

Terms, Definitions, and Calculations Used in CDC HIV Surveillance Publications

December 2012

The Centers for Disease Control and Prevention (CDC) collects, analyzes, and disseminates surveillance data on HIV infection and AIDS; these data are the nation's source of timely information on the burden of HIV infection. HIV surveillance data are used by CDC's public health partners in other federal agencies, health departments, nonprofit organizations, and academic institutions to help target prevention efforts, plan for services, and develop policy.

DEFINITIONS

This fact sheet contains terms, definitions, and methods of calculation that are commonly applied to HIV surveillance data.

Data on HIV infection in the current HIV Surveillance Report reflect the date of diagnosis of HIV infection—not the date of report to CDC. HIV data are displayed by year of diagnosis.

In the HIV Surveillance Report (<http://www.cdc.gov/hiv/surveillance/resources/reports/2010report/index.htm>), CDC publishes unadjusted and adjusted—that is, estimated—data for cases of HIV infection and AIDS.

Unadjusted data include persons who were diagnosed with HIV infection or AIDS and have been reported to CDC by state and local health departments through a given point in time. As of April 2008, all 50 states, the District of Columbia, and 6 U.S. dependent areas (American Samoa, Guam, Northern Mariana Islands, Puerto Rico, the Republic of Palau, and the U.S. Virgin Islands) had implemented confidential name-based HIV infection reporting.

Adjusted (estimated) data are calculated by applying statistical adjustments to the unadjusted data, to account for delays in reporting (of diagnoses and deaths) and for missing risk factor information. The statistical adjustments do not account for incomplete reporting. To allow for stabilization of data collection and for adjustment of the data to monitor trends, only areas that have been conducting confidential name-based HIV infection reporting for a sufficient length of time are included in the estimated data. In the 2010 HIV Surveillance Report, estimated data are shown for 46 states and 5 U.S. dependent areas that implemented name-based HIV infection reporting since at least January 2007 and began reporting to CDC by June 2007.

Estimated case counts are considered a more accurate reflection of the burden of disease than unadjusted case counts because they take into consideration diagnoses or deaths that have not yet been reported to the CDC. Therefore, for planning, resource allocation, and program evaluation, it is more appropriate to use the estimated data presented in the HIV Surveillance Report.

CDC monitors data on HIV infection and AIDS. Within those categories, CDC monitors **diagnoses, deaths, incidence, stage of disease at diagnosis, and prevalence**.

HIV and AIDS diagnoses:

AIDS is diagnosed when the immune system of a person infected with HIV becomes severely compromised (measured by CD4 cell count) and/or the person becomes ill with an opportunistic infection or illness. In the absence of treatment, AIDS usually develops 8 to 10 years after initial HIV infection; with early HIV diagnosis and treatment, this may be delayed by many years. With the release of the *Revised Surveillance Case Definitions for HIV Infection Among Adults, Adolescents, and Children Aged <18 Months and for HIV Infection and AIDS Among Children Aged 18 Months to <13 Years—United States, 2008*, (www.cdc.gov/mmwr/preview/mmwrhtml/rr5710a1.htm) CDC has moved to a staging system of HIV infection that includes AIDS (HIV infection, stage 3).

AIDS diagnoses and deaths of persons with an AIDS diagnosis are the number of persons diagnosed with AIDS and the number of persons with an AIDS diagnosis who have died in a given time period, respectively. Note that deaths of persons with an AIDS diagnosis can be due to any cause (i.e., the death may or may not be related to AIDS), and the category is therefore different from the designation deaths due to AIDS.

- Unadjusted AIDS diagnoses and deaths of persons with an AIDS diagnosis are from 50 states, the District of Columbia, and 6 U.S. dependent areas.
- Estimated AIDS diagnoses and deaths of persons with an AIDS diagnosis are from 50 states, the District of Columbia, and 6 U.S. dependent areas. Because all areas implemented confidential name-based AIDS surveillance in the early 1980s, their AIDS data can be adjusted to arrive at the estimations.

Diagnoses of HIV infection and deaths of persons with a diagnosis of HIV infection are the number of persons diagnosed with HIV infection and the number of persons with a diagnosis of HIV infection who have died in a given time period, respectively. Note that diagnoses of HIV infection are regardless of stage of disease at diagnosis (that is, persons diagnosed with HIV infection who have not progressed to AIDS; persons who were diagnosed with HIV infection and AIDS at the same time; and persons who were diagnosed with HIV infection and later received an AIDS diagnosis). Also note that deaths of persons with a diagnosis of HIV infection may be due to any cause (i.e., the death may or may not be related to HIV infection). Other systems provide data on HIV infection as a cause of death in the general population. To provide the reader with a more accurate understanding of the number of persons diagnosed with HIV infection who have died, CDC includes in its surveillance report data on persons diagnosed with HIV infection regardless of the stage of disease at death, which includes persons who may have had an AIDS diagnosis at time of death.

