However, HIV was detected in many urban and rural sites. Although most of the survey sites were rural, the overall HIV prevalence among third trimester prenatal patients (0.11%) was two thirds that of all U.S. childbearing women (0.17%). Rates among American Indians/Alaska Natives with sexually transmitted diseases were similar to those among persons of all races/ethnicities attending urban STD clinics in the Western and Mountain states.

Blood Centers

CDC began monitoring data from the routine testing of blood donors in 1985. Approximately 8 million people donate about 13 million units of blood annually in the United States, making blood donors the largest group tested for HIV. HIV prevalence rates among donors are lower than those of the general population because persons at increased risk for HIV infection are actively discouraged from donating.

Since blood donors include relatively few persons at risk from the principal modes of HIV transmission and since a large number of donors are screened, new or emerging patterns of HIV transmission (e.g., heterosexual transmission from persons not at recognized risk, occupational exposure among health-care workers) may be detected by an increase over time in HIV seroprevalence among blood donors. In 1988, CDC, in collaboration with the American National Red Cross and other major blood collection agencies, began systematically evaluating risk patterns of HIV-infected donors through detailed interviews and follow-up.

HIV prevalence trend data from 47 American National Red Cross blood centers, which account for approximately half of the blood collected in the United States, are shown in Figures 16 and 17. The HIV prevalence decreased nearly fourfold, from 0.0223% (1 positive for every 4,500 tested) in late 1985 to 0.0067% (about 1 positive for every 15,000 tested) in the second half of 1992 (Figure 16). This decrease has been due in part to the elimination of seropositive donors from the repeat donor pool (about 80% of donations are given by repeat donors). However, rates in first-time blood donors have also declined (Figure 17). Among first-time donors, HIV prevalence among men decreased from 0.0695% in late 1985 to 0.0367% by late 1992, while among women, seroprevalence decreased from 0.0268% to 0.0152% during the same time (Figure 17).

Blood collection agencies have progressively strengthened their exclusion procedures for potential donors at increased risk of HIV. Simultaneously, as the availability of

Figure 16. HIV seroprevalence among blood donors, by date of donation, United States, November 1985 through December 1992

