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MORBIDITY AND MORTALITY WEEKLY REPORT

Human Immunodeficiency Virus Infection in the United States

The following report summarizes the review of current knowledge on human immunodeficiency virus (HIV) infection in the United States that was presented to the Domestic Policy Council. The review was conducted during the period September-November 1987, by CDC in conjunction with the National Institute on Drug Abuse of the Alcohol, Drug Abuse, and Mental Health Administration and the National Institutes of Health. Although the various studies reviewed differ in design and cannot be precisely compared, the review yielded a description of the approximate patterns and trends of HIV infection in this country.

Background

Over 46,000 cases of acquired immunodeficiency syndrome (AIDS), which is a result of HIV infection, have been reported to CDC since 1981. The mean interval between infection with HIV and the onset of AIDS exceeds 7 years. Thus, information on the number of currently infected individuals (prevalence) and the rate at which new HIV infections occur over time (incidence) is vital to monitoring the progression of the HIV epidemic.

Transmission of HIV infection can be slowed or halted by reducing or eliminating the behaviors that place individuals at risk for acquiring the infection. Better and more extensive information is essential for targeting and evaluating control and prevention efforts at local and state levels, for predicting future health-care needs, and for understanding where the HIV/AIDS epidemic is headed. Surveillance of the prevalence and incidence of HIV infection through continually monitoring sentinel populations, expanding focused seroprevalence studies, and developing models to help interpret the data remains a critical element of the nation's response to this major public health crisis.

HIV Infection in the United States

Infection Among Groups at Recognized Risk. Observed prevalence of infection remains highest in those groups that account for the vast majority of AIDS cases. In 50 studies throughout the country, seroprevalence among homosexual and bisexual men has ranged from under 10% to as high as 70%; however, most findings have been between 20% and 50%. In 88 studies of intravenous (IV) drug abusers, HIV antibody prevalence has ranged from 50% to 65% in the New York City vicinity and Puerto Rico to rates that, although varied, have been mostly below 5% in areas other than the East Coast.

HIV antibody prevalence among persons with coagulation disorders requiring clotting factor concentrates (hemophiliacs) has varied according to the type and

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severity of the disorder. The overall prevalence among hemophilia A patients has been approximately 70%; for hemophilia B patients, it has been 35%. These rates appear uniform throughout the country and reflect the national distribution of clotting factor concentrates.

The prevalence of HIV infection among regular heterosexual partners of infected persons has ranged from under 10% to 60%. Among partners of those who are at risk but whose HIV status is unknown, the prevalence has generally been under 10%.

Infection Among Groups Within the General Population. In selected groups within the general population—blood donors, civilian applicants for military service, Job Corps entrants, sentinel hospital patients, and women seen in family planning and other women's health clinics—the prevalence of HIV infection has generally been a fraction of 1%. However, seroprevalence rates have varied considerably and have been found to be much higher among selected inner city populations.

Persons at increased risk for HIV infection are asked not to donate blood; therefore, the prevalence and incidence rates of donor groups underrepresent the actual rates in the population. The overall prevalence of HIV antibody among Red Cross blood donors who have not been previously tested has averaged 0.04%. Applicants for military service, who underrepresent persons in the principal risk groups for HIV infection, have had a crude HIV antibody prevalence of 0.15%, which, when adjusted to the age, sex, and racial composition of the 17- to 59-year age group of the U.S. population, is 0.14%. Job Corps entrants (disadvantaged youths 16 to 21 years of age) have had a prevalence of 0.33%. Patients without AIDS-like conditions who have been tested anonymously at four sentinel hospitals have had a prevalence of 0.32%; the sex- and age-adjusted prevalence for military applicants from the same cities has been 0.11%.

Childbearing women in Massachusetts who were tested anonymously through filter-paper blood specimens from their newborn infants had an HIV antibody prevalence of 0.21%. Female applicants for military service from the same state have had a prevalence rate of 0.13%. The findings from surveys in women's health clinics have ranged from 0 to as high as 2.60% positive.* The higher prevalences have occurred in areas where the incidence of AIDS is high among women.

HIV Antibody Prevalence by Geographic Location, Age, Sex, and Race or Ethnicity. The geographic distribution of HIV antibody prevalence among blood donors and applicants for military service and, to a limited extent, among homosexual men and IV drug abusers has been similar to the geographic distribution of AIDS cases (i.e., highest on the East Coast and West Coast and lowest in the northern Midwest and Mountain states). In addition, HIV antibody prevalence, like AIDS case incidence, has been greater in urban than in rural areas. Like AIDS cases, HIV infection among groups within the general population and among high-risk groups has been concentrated among young to early middle-aged adults and has consistently been more common among men and among blacks and Hispanics.

Heterosexuals. Information on the extent of HIV infection among persons who are exclusively heterosexual, do not use IV drugs, and have no known sexual exposure to persons at increased risk for HIV infection comes from two principal sources: 1) evaluation of the risk factors of seropositive blood donors and applicants for military service and 2) HIV surveys among heterosexuals attending sexually transmitted disease (STD) clinics.

*These surveys exclude pregnant drug users, whose prevalence reached nearly 30.0%.

