

HIV Surveillance Technical Notes

Surveillance of HIV/AIDS

The Minnesota Department of Health (MDH) collects case reports of HIV infection and AIDS diagnoses through a passive and active HIV/AIDS surveillance system. Passive surveillance relies on physicians and laboratories to report new cases of HIV infection or AIDS directly to MDH in compliance with state rules¹. Active surveillance conducted by MDH staff involves routine visits and correspondence with select HIV clinical facilities to ensure completeness of reporting and accuracy of the data.

Factors that impact the completeness and accuracy of HIV/AIDS surveillance data include: availability and targeting of HIV testing services, test-seeking behaviors of HIV-infected individuals, compliance with case reporting, and timeliness of case reporting. Certain events have also impacted trends in HIV/AIDS surveillance data. For example changes over time in the surveillance case definition (most notably the 1993 expansion of the case definition for adults and adolescents²) have resulted in artificial jumps in AIDS case counts at the time the new definition went into effect or in the preceding year because changes in case definition allowed for retrospective diagnoses. Additionally, on January 4, 2010, the U.S. travel ban on HIV+ visitors and immigrants was lifted. Persons now testing positive for the first time in Minnesota after arriving from their native country will no longer be assigned the status of 'immigrant', as compared to those who were diagnosed pre-2010 during obligatory immigrant physical examinations. Finally, an amendment to the communicable disease reporting rule was passed in June 2011, requiring the report of all CD4 and Viral Load test results.

¹ Minnesota Rule 4605.7040

² MMWR 1992;41[no.RR-17]:1-19

New HIV Diagnoses

New HIV diagnoses refer to persons who are diagnosed with HIV infection and newly reported to MDH. This includes case-patients that meet the CDC surveillance definition for AIDS at the time they are initially diagnosed with HIV infection (AIDS at first diagnosis). Cases of new HIV diagnosis are displayed by year of earliest HIV diagnosis. The number of new HIV diagnoses in Minnesota includes only persons who were first reported with HIV infection while residents of Minnesota. Persons moving to Minnesota already infected with HIV are excluded if they were previously reported in another state.

Vital Status of HIV/AIDS Cases

Persons are assumed alive unless MDH has knowledge of their death. Vital status information is updated by monthly visits to select reporting facilities, correspondence with other health departments, annual death certificate reviews, and periodic matches with the National Death Index and Social Security Death Master File. “AIDS deaths” refers to all deaths among AIDS cases regardless of the cause of death. “All deaths” refers to all deaths among HIV/AIDS cases regardless of the cause of death.

Place of Residence for HIV/AIDS Cases

Persons are assumed to be residing in Minnesota if their most recently reported state of residence was Minnesota and MDH has not received notice of relocation outside of the state. Likewise, a person’s county or city of residence is assumed to be the most recently reported value unless MDH is otherwise notified. Residence information is updated through standard case reporting, monthly visits to select reporting facilities and/or correspondence with other state health departments. Persons diagnosed with HIV infection while imprisoned in a state correctional facility are included in the data presented unless otherwise noted (federal and private prisoners are excluded). Residential relocation, including release from state prison, is difficult to track and therefore data presented by *current* residence must be interpreted in this light. Data on residence *at time of diagnosis* are considered more accurate, limited only by the accuracy of self-reported residence location.

Data Tabulation and Presentation

The data displayed are not adjusted to correct for reporting delays, case definition changes, or other factors.

MDH surveillance reports published before 2000 displayed data by year of report while subsequent reports display the data by earliest date of HIV diagnosis. The report date is a function of reporting practices and may be months or years after the date of diagnosis and the date of infection. The date of diagnosis is temporally closer to the date of infection. Displaying data by year of diagnosis more closely approximates when infection occurred. Readers should bear in mind that diagnosis date is also an approximation for infection date. Many years may pass between time of infection and diagnosis; the incubation period³ for HIV/AIDS is approximately 10 years. It should also be noted that because of delays in reporting, the annual number of cases reportedly diagnosed in recent years is slightly lower than actual. This discrepancy corrects itself over time. The number of cases diagnosed within a calendar year changes relatively little after two years have passed.

Unless otherwise noted, data analyses exclude persons diagnosed in federal or private correctional facilities (inmates generally are not Minnesota residents before incarceration and do not stay in Minnesota upon their release), infants with unknown or negative HIV status who were born to HIV positive mothers, HIV-infected refugees who resettled in Minnesota as part of the HIV-Positive Refugee Resettlement Program, and other refugees/immigrants with an HIV diagnosis prior to their arrival in Minnesota. However, refugees in the HIV-Positive Refugee Resettlement Program, as well as, other refugees/immigrants diagnosed with AIDS subsequent to their arrival in the U.S. are included in the number of new AIDS cases.

³ Incubation period is the time between initial infection with the virus and the development of disease symptoms.

Mode of Exposure Hierarchy

All state and city HIV/AIDS surveillance systems funded by the Centers for Disease Control and Prevention use a standardized hierarchy of mode of exposure categories. HIV and AIDS cases with more than one reported mode of exposure to HIV are classified in the exposure category listed first in the hierarchy. In this way, each case is counted as having only one mode of exposure. The only exception to this rule is the joint risk of male-to-male sex (MSM) and injection drug use (IDU), which makes up a separate exposure category in the hierarchy. The following is a list of the hierarchy for adolescent/adult HIV/AIDS cases:

1. MSM
2. IDU
3. MSM/IDU
4. Hemophilia patient
5. Heterosexual contact
6. Receipt of blood transfusion or tissue/organ transplant
7. Other (e.g. needle stick in a health care setting)
8. Risk not specified.

