HIV Prevalence Estimates — United States, 2006

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Accurate and timely data on the number of persons living with human immunodeficiency virus (HIV) infection (HIV prevalence) are needed to guide planning for disease prevention, program evaluation, and resource allocation. However, overall HIV prevalence cannot be measured directly because a proportion of persons infected with HIV have neither been diagnosed nor reported to local surveillance programs. In addition, national HIV prevalence data are incomplete because local reporting systems for confidential, name-based HIV reporting have been fully implemented only since April 2008. With the advent of highly active antiretroviral therapies that delay the progression of HIV to acquired immunodeficiency syndrome (AIDS), and of AIDS to death,1 and changes in the AIDS case definition to include an immunologic diagnosis,2 earlier back-calculation methods from the 1990s for estimating HIV prevalence based on the number of reported AIDS cases are no longer reliable. With 80% of states reporting name-based HIV diagnoses as of January 2006, an extended back-calculation method now can be used to estimate HIV prevalence more accurately. Based on this method, CDC now estimates that 1.1 million adults and adolescents (prevalence rate: 447.8 per 100,000 population) were living with diagnosed or undiagnosed HIV infection in the United States at the end of 2006. The majority of those living with HIV were nonwhite (65.4%), and nearly half (48.1%) were men who have sex with men (MSM). The HIV prevalence rates for blacks (1,715.1 per 100,000) and Hispanics (585.3 per 100,000) were, respectively, 7.6 and 2.6 times the rate for whites (224.3 per 100,000).

An extended back-calculation method has been described in detail and was used recently to calculate the incidence of HIV infection in the United States.3 The method was used in this analysis to estimate HIV prevalence based on the number of HIV diagnoses by calendar year and disease severity (i.e., whether the person received an AIDS diagnosis in the same calendar year as the HIV diagnosis). HIV prevalence at the end of 2006 for the 50 states and District of Columbia was estimated using information from the national HIV/AIDS Reporting System for persons aged ≥13 years who were diagnosed with HIV during 2006 and reported to CDC by the end of June 2007. Forty states provided data on both HIV and AIDS diagnoses, whereas 10 states (California, Delaware, Hawaii, Illinois, Maryland, Massachusetts, Montana, Oregon, Rhode Island, and Vermont) and the District of Columbia provided data only for AIDS diagnoses. For the areas without name-based HIV data, statistical procedures and AIDS data were used to estimate HIV cases, based on the ratio of HIV to AIDS in states with integrated surveillance systems.4 The number of undiagnosed HIV infections was calculated by subtracting diagnosed AIDS prevalence and diagnosed HIV prevalence from the estimated overall HIV prevalence. Using an established method, data also were adjusted for reporting delays and redistribution of risk factors among persons initially reported without sufficient information to be classified into an HIV transmission category.5 HIV prevalence rates per 100,000 population were calculated for various demographic characteristics; population denominators for rate calculations were based on official postcensus estimates for 2006.6

Among the estimated number of persons living with HIV at the end of 2006, 46.1% (1,715.1 per 100,000 population) were black, 34.6% (224.3 per 100,000) were white, 17.5% (585.3 per 100,000) were Hispanic, 1.4% (129.6 per 100,000) were Asian/Pacific Islander, and 0.4% (231.4 per 100,000) were American Indian/Alaska Native. Males accounted for 74.8% of prevalent HIV cases (685.7 per 100,000). The greatest percentage of cases was attributed to male-to-male sexual contact, accounting for 48.1% overall (and 64.3% among men). High-risk heterosexual contact, defined as heterosexual contact with a person known to have, or to be at high risk for, HIV infection (e.g., an injection drug user) accounted for 27.6% of prevalent cases overall (12.6% of cases among men and 72.4% of cases among women). Injection drug use (IDU) accounted for 18.5% of total cases (15.9% of cases among men and 26.3% of cases among women). The remainder of cases were attributed to men who reported both male-to-male sexual contact and IDU (3.0%) or whose transmission category was classified as other (0.8%; including hemophilia, blood transfusion, perinatal exposure, and risk factors not reported or not identified). Overall, an estimated 232,700 (21.0%) persons living with HIV infection had not been diagnosed as of the end of 2006.