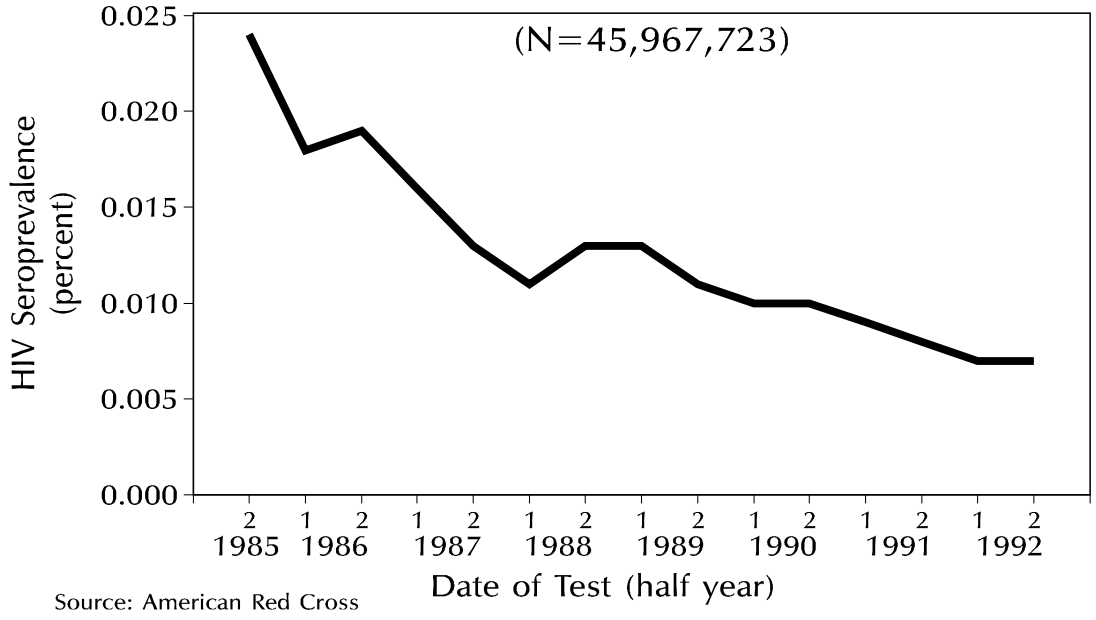
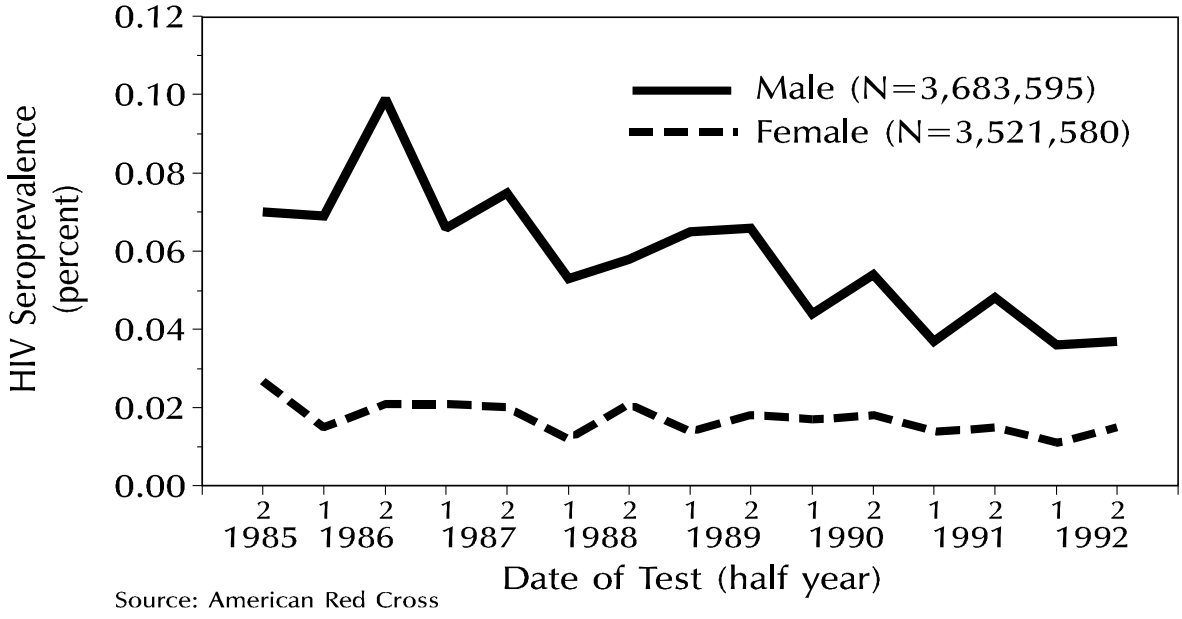


Figure 17. HIV seroprevalence among first-time blood donors, by sex and date of donation, United States, November 1985 through December 1992



HIV counseling and testing has increased, more people at risk have learned their infection status, further reducing the likelihood of infected persons donating blood. Thus, the declining HIV prevalence in blood donors, indicative of increased safety of the blood supply, probably reflects donation exclusion practices and increased knowledge by potential donors of their HIV infection status rather than the underlying HIV infection trends in the population at large.

Primary Care Practices

The ambulatory care patient survey measures antibody to HIV in patients of clinicians who belong to the Ambulatory Sentinel Practice Network (ASPN), which was established to conduct research in primary care medicine. At the beginning of 1991, ASPN comprised 72 practices with 334 clinicians, 90% of whom were family practitioners. ASPN practices are located mostly in rural areas or small towns. Blood specimens remaining from routine diagnostic testing of patients 15-49 years of age were used in the survey.