- Unadjusted diagnoses of HIV infection and deaths of persons with a diagnosis of HIV infection are reported to CDC by 50 states and 6 U.S. dependent areas that implemented confidential name-based HIV infection reporting surveillance by April 2008.
- Estimated diagnoses of HIV infection and deaths of persons with a diagnosis of HIV infection are from 46 states and 5 U.S. dependent areas that have had confidential name-based HIV infection reporting since at least January 2007 and began reporting to CDC by June 2007.

Uses of these data: Estimated diagnoses of HIV infection, AIDS diagnoses, and death data provide trends of the burden of disease and are useful for tracking the time from a diagnosis of HIV infection to an AIDS diagnosis or death. Discrepancies between populations in the time from HIV infection diagnoses to AIDS diagnoses or time to death underscore inequities in access to testing and care; this knowledge can help direct resource allocation.

HIV incidence:

In general, HIV incidence is expressed as the estimated number of persons newly infected with HIV during a specified time period (e.g., a year), or as a rate calculated by dividing the estimated number of persons newly infected with HIV during a specified time period by the number of persons at risk for HIV infection.

- Example: In 2010, an estimated 14,900 whites in the United States were newly infected with HIV.
- Example: In 2010, the estimated rate of new HIV infections among blacks/African Americans (68.9) was 7.9 times as high as the rate in whites (8.7).

It is important to understand the difference between HIV incidence and new diagnoses of HIV infection. HIV incidence refers to persons newly infected with HIV, whereas persons newly diagnosed with HIV may have been infected years before being diagnosed.

Uses of these data: Incidence estimates are useful for planning, allocating funds, and evaluating the impact of prevention programs.

Persons living with a diagnosis of HIV infection or AIDS:

These terms denote the number of persons in the 46 states and 5 U.S. dependent areas with long-term, confidential named-based HIV infection reporting who have received a diagnosis of HIV infection and are still alive, or the number of persons in the 50 states, District of Columbia, and 6 U.S. dependent areas who have received an AIDS diagnosis and are still alive.

The data in the HIV Surveillance Report represent the number of persons living with a diagnosis of HIV infection who have been diagnosed, have been reported to the HIV surveillance system, and have not been reported as deceased.

HIV prevalence:

The number of persons living with HIV disease at a given time regardless of the time of infection, whether the person has received a diagnosis (aware of infection), or the stage of HIV disease. Although prevalence does not indicate how long a person has had a disease, it can be used to estimate the probability that a person selected at random from a population will have the disease. CDC reports prevalence as the number of persons living with HIV infection in a given population at a given time and also reports prevalence rates, calculated per 100,000 population.

- Example: At the end of 2009, an estimated 1,148,200 adults and adolescents in the United States were living with HIV infection, including 207,600 (18.1%) persons whose infections had not been diagnosed.
- Example: At the end of 2009, the highest HIV prevalence rate was that among blacks/African Americans (1,685.3 per 100,000 population), followed by the rate among Hispanics/Latinos (617.4).

In 2012, CDC published *Monitoring Selected National HIV Prevention and Care Objectives by Using HIV Surveillance Data—United States and 6 U.S. Dependent Areas—2010, HIV Surveillance Supplemental Report, Volume 17, Number 3 (Part A)*. The estimates include persons infected with HIV who have not been diagnosed nor reported to the HIV surveillance system.

Uses of these data: Prevalence is useful for planning and resource allocation, as it reflects the number of people currently needing care and treatment services for their HIV infection. Prevalence rates are useful for comparing HIV disease between populations and for monitoring trends over time.

Rate:

A measure of the frequency of an event compared with the number of persons at risk for the event. Rates are calculated by dividing the number of events (numerator) by the size of the population (denominator) and including a measure of time. When comparing rates between populations, it is typical to standardize the denominator in order to make direct comparisons. This standardization will depend on the magnitude of the local surveillance data—for national data, the population size is most often standardized to 100,000.