The HIV prevalence rate for black men (2,388.2 per 100,000 population; 95% confidence interval [CI] = 2,197.9—2,578.4) was six times the rate for white men (394.6 per 100,000; CI = 363.3—425.9) (Figure), and the rate for Hispanic men (883.4 per 100,000; CI = 784.9—982.4) was more than twice the rate for white men. The HIV prevalence rate for black women (65.2 per 100,000; CI = 49.4—81.3) was nearly 18 times the rate for white women (26.7 per 100,000; CI = 21.3—32.9) (Figure), and the rate for Hispanic women (263.0 per 100,000; CI = 231.6—294.4) was more than four times the rate for white women. The HIV prevalence rate for black women was greater than the rate for all other groups, except for black men.
CDC Editorial Note: Reduced mortality resulting from the use of highly active antiretroviral therapies is a major factor contributing to the number of persons in the United States living with HIV disease. Additionally, more than 56,000 new HIV infections are estimated to occur annually.

The estimate of HIV prevalence in this report is similar to an estimate for 2003 (1,039,000—1,185,000) that used the same extended back-calculation method. However, because of improvements in national HIV surveillance data since 2003, the two estimates cannot be compared directly. The 2006 estimate is based on a data set that (1) includes HIV diagnoses from 10 states that were not reporting in 2003 and (2) has been refined by an improved ability to identify and remove duplicate HIV case data that reflect reports by more than one state. Using the refined data set, CDC now estimates the HIV prevalence for 2003 to have been 994,000, suggesting that HIV prevalence in the United States increased by approximately 112,000 (11.3%) from 2003 to 2006. Analysis of the refined data also indicated that the percentage of HIV-positive persons who were undiagnosed decreased from approximately 25% in 2003 to 21% in 2006; an estimated 30% of this change resulted from a decrease in the number of undiagnosed persons, and 70% resulted from an increase in the total number of persons living with HIV (CDC, unpublished data, 2008).

The burden of HIV infection was disproportionate among populations. Blacks made up 12% of the adult and adolescent population in the United States in 2006, but accounted for 46.1% of persons estimated to be living with HIV. Similarly, nearly half (48.1%) of the persons living with HIV were MSM, and although not precisely known, the percentage of MSM in the general population is estimated to be much lower. Data from CDC’s National Survey of Family Growth indicate that, among males aged 15—44 years, 3.7% ever have had anal sex with another male, and the proportion of men who had a male sexual partner in the past 12 months was 2.9%.

The findings in this report are subject to at least three limitations. First, reported HIV data used in the extended back-calculation method represent only a portion of persons in the United States who were diagnosed with HIV infection; several high-morbidity areas, including California, Illinois, Maryland, and the District of Columbia, did not contribute HIV data. Availability of reported HIV data from these areas will increase accuracy of future prevalence estimates. Second, not all persons who are infected with HIV have been diagnosed and reported to the public health surveillance system, and data must be estimated for undiagnosed persons. Finally, the data have been adjusted statistically to account for delays in reporting new cases and deaths, and cases reported without risk factor information have been redistributed among other transmission categories. These adjustments were based on risk redistribution assumptions from the mid-1990s that might no longer be valid, which could result in over- or under-adjustment of the data.

Previous studies have indicated that persons generally reduce their sexual risk behaviors (e.g., decrease the number of sex partners and reduce unprotected intercourse through increased condom use) after being diagnosed with HIV. Thus, increasing the percentage of HIV-infected persons who are diagnosed and linked with effective care and prevention services has the potential to reduce new HIV infections over time. To help achieve that, CDC has focused resources on increasing testing for HIV, particularly among populations that are disproportionately affected by HIV infection. Recent CDC activities have included publication of revised recommendations for HIV
testing in health-care settings\(^9\) and creation of a new program, the Heightened National Response to the HIV/AIDS Crisis in the African American Community.\(^{10}\) In 2007, as part of the President’s Domestic HIV Initiative, CDC allocated funds to expand routine HIV testing, primarily among blacks. In addition to testing, expanding the number and reach of effective HIV prevention services for at-risk populations, including blacks, Hispanics, and MSM of all races, can contribute to reducing the disproportionate numbers of infections in these groups. Culturally appropriate opportunities for HIV testing, diagnosis, and access to early treatment and prevention services to reduce further HIV transmission are key to reducing new infections and ultimately decreasing HIV prevalence in the United States.