Data collected from 1990 through 1992 are available from 54 ASPN practices. Of 20,968 specimens with complete demographic data, 99 (0.45%) were positive for HIV. While physicians were asked to record any previous knowledge of a patient's HIV risk factor, no additional risk factor information was obtained from patients specifically for the study. Among all patients in the study, 4% had an HIV risk factor known by the physician, 95% had no risk factor identified, and 2% had no risk factor information recorded. The physicians reported that 1.7% of the male patients had had sex with other men, 0.7% of all patients had injected drugs, 1.3% of all patients had had sex with a person at high risk for HIV, and 0.5% of all patients had received blood transfusions since 1977.

Of the 99 seropositive patients, physicians reported previous knowledge of HIV infection or AIDS in 60 patients; seven others were specifically tested for HIV at the time of the study. Of the remaining 31 persons (one person had incomplete information), 26 had no known risk factors. These data indicate that physicians were not aware of the infection status of approximately one third of HIV-infected patients in the study.

Sentinel Hospitals

The Sentinel Hospital Surveillance System was established in 1986 to detect and monitor HIV seroprevalence in populations at acute-care hospitals in metropolitan areas throughout the United States. Hospitals were enrolled in the study from late 1986 through 1988. Approximately 140,000 specimens were tested annually (3,600 per hospital). In 1991 and 1992, blood specimens were sampled anonymously from patients of all ages at 39 large acute-care hospitals (Figure 1). Sampling was weighted in terms of age and sex to reflect the composition of the general population rather than that of the hospital population, which is skewed toward the elderly and toward women of reproductive age.

To better reflect levels and trends of HIV infection over time in communities served by these hospitals, we excluded from the analysis blood specimens from persons whose hospital visit was specifically for a medical condition associated with HIV infection (such as AIDS, pneumonia, or other infectious disease) or for a condition related to considerably increased risk of exposure to HIV infection (such as hemophilia or a drug-overdose). Therefore, observed prevalence rates of HIV infection among persons seeking care at sentinel hospitals underestimate the actual prevalence rates among all patients treated at those hospitals. Sentinel hospitals are located primarily in urban areas; HIV prevalence in patients from these hospitals is expected to be, on average, higher than that in similarly sampled populations in all U.S. hospitals.