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Limited studies of the exposure risks of seropositive blood donors, military applicants, and active duty military personnel suggest that approximately 85% of such individuals have identifiable risks for HIV infection. If the risk factor data from these limited studies prove to be consistent in more extensive national studies, then HIV antibody prevalence levels in persons without acknowledged or recognized risks would be below 0.02% for military applicants and below 0.01% for blood donors. However, more extensive studies on risk factors are urgently needed, particularly in inner city areas where AIDS case surveillance data suggest that heterosexual HIV transmission occurs.

In limited studies in which the subgroup of heterosexuals at highest risk (those being treated for STD) have been rigorously interviewed and those who are seropositive have been reinterviewed, the prevalence of HIV infection has generally ranged from 0 to 1.20% for persons without specific, identified risk factors. By contrast, the prevalence of infection among homosexual men at the same clinics has ranged from 12% to over 50%.

HIV Infection Trends Over Time and the Incidence of New Infection. Much less information exists on the trends and incidence of HIV infection than on its prevalence, and such data are much more difficult to develop. In the two general population groups tested over time (applicants for military service and first-time blood donors) HIV antibody prevalence rates have remained stable for 2 years, although the prevalence among donors has fluctuated seasonally. Increased self-exclusion of persons who know that they either are at risk or are already infected may have contributed to this observed prevalence pattern. The apparent stability may reflect the competing effects of self-exclusion by infected persons and the continued occurrence of new HIV infections.

There is evidence that new infections continue to occur among blood donors, military personnel, and groups at increased risk. However, in some groups, the rate of new infection may have declined somewhat from the rates that prevailed in the early 1980s. This interpretation is supported by the following observations: 1) declines in incidence of new infections have been observed in eight cohorts of homosexual men (the current principal risk group); 2) the net seroprevalence among military applicants and donors no longer appears to be rising; and 3) serologic screening of blood products and heat treatment of clotting factor concentrates have significantly reduced new infection in transfusion recipients and hemophiliacs. However, insufficient trend and incidence data are available to evaluate recent patterns in IV drug abusers or heterosexually active persons or in local geographic areas such as the inner cities.

The HIV/AIDS epidemic is a composite of many individual, though overlapping, smaller epidemics, each with its own dynamics and time course. The incidence of new infection in certain subgroups may have declined somewhat; however, in the absence of specific information, incidence rates cannot be assumed to have declined in all subgroups or in all geographic areas. It is important that trends be monitored among the various groups at increased risk, with particular emphasis on the groups and settings in which the pattern of transmission may be changing (i.e., IV drug abusers and heterosexually active persons and in localized areas such as inner cities). Data are insufficient to determine precisely the overall trends and incidence of HIV infection.

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In 1986, public health and medical specialists from within and outside the government were convened by the Public Health Service to develop a working estimate of the number of Americans with HIV infection. They estimated that between 1 and 1.5 million persons were infected. This conclusion was based on the estimated sizes of populations at risk and the estimated average seroprevalence values for those populations. Since then, this computation has been reexamined in light of recently available data; other data, on AIDS cases and disease progression, have been used to explore mathematical models. The resulting estimates vary widely, but they are consistent with the 1986 figures. The estimation of the total number of infected persons will remain complex and inexact. There is no substitute for carefully obtained incidence and prevalence data. Additional surveys and studies are needed to determine the current extent of spread of HIV through the population.

The full report on the review of HIV infection in the United States is being published as an *MMWR* supplement (Vol. 36, No. S-6) and will be dated December 18, 1987.

Epidemiologic Notes and Reports

Adult T-Cell Leukemia/Lymphoma Associated With Human T-Lymphotropic Virus Type I (HTLV-I) Infection – North Carolina

A case of adult T-cell leukemia/lymphoma (ATL) associated with human T-lymphotropic virus type I (HTLV-I) has been reported from North Carolina. The patient, a black adult male, developed jaundice in December 1986, after several weeks of anorexia, fatigue, and fever.

When admitted to the hospital, he had an enlarged liver, a serum bilirubin level of 15.5 mg/dL, and an SGOT level of 279 IU/L, but serologic tests for hepatitis B markers and hepatitis A antibody were negative. Ultrasound examination revealed no evidence of intra- or extra-hepatic obstruction. He was thought to have alcoholic hepatitis. During the next week, he became pancytopenic, and bone marrow biopsy revealed hypocellularity of all cell lines but no malignant infiltrates. He was given transfusions of red blood cells and platelets and was discharged in February 1987, despite continued clinical and laboratory abnormalities. The diagnosis upon discharge was resolving hepatitis.

In March 1987, the patient returned to the hospital because of abdominal pain, nausea, vomiting, and somnolence. Laboratory studies revealed a leukocytosis with abnormal lymphocytes, a calcium level of 20.5 mg/dL, and an amylase level of 1,209 IU/L. He was thought to have ATL with hypercalcemia and consequent acute pancreatitis. His condition deteriorated despite chemotherapy and treatment for hypercalcemia, and he died on March 22. Autopsy revealed leukemic infiltrates in the spleen, bone marrow, and kidneys. When peripheral blood mononuclear cells obtained before the patient's death were subjected to flow cytometric analysis, 95% of the cells were of the CD4+ (T-helper cell) phenotype. Antibodies against HTLV-I were detected in several serum samples by radioimmunoassay and by Western blot. HTLV-I was isolated from the man's peripheral blood lymphocytes.