**REFERENCES**

10 Available.

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**Implementation of Newborn Hepatitis B Vaccination—Worldwide, 2006**

**MMWR. 2008;57:1249-1252**

2 tables omitted

GLOBALLY, HEPATITIS B VIRUS (HBV) INFECTIONS are a major cause of cirrhosis and liver cancer and result in an estimated 620,000 deaths annually.\(^1\) In 1992, the World Health Organization (WHO) set a goal for all countries to introduce hepatitis B (HepB) vaccine into national routine infant immunization programs by 1997.\(^2\) In countries where a high percentage of HBV infections are acquired perinatally (where general population prevalence of chronic HBV infection is \(\geq 8\%\)), WHO recommends administering the first HepB vaccine dose \(<24\) hours after birth to prevent perinatal HBV transmission.\(^3\) To assess implementation of newborn HepB vaccination, the most recently available data were examined from the Joint Reporting Form used by the World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF) to track worldwide vaccine coverage for WHO-recommended infant immunizations.\(^4\) In 2006, a total of 162 (84\%) of 193 countries had introduced HepB vaccine into their national infant immunization schedules. Among the 193 countries, 81 (42\%) reported using a schedule with a HepB vaccine birth dose (defined as a dose administered within 24 hours of birth). Worldwide, 27\% of newborns received a HepB vaccine birth dose in 2006. In the 87 countries with \(\geq 8\%\) chronic HBV infection prevalence,\(^5\) HepB vaccine birth dose coverage was 36\%. These findings highlight the global need to implement this key hepatitis B prevention strategy more widely.

Since 1998, WHO and UNICEF have used the Joint Reporting Form to collect information annually from WHO member states on coverage and indicators of immunization system performance for all WHO-recommended infant vaccines.\(^4\) For HepB vaccine, information is collected about the schedule used, the number of infants receiving the recommended 3 doses of vaccine, and (for those countries where the national immunization schedule includes a HepB vaccine birth dose) the administrative coverage of HepB vaccine birth dose.

As of 2006, 81 (42\%) of 193 WHO member states indicated that a HepB vaccine birth dose was included in the national infant immunization schedule. Of the 87 countries where chronic HBV infection prevalence has been high historically (\(\geq 8\%\)), 38 (44\%) reported including a HepB vaccine birth dose in their immunization schedules. Of the 135.0 million infants born worldwide in 2006, 62.7 million infants were born in countries where chronic HBV infection prevalence has been high historically.

Global and regional HepB vaccine birth dose coverage were calculated using reported coverage figures from the Joint Reporting Form and estimates of the number of live births.\(^6\) In this analysis, countries that did not report birth dose coverage on the Joint Reporting Form were assumed to have 0\% birth dose coverage. Among the 81 countries reporting a HepB vaccine birth dose in their immunization schedules, 22 (27\%) did not report birth dose coverage data. As a result, 11\%-20\% of the birth cohort might have received a HepB vaccine birth dose but was assumed to have 0\% coverage because of lack of reporting. Birth dose coverage worldwide was 27\% and varied widely by region, from 3\% to 71\%. Birth dose coverage for countries with \(\geq 8\%\) chronic HBV infection prevalence was 36\% (range by region: 1\%-92\%), and for countries with \(<8\%\) prevalence was 20\% (range by region: 0\%-97\%). However, in response to an open-ended Joint Reporting Form question regarding which vaccination schedule was used, several member states indicated that a first dose administered beyond 24 hours of birth still could be considered a birth dose.

**CDC Editorial Note:** This report presents the first analysis of WHO-UNICEF Joint Reporting Form data that estimates worldwide HepB vaccine birth dose coverage. HepB vaccine birth dose coverage during 2006 was 27\% globally and 36\% for children born in countries where chronic HBV infection has been highly endemic (\(\geq 8\%\)). The relatively low coverage is consistent with survey data from several countries\(^7\) and suggests that program performance for newborn HepB vaccination needs improvement.

Two major modes of HBV transmission occur during infancy: (1) from an infected mother to her newborn during delivery, and (2) from an infected household contact to the infant.