Figure 18 indicates the overall prevalence of HIV for

Figure 18. HIV seroprevalence in 39 sentinel hospitals, 1991 through 1992

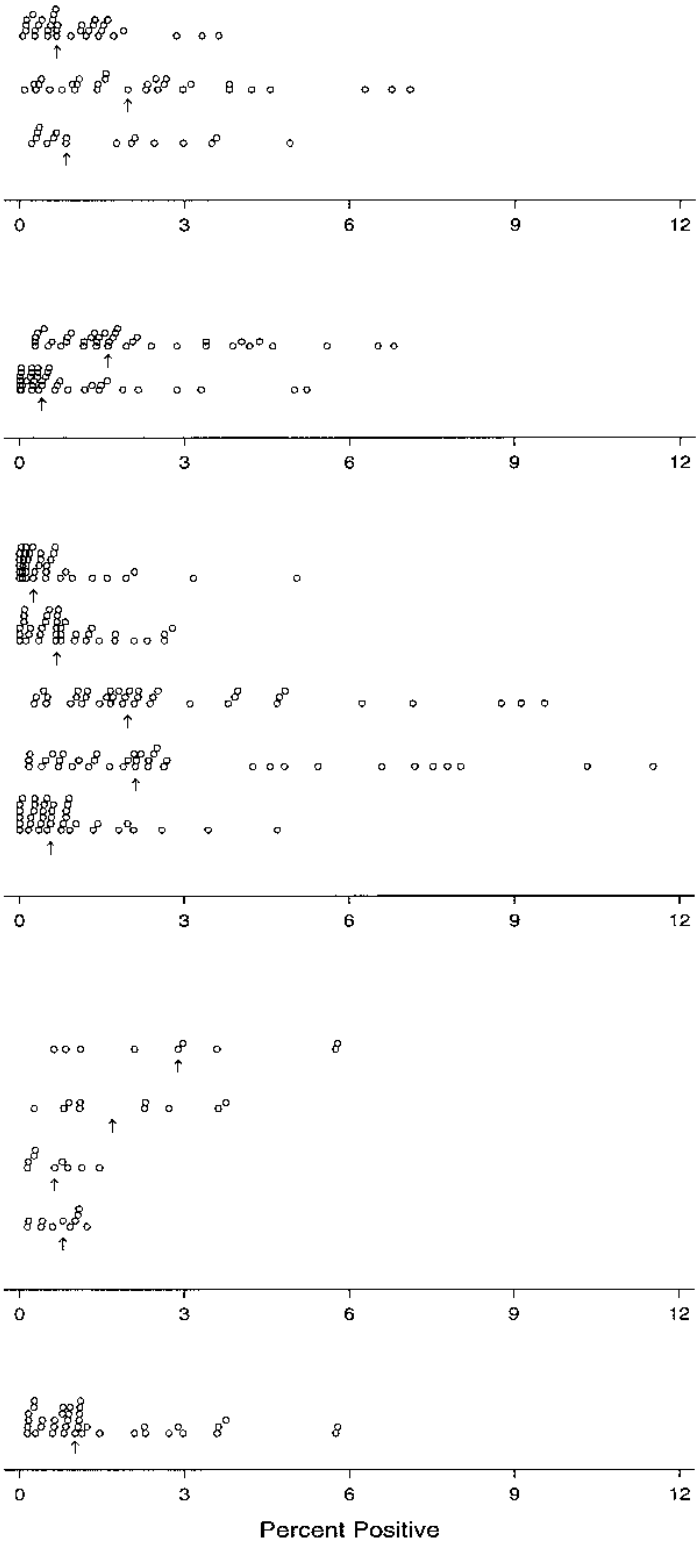
Race	Specimens tested	Percent positive Median	(Range)
White	114,085	0.7	(0.1- 3.6)
Black	72,843	2.0	(0.1- 7.1)
Hispanic	47,046	0.9	(0.2- 4.9)

Sex	Specimens tested	Percent positive Median	(Range)
Male	125,603	1.6	(0.3- 6.8)
Female	141,086	0.4	(0.0- 5.2)

Age	Specimens tested	Percent positive Median	(Range)
<= 14	61,521	0.3	(0.0- 5.0)
15-24	41,713	0.7	(0.0- 2.8)
25-34	48,297	2.0	(0.3- 9.5)
35-44	42,759	2.1	(0.2-11.5)
45+	72,399	0.6	(0.0- 4.7)

Region	Specimens tested	Percent positive Median	(Range)
Northeast	65,185	2.9	(0.6- 5.8)
South	59,525	1.7	(0.3- 3.8)
Midwest	62,390	0.6	(0.1- 1.5)
West	79,589	0.8	(0.1- 1.2)

	Specimens tested	Percent positive Median	(Range)
All hospitals	266,689	1.0	(0.1- 5.8)



Legend: ↑ = Median, ° = One hospital with 100 or more specimins tested

the hospitals participating in 1991 and 1992. This figure also shows prevalence estimates by geographic region and by population subgroups for which subgroups with 100 or more patients tested. The large variation among hospitals (range 0.1% to 5.8%) demonstrates the marked difference of intensity of the HIV epidemic in various parts of the country. The high HIV prevalence among patients treated for conditions not associated with HIV in hospitals in some urban areas presumably reflects high prevalence rates in the communities served by these hospitals.

Since the beginning of the study, a number of sentinel hospitals have become referral centers for AIDS and HIV-related conditions. Although our sampling system is designed to exclude patients whose current hospital visit may be HIV-related, HIV-infected patients may preferentially use these hospitals even for conditions unrelated to their HIV infection.

