

State-Level Estimates of HIV Incidence, Prevalence, and Undiagnosed Infections

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CONTACT INFORMATION

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BACKGROUND

- The burden of HIV infection and health outcomes for people living with HIV vary widely across the United States.
- New methods allow for estimating HIV incidence, prevalence, and percent of undiagnosed infections using case surveillance data and CD4 test results.
- Estimating HIV outcomes with appropriate models is important to aid in the development and evaluation of HIV care, prevention, and treatment programs and for monitoring progress towards the goals of the National HIV/AIDS Strategy for the United States.

OBJECTIVES

- To assess trends in HIV incidence, prevalence, and undiagnosed infections among adults and adolescents for each state, the District of Columbia, and nationally for 2008–2014.

METHODS

- Data source:** National HIV Surveillance System.
- Study population:** Persons aged 13 years and older.
- Statistical analyses:**
 - HIV case surveillance data and the first CD4 value after diagnosis were used to estimate the distribution of delay from infection to diagnosis based on a well characterized CD4 depletion model.
 - The distribution of diagnosis delay was used to estimate HIV incidence (includes diagnosed and undiagnosed infections).
 - HIV incidence data, combined with information on cumulative numbers of diagnoses and deaths, were used to estimate HIV prevalence (persons living with diagnosed and undiagnosed infections).
 - Estimated HIV prevalence and the number of persons living with diagnosed HIV infection were used to estimate the number and percentage of undiagnosed infection.
 - Estimated annual percentage changes (EAPCs) were calculated for each outcome and considered significant if the p-value was <0.05.

Table 1. Estimated HIV incidence among persons aged ≥13 years, 2014, United States

| Area of residence | 2014 | | | Trend 2008-2014 | | | |
|----------------------|--------|--------------------------|------|-----------------|------|---------|--|
| | No. | 95% Confidence intervals | EAPC | L95 | U95 | p-value | |
| United States | 37,600 | 35,400-39,800 | -3.6 | -4.3 | -2.9 | <0.01 | |
| Alabama | 560 | 290-830 | -5.7 | -11.2 | 0 | 0.05 | |
| Alaska | 40 | 0-110 | — | — | — | — | |
| Arizona | 780 | 460-1,100 | -0.5 | -6 | 5.3 | 0.86 | |
| Arkansas | 310 | 110-520 | 3.5 | -5.5 | 13.4 | 0.46 | |
| California | 5,100 | 4,300-5,900 | -1.7 | -3.7 | 0.3 | 0.09 | |
| Colorado | 340 | 140-540 | -5.9 | -12.8 | 1.5 | 0.12 | |
| Connecticut | 260 | 80-450 | -3.3 | -11.1 | 5.1 | 0.43 | |
| Delaware | 110 | 0-220 | -3.2 | -15.6 | 11.1 | 0.65 | |
| District of Columbia | 490 | 240-750 | -10 | -14.7 | -4.9 | <0.01 | |
| Florida | 4,700 | 3,900-5,500 | -1.9 | -4 | 0.2 | 0.08 | |
| Georgia | 1,900 | 1,400-2,400 | -6.1 | -9 | -3.2 | <0.01 | |
| Hawaii | 100 | 0-210 | — | — | — | — | |
| Idaho | 10 | 0-40 | — | — | — | — | |
| Illinois | 1,200 | 820-1,600 | -4.3 | -7.9 | -0.5 | 0.03 | |
| Indiana | 420 | 190-650 | -2.8 | -9.2 | 3.9 | 0.4 | |
| Iowa | 80 | 0-170 | — | — | — | — | |
| Kansas | 90 | 0-190 | — | — | — | — | |
| Kentucky | 270 | 100-450 | -1.9 | -9.6 | 6.4 | 0.64 | |
| Louisiana | 1,100 | 690-1,400 | -1.4 | -5.9 | 3.3 | 0.54 | |
| Maine | 80 | 0-180 | — | — | — | — | |
| Maryland | 1,200 | 830-1,700 | -7.5 | -11.1 | -3.7 | <0.01 | |
| Massachusetts | 740 | 430-1,000 | -1.8 | -6.8 | 3.5 | 0.5 | |
| Michigan | 800 | 480-1,100 | -0.4 | -5.5 | 5 | 0.89 | |
| Minnesota | 280 | 100-470 | -5.6 | -12.9 | 2.3 | 0.16 | |
| Mississippi | 360 | 140-580 | -4.4 | -11.5 | 3.2 | 0.25 | |
| Missouri | 440 | 210-680 | -5.3 | -11.4 | 1.1 | 0.1 | |
| Montana | 30 | 0-80 | — | — | — | — | |
| Nebraska | 70 | 0-160 | — | — | — | — | |
| Nevada | 400 | 170-630 | -1.9 | -8.8 | 5.5 | 0.61 | |
| New Hampshire | 40 | 0-100 | — | — | — | — | |
| New Jersey | 1,100 | 680-1,400 | -3.6 | -7.9 | 0.9 | 0.11 | |
| New Mexico | 130 | 0-260 | -2 | -13.7 | 11.3 | 0.76 | |
| New York | 3,600 | 2,900-4,200 | -5.1 | -7.2 | -2.9 | <0.01 | |
| North Carolina | 1,200 | 840-1,600 | -4.9 | -8.5 | -1.2 | 0.01 | |
| North Dakota | 20 | 0-80 | — | — | — | — | |
| Ohio | 710 | 410-1,000 | -1.9 | -6.7 | 3.2 | 0.46 | |
| Oklahoma | 210 | 50-370 | -3.1 | -11.6 | 6.1 | 0.5 | |
| Oregon | 190 | 40-330 | -8.2 | -16.5 | 0.9 | 0.08 | |
| Pennsylvania | 770 | 440-1,100 | -7.3 | -11.4 | -3 | <0.01 | |
| Rhode Island | 110 | 0-240 | — | — | — | — | |
| South Carolina | 700 | 390-1,000 | -2.5 | -7.8 | 3.1 | 0.37 | |
| South Dakota | 20 | 0-80 | — | — | — | — | |
| Tennessee | 760 | 450-1,100 | -1.6 | -6.4 | 3.6 | 0.54 | |
| Texas | 4,100 | 3,400-4,900 | -2.4 | -4.6 | -0.2 | 0.03 | |
| Utah | 120 | 10-240 | -5 | -16.7 | 8.2 | 0.44 | |
| Vermont | 10 | 0-40 | — | — | — | — | |
| Virginia | 880 | 540-1,200 | -3.4 | -7.9 | 1.4 | 0.16 | |
| Washington | 380 | 170-600 | -4.1 | -10 | 2.2 | 0.2 | |
| West Virginia | 90 | 0-180 | — | — | — | — | |
| Wisconsin | 200 | 40-370 | -6.5 | -14.6 | 2.3 | 0.14 | |
| Wyoming | 0 | 0-20 | — | — | — | — | |