- **Incidence rate:** a measure of the frequency with which new cases of illness, injury, or other health condition occur, expressed explicitly per a time frame. Incidence rate is calculated as the number of new cases over a specified period divided either by the average population (usually mid-period) or by the cumulative person-time the population was at risk.
- **Prevalence rate:** the proportion of a population that has a particular disease, injury, other health condition, or attribute at a specified point in time or during a specified period.

Percentage:

A proportion of the whole, in which the whole is 100.

Proportion:

A portion of a population or a data set, usually expressed as a decimal fraction (e.g., 0.2), a fraction (1/5), or a percentage of the population (20%) or of the data set.

Stage of disease:

In December 2008, CDC published *Revised Surveillance Case Definitions for HIV Infection Among Adults, Adolescents, and Children Aged <18 Months and for HIV Infection and AIDS Among Children Aged 18 Months to <13 Years—United States, 2008* (www.cdc.gov/mmwr/preview/mmwrhtml/rr5710a1.htm). For adults and adolescents (i.e., persons aged ≥ 13 years), the surveillance case definitions for HIV infection and AIDS were revised into a single case definition for HIV infection that includes AIDS and incorporates the HIV infection staging classification system. In addition, the HIV infection case definition for children aged <13 years and the AIDS case definition for children aged 18 months to <13 years were revised. No changes were made to the HIV infection classification system, the 24 AIDS-defining conditions for children aged <13 years, or the AIDS case definition for children aged <18 months. These case definitions are intended for public health surveillance only and not as a guide for clinical diagnosis.

A confirmed case meets the laboratory criteria for diagnosis of HIV infection and one of the four HIV infection stages (stage 1, stage 2, stage 3, or stage unknown).

- **HIV infection, stage 1:** No AIDS-defining condition and either CD4+ T-lymphocyte count of ≥ 500 cells/ μ L or CD4+ T-lymphocyte percentage of total lymphocytes of ≥ 29 .
- **HIV infection, stage 2:** No AIDS-defining condition and either CD4+ T-lymphocyte count of 200–499 cells/ μ L or CD4+ T-lymphocyte percentage of total lymphocytes of 14–28.
- **HIV infection, stage 3 (AIDS):** CD4+ T-lymphocyte count of < 200 cells/ μ L or CD4+ T-lymphocyte percentage of total lymphocytes of < 14 , or documentation of an AIDS-defining condition. Documentation of an AIDS-defining condition supersedes a CD4+ T-lymphocyte count of ≥ 200 cells/ μ L and a CD4+ T-lymphocyte percentage of total lymphocytes of ≥ 14 .
- **HIV infection, stage unknown:** No information available on CD4+ T-lymphocyte count or percentage and no information available on AIDS-defining conditions.

Transmission category:

The term for summarizing the multiple risk factors that a person may have had by selecting the one most likely to have resulted in HIV transmission. For surveillance purposes, persons with more than one reported risk factor are classified in the transmission category listed first in the hierarchy and therefore counted only once. The exception is men who report sexual contact with other men and injection drug use; this group makes up a separate transmission category.

- **Male-to-male sexual contact:** Persons whose transmission category is classified as male-to-male sexual contact include men who noted sexual contact with other men (i.e., homosexual contact) and men who noted sexual contact with both men and women (i.e., bisexual contact).
- **Heterosexual contact:** Persons whose transmission category is classified as heterosexual contact are persons who noted heterosexual contact with a person known to have, or to be at high risk for, HIV infection (e.g., an injection drug user or man who has sex with men).
- **Injection drug use:** Persons whose transmission category is classified as injection drug use are persons who noted receiving an injection, either self-administered or given by another person, of a drug that was not prescribed by a physician for this person. The drug itself is not the source of the HIV infection, but rather the sharing of syringes or other injection equipment (e.g., cookers, and cottons), which can result in transmission of bloodborne pathogens, such as HIV.
- **Male-to-male sexual contact and injection drug use:** Persons whose transmission category is classified as male-to-male sexual contact and injection drug use include men who noted injecting drugs as well as sexual contact with other men or sexual contact with both men and women.

Additional Resources:

CDC-INFO
1-800-CDC-INFO (232-4636)
cdcinfo@cdc.gov
*Get answers to questions
and locate HIV testing sites.*

CDC HIV Web Site
www.cdc.gov/hiv

Locate an HIV Testing Site
www.hivtest.org

**CDC National Prevention
Information Network (NPIN)**
1-800-458-5231
www.cdcpin.org
*Technical assistance and
resources.*

AIDSInfo
1-800-448-0440
www.aidsinfo.nih.gov
Treatment and clinical trials.

AIDS.gov
www.aids.gov
*Comprehensive government
HIV resources.*