Interpretation of Findings and Conclusions

Contemporary patterns and trends in the U.S. HIV epidemic among adults are primarily influenced by interrelated subepidemics among three groups at risk for HIV infection: men who have sex with men, injecting drug users, and heterosexuals. Among children, the pediatric HIV epidemic is related to the subepidemics among female injecting drug users and women who have acquired HIV heterosexually. Data from CDC's National HIV Serosurveillance Program presented in this report provide extensive information about each of these interrelated subepidemics.

STD clinic surveys provide the bulk of the data about HIV infection prevalence among men who have sex with men. HIV prevalence rates among these men attending STD clinics were higher (median clinic prevalence 25.5%) than those of any other group surveyed. HIV prevalence exceeded 15% in nearly every participating U.S. city. Nevertheless, HIV prevalence rates decreased among men who had sex with men, with a median absolute 5.7% decrease in prevalence among the 42 clinics with data from both 1989-1990 and 1991-1992. This decrease was especially pronounced among whites. The high seroprevalence among young men who had sex with men suggests that new HIV infections (incidence) continued to occur. However, the trends toward decreasing HIV seroprevalence, particularly among young persons, suggest that the incidence also decreased over time.

An important limitation of these STD clinic-based HIV prevalence data is that they were gathered from men with other sexually transmitted diseases. This limitation could have had two effects: 1) the observed HIV seroprevalence in STD clinics was likely higher than the overall prevalence among men who had sex with men, and 2) observed decreases in HIV prevalence could have underestimated true decreases among all men who had sex with men because persons who had changed their behavior to lower their risk for STDs, including HIV, would have been less likely to attend an STD clinic. The unchanging HIV prevalence rates among injecting drug users and heterosexuals without other acknowledged HIV risks at these same STD clinics indicate that the decreasing HIV prevalence among men who had sex with men did not simply result from a general change occurring among all STD clinic clients.

Drug treatment centers and STD clinics participating in CDC's National HIV Serosurveillance Program provided the two primary sources of data about HIV infection among injecting drug users. The seroprevalence among injecting drug users entering drug treatment programs (median 7.5%) was the second highest of any group surveyed. Seroprevalence rates were slightly lower (median 5.4%) among injecting drug users at STD clinics. In contrast to men who had sex with men, the HIV seroprevalence among injecting drug users was markedly diverse, with rates from 15% to 40% in most cities along the Atlantic Coast and in Puerto Rico and generally below 7% elsewhere. There was no clear temporal trend in seroprevalence, with equal numbers of clinics increasing and decreasing in prevalence from 1989-1990 to 1991-1992. These data suggest that in most cities HIV seroprevalence among persons entering drug treatment programs increased to a certain level before 1989 and since has remained relatively constant. The reasons for the persistent geographic heterogeneity in seroprevalence are unknown.

To what extent clients entering drug treatment represent all injecting drug users is unknown. Nevertheless, HIV seroprevalence data from injecting drug users in two diverse settings -- drug treatment centers and STD clinics -- were consistent in magnitude and in temporal and geographic trends. Stable seroprevalence rates over time do not mean that new infections did not occur, but rather that the incidence roughly equaled the rate that HIV-infected persons left the population of injecting drug users, either through long-term cessation of drug use, illness, or death. The fact that

injecting drug users and men who have sex with men still acquire STDs demonstrates their continued risk for exposure to HIV and underscores the need for continuing prevention activities among persons who practice these risk behaviors.

Inferences from serosurveillance data about the levels and trends of heterosexually acquired HIV infection are hard to make. First, ruling out risk behaviors other than heterosexual contact is often difficult. For example, even among persons who acknowledge sex with injecting drug users, the possibility that they had injected drugs themselves usually cannot be excluded. Because of the high HIV prevalence rates among men who have sex with men and injecting drug users, misclassifying only a few of these persons can greatly increase the apparent prevalence among heterosexuals who do not inject drugs. Second, a large percentage of the population is at risk for HIV from heterosexual contact; however, the level of risk varies enormously depending on factors such as sexual behavioral norms, social mixing patterns, and HIV prevalence in a community. Thus data from sentinel populations are difficult to generalize. Finally, the HIV epidemic among heterosexuals is primarily composed of two subepidemics: 1) persons who have heterosexual contact either with injecting drug users or with men who have had sex with men, and 2) persons whose only exposure is heterosexual contact with someone who also acquired HIV through heterosexual contact.