The following is the list of the hierarchy for pediatric HIV/AIDS cases:

1. Hemophilia patient
2. Mother with HIV or HIV risk
3. Receipt of blood transfusion or tissue/organ transplant
4. Other
5. Risk not specified.

Heterosexual contact is only designated if a male or female can report specific heterosexual contact with a partner who has, or is at increased risk for, HIV infection (e.g. an injection drug user). For females this includes heterosexual contact with a bisexual male (mainly due to the elevated prevalence of HIV infection among men who have sex with men).

“Risk not specified” refers to cases with no reported history of exposure to HIV through any of the routes listed in the hierarchy of exposure categories. These cases include persons who have not yet been interviewed by MDH staff; persons whose exposure history is incomplete because they died, declined to be interviewed, or were lost to follow-up; and persons who were interviewed or for whom follow-up information was available but no exposure was identified/acknowledged.

The growing number of cases with unspecified risk in recent years is, in part, artificial and due to interviews that have not yet been completed. In time, a number of these will be assigned a mode of exposure category. However, part of the observed increase is real. As stated above, a person must have intimate knowledge about his/her partner to meet the criteria for heterosexual mode of exposure. Often cases will not be certain about their partners' HIV status or risk. Additionally, the perception of social stigma presumably decreases the likelihood that a person will acknowledge certain risk behaviors, particularly male-to-male sex or injection drug use. Thus, if the *true* numbers of cases due to heterosexual contact, MSM, and/or IDU increase, a larger number of cases without a specified risk would be expected.

A study by the Centers for Disease Control and Prevention used statistical methods to redistribute risk among female HIV/AIDS cases with unspecified risk⁴. The results are helpful but are based on national data and are not necessarily applicable at the state or local level. Speculation regarding the distribution of risk behaviors among those with unspecified risk is difficult, especially in men, for who even a national study is not available.

Re-distribution of Mode of Exposure

In 2004 MDH began estimating mode of exposure for cases with unspecified risk in its annual summary slides. Each year, estimation is done by using the risk distribution for cases diagnosed in the most recent three-year period with known risk by race and gender and applying it to those with unspecified risk of the same race and gender, for example to estimate risk in 2016, we would use cases diagnosed between 2014 and 2016. For females an additional step was added to the process. If females reported sex with males but did not report injecting drug use or receipt of blood products, then she was placed in a new category named "Heterosexual – with unknown risk". The same was not done for males given the high level of stigma associated with male-to-male sex in certain communities.

When applying the proportions from those with known risk to those with unspecified risk there were two exceptions to the method, African-born cases and Asian/Pacific Islander women. For

⁴ MMWR 2001; 50(RR-6):31-40.

both African-born and Asian/Pacific Islander women a breakdown of 95% heterosexual risk and 5% other risk was used. For African-born males a breakdown of 5% male-to-male sex, 90% heterosexual risk, and 5% other risk was used. These percentages are based on epidemiological literature and/or community experience.

MSM Estimate

In 2012, MDH began estimating the population of MSM in Minnesota. This estimate generates a denominator for the most commonly reported risk factor in Minnesota and allows for the calculation of a rate of infection and rate of prevalence among those in the risk group. Estimation is done each year using the most recently available census data for men over the age of 13 and using the model by Laumann et al. where 9% of the urban population, 4% of the suburban population and 1% of the rural population are estimated to be MSM.

$$\text{MSM}_{\text{state } i} = (\text{rural pop}_{\text{state } i} \times 0.01\%) + (\text{suburban pop}_{\text{state } i} \times 0.04\%) + (\text{urban pop}_{\text{state } i} \times 0.09\%)$$

After consulting with stakeholders, it was agreed that it was appropriate to assign urban/suburban/rural designation based on the unique geography of Minnesota. The counties of Hennepin and Ramsey are assigned as urban, the counties of Anoka, Carver, Dakota, Scott and Washington along with the cities of Rochester, St. Cloud and Duluth are assigned as suburban, and the remaining areas were assigned as rural. In 2016, this method utilized 2010 census data and produced an estimate of the MSM population in Minnesota to be 92,788. Overall, this represents 4.3% of the adolescent and adult male population in Minnesota.

Definitions Related to Race/Ethnicity

When data are stratified by race, black race is broken down into African-born and African American (not African-born) based on reported country of birth.

⁵ Laumann EO, Gagnon JH, Michael RT, et al. The social organization of sexuality: sexual practices in the United States, chapter 8. Chicago: University of Chicago Press; 1994

The terms “persons of color” and “non-whites” refer to all race/ethnicity categories other than white (black, Hispanic, American Indian, and Asian/Pacific Islander).

Routine Interstate Duplicate Review (RIDR)

MDH continues to participate in RIDR. RIDR is a CDC project aimed at eliminating duplicate reports of HIV and AIDS cases among states. Each case of HIV and AIDS is assigned to the state (or states when the diagnosis of HIV and AIDS occurs in two different states) where a person was first diagnosed. RIDR was the second such de-duplication initiative by CDC. The first initiative, IDEP, looked at cases reported through December 31, 2001. RIDR is now an ongoing activity that all states are expected to undertake. CDC will release a RIDR report every 6 months which will affect the ownership of Minnesota cases. While the Surveillance staff will always inquire about previous diagnosis and will check with CDC to determine if the case has been previously reported, it is possible that cases we believe to have been initially diagnosed in Minnesota were in fact diagnosed in another state. Ongoing participation in this initiative will allow for proper attribution of incident and prevalent cases in Minnesota.

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