Despite these limitations, conclusions can be drawn about the prevalence of heterosexual transmission. The first is that the seroprevalence, even among those probably at high risk for acquiring HIV heterosexually, remains much lower than that among injecting drug users and men who have sex with men. In STD clinics in 1991-1992, the median prevalence rates among persons who did not report male homosexual contact or injecting drug use were 0.9% among men and 0.6% among women.

Another insight is that the relatively stable or increasing HIV prevalence rates in many surveillance populations suggest that HIV incidence from heterosexual transmission is stable or increasing. A notable finding is the doubling of HIV seroprevalence among young women entering the Job Corps between 1988 and 1992. This increase was probably due to heterosexual transmission because other data indicate that few seropositive women entering the Job Corps during that time had injected drugs. On the other hand, seroprevalence was stable in STD clinics among persons who reported no male homosexual contact or injecting drug use. In other populations that had no HIV risk behavior information available, HIV prevalence rates among women either remained generally stable (applicants for military service, women's reproductive health clinics) or increased slightly (survey in childbearing women).

When HIV risk behavior information was available, heterosexual transmission was the predominant mode of transmission among women in several populations surveyed by CDC's National HIV Serosurveillance Program. These included Job Corps entrants, women attending adolescent and young adult clinics, homeless adults, and blood donors. Although heterosexual transmission was the predominant mode of HIV acquisition among female blood donors, HIV prevalence among all female first-time donors was only 0.0152%. This low prevalence was probably due to the exclusion from donation of women who injected drugs or who had sex with injecting drug users or bisexual men. Nevertheless, these data indicate that heterosexual transmission of HIV to women from men who also acquired HIV heterosexually is very rare among populations represented by blood donors.

Data from national HIV serosurveillance also provided substantial information about geographic variations in HIV

prevalence in the population-at-large. Among sentinel populations not chosen because of specific HIV risk behaviors, HIV seroprevalence rates had marked geographic heterogeneity, suggesting enormous differences in impact of the HIV epidemic among U.S. communities. For example, HIV seroprevalence among sentinel hospital patients varied nearly 60-fold (range 0.1%-5.8%). Although the relationship between HIV seroprevalence in the sample population and that in the community served by the hospital was unknown, the extremely high seroprevalence at some hospitals indicated that HIV had a substantial impact in some inner city communities, particularly in the Northeast. The Survey in Childbearing Women, the only population-based sentinel surveillance survey, also indicated substantial variation in seroprevalence rates among states (range 0.00%-0.68%). Additionally, data from this survey signified that HIV seroprevalence was generally higher in metropolitan than in rural areas; however, an exception to this pattern was the high seroprevalence among childbearing women in the rural South. A similar trend was observed among Job Corps applicants.

HIV serosurveillance data also indicated the persistence of marked racial and ethnic disparities in HIV seroprevalence. Seroprevalence was substantially higher among blacks than among whites in nearly every serosurveillance population. For example, in STD clinics, black men who had sex with men had higher HIV prevalence (median 43.6%) than white men (median 23.2%). Similarly, black injecting drug users had higher seroprevalence (median 18.4%) than whites (median 3.8%). The data from Hispanics were less consistent. In the Western states, HIV seroprevalence was similar among Hispanics and whites, while in states along the Atlantic Coast, seroprevalence was higher among Hispanics than among whites. The marked racial and ethnic differences in HIV prevalence, even among persons treated in the same clinic, suggests that both behavioral norms and complex social mixing patterns within racial and ethnic groups are important determinants of HIV transmission risk.

An important finding was the substantial decrease in HIV seroprevalence among young men applying for military service and entering the Job Corps. In these two young populations, HIV prevalence trends probably closely reflect recent HIV incidence trends. Although this decrease may be due to fewer men with behavioral risks for HIV applying for entrance in the military or Job Corps, recruiting policies with respect to HIV did not substantially change through 1992. While the HIV seroprevalence data cannot provide a definitive explanation for this decrease, data from STD and drug treatment clinics suggest that this finding most likely reflects decreasing HIV incidence among men who have sex with men. Although serosurveillance data from applicants for military service and the Job Corps have important limitations and biases, the fact that HIV prevalence among women is similar or higher than that among men may indicate a trend toward more equal HIV incidence among young men and women. This is in marked contrast to findings from AIDS surveillance which suggest that the vast majority of the incident infections in the 1980s occurred among men.

The Survey in Childbearing Women provides precise information on current seroprevalence trends among childbearing women and estimates of pediatric HIV incidence. HIV seroprevalence increased slightly from 1989-1990 (0.16%) to 1991-1992 (0.17%), with comparatively larger increases in the South and decreases in the Northeast. These data indicate that in 1991-1992, there were nearly 7,000 live births to HIV seropositive women per year. Based on a perinatal transmission rate between 20% and 30%, 1400 to 2100 newborns were infected per year. black women were three to 28 times more likely than white women to be seropositive and accounted

for 63% of all seropositive women in the 21 states that collected data on race/ethnicity. In five states, more than one percent of black childbearing women were seropositive. These data underscore the importance of preventing HIV infection in women of childbearing age.

Uses of HIV Serosurveillance Data

A primary purpose of the national HIV serosurveillance system is to provide information on the prevalence and trends of HIV infection for local, state, and national public health officials to use in designing and evaluating prevention activities. The value of this national sentinel HIV serosurveillance is becoming more apparent as the public health community is continually adjusting or modifying efforts to stop or decrease the transmission of HIV. The importance of these data, especially when used with other data sources, was emphasized in a 1990 publication, *CDC Plan for Preventing Human Immunodeficiency Virus (HIV) Infection: A Blueprint for the 1990s*. It states that knowledge gained from surveillance and laboratory, behavior, and epidemiology studies should provide the basis for national prevention efforts.

In early 1993, various initiatives to promote broader community-based involvement in setting HIV prevention priorities were introduced to the public health community. These initiatives, regardless of when and how they are implemented, will likely increase the need for data on HIV prevalence and incidence. Community-based planning and advisory bodies will require extensive information about the HIV epidemic in their areas if they are to effectively identify and set priorities for unmet prevention needs within specific populations.

As participants in the process of setting HIV prevention priorities and allocating resources, community-based advisory groups, will expect health departments and other sources to be able to provide timely data. While not representative of entire populations within the areas where surveys have been conducted, serosurveillance data already available provide many insights about where and in which groups HIV occurs and can be used in a community-based approach to prevent the transmission of HIV.

Many state and local health departments have used HIV serosurveillance and other data, such as AIDS case surveillance data, to describe the magnitude and trends of the HIV epidemic in their communities. For example, in Delaware, HIV serosurveillance and other data sources suggested that heterosexual transmission to black women living in poverty may account for a large proportion of the new infections occurring in the state. In Alabama, data from the Survey in Childbearing Women were used to project future AIDS cases and HIV infection as part of a Health Resources and Services Administration cost and needs assessment demonstration project. In many instances, results from these analyses have led policy makers and legislators to increase resources for HIV prevention and care. In Washington, D.C., an area with high HIV seroprevalence rates in a range of studied populations, survey data were used, along with other information, to develop the District's "Five Year (1992-1996) Comprehensive HIV/AIDS Plan." In Minnesota, summary reports for each seroprevalence survey were written and distributed to the participating sites, health professionals, and the health department's AIDS/HIV prevention staff for use in establishing operational and funding priorities. Data are updated monthly and distributed free to over 400 persons and organizations; analyses are provided on request to persons or organizations providing or evaluating the need for HIV prevention or service programs. In Connecticut, serosurveillance data were used in setting legislative and policy development initiatives including programs for needle exchange and HIV testing of minors.

Because the Survey in Childbearing Women is population based and provides accurate estimates of HIV prevalence among childbearing women and of the incidence of perinatal HIV transmission, it has proven particularly useful to state and local health departments in planning HIV preven-

tion programs aimed at women and children. For example, in Connecticut, data from the Survey in Childbearing Women and from women's health clinic surveys formed the basis of recommendations for HIV education, counseling, and testing of women. In Alabama, Survey in Childbearing Women data indicated that young women in rural areas should be provided intensified HIV prevention messages. In Florida, survey data provided to each health district are used locally for a wide variety of planning, educational, and other purposes, including the formulation of requests for funding through the Ryan White Comprehensive Care Act of 1990. Survey data have also been used in Florida to evaluate the completeness of pediatric AIDS surveillance. In Maryland, survey data have been used to target prevention programs aimed at newer populations at risk, such as teenagers, and to implement church-based, geographically targeted HIV education and prevention programs. The data have also been used to assist the Governor's Commission on Women's Health in developing recommendations related to HIV and women's health in Maryland.

Data from the national HIV serosurveillance program have also been used in a variety of other settings by state and local health authorities. In Alabama, HIV prevalence data from patients with tuberculosis led to a policy that all clients receiving tuberculosis services be offered voluntary HIV counseling and testing. HIV seroprevalence data from Alabama correctional facilities indicating that for every known HIV-infected inmate, there were six to seven without known HIV infection led to increased awareness of the need for universal HIV educational messages to this high risk group. Survey data from injecting drug users were used to determine which of two drug treatment centers receiving Alabama Department of Public Health funds for counseling and testing should expand their services to include psychological and/or behavior modification counseling. The center with expanded services had been identified as having a 2% prevalence of HIV infection among clients while no HIV positive clients were identified in the other center. In Florida, correctional facility survey data were used to implement and evaluate HIV education and prevention programs in a local facility. Survey data from Florida have also been used to assess HIV prevention needs for homeless persons.

The standardization of the surveys has allowed local- and state-generated serosurveillance data to be interpreted on a national scale. For example, HIV serosurveillance data have been used with AIDS case surveillance data to estimate the total number of HIV-infected persons and the annual number of new infections in the United States. Because most HIV serosurveillance data are gathered in medical care settings, they are directly and broadly applied in developing national policies and guidelines relevant to medical practice. Estimates from sentinel hospital data of the number of HIV-infected hospitalized patients has led to calls for development and expansion of hospital-based voluntary HIV counseling and testing services in high-risk communities as a way to reach populations not accessible by other means, such as injecting drug users not in drug treatment. Serosurveillance data from blood donors have aided in developing national policies for blood donor screening and in estimating the risk of HIV transmission from HIV-antibody screened blood. Data from the Survey in Childbearing Women have been instrumental in developing national guidelines for preventing perinatal transmission.

Much of the power of HIV serosurveillance is that it provides data on the most current trends of the HIV epidemic to policy makers and program planners at local, state, and national levels. To continue to be useful as the HIV epidemic evolves and as HIV prevention and treatment strategies change, the national serosurveillance system should also evolve. Three general

principles should guide this change. First, the system must be flexible enough to meet local and state needs yet should be sufficiently standardized so that national surveillance needs are met. Second, because the ability to monitor trends is the mainstay of surveillance, extreme care should be taken to ensure modifications to the national serosurveillance system do not hamper its ability to monitor HIV trends. Third, data-driven decision making can be only as good as the quality of the data. Developing and maintaining the serosurveillance infrastructure at local, state, and national levels for collection of high quality data should remain a priority.

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