EAPC, estimated annual percentage change.
Note: Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. Grey: Jurisdictions with numerically unstable estimates (<100 HIV diagnoses per year).
Orange: Significant decrease in trends from 2008–2014. Blue: Significant increase in trends from 2008–2014.

Table 2. Estimated HIV prevalence among persons aged ≥13 years, 2014, United States

| Area of residence | 2014 | | | Trend 2008-2014 | | | |
|----------------------|-----------|--------------------------|------|-----------------|-----|---------|--|
| | No. | 95% Confidence intervals | EAPC | L95 | U95 | p-value | |
| United States | 1,107,700 | 1,088,500-1,127,000 | 2.4 | 2.1 | 2.6 | <0.01 | |
| Alabama | 14,700 | 12,500-17,000 | 2.3 | 0.1 | 4.6 | 0.04 | |
| Alaska | 780 | 260-1,300 | — | — | — | — | |
| Arizona | 17,400 | 15,000-19,700 | 2.8 | 0.9 | 4.8 | 0.01 | |
| Arkansas | 6,100 | 4,700-7,600 | 2.5 | -0.8 | 5.9 | 0.15 | |
| California | 199,900 | 183,100-216,700 | 2.8 | 2.1 | 3.6 | <0.01 | |
| Colorado | 12,800 | 11,000-14,600 | 2.0 | -0.1 | 4.1 | 0.07 | |
| Connecticut | 11,300 | 9,400-13,200 | 1.0 | -1.4 | 3.4 | 0.43 | |
| Delaware | 3,700 | 2,600-4,800 | 1.0 | -3.1 | 5.4 | 0.63 | |
| District of Columbia | 18,200 | 15,700-20,700 | 2.9 | 0.8 | 5.0 | 0.01 | |
| Florida | 121,300 | 114,700-127,800 | 2.5 | 1.7 | 3.3 | <0.01 | |
| Georgia | 59,800 | 51,400-60,100 | 2.8 | 1.7 | 4.0 | <0.01 | |
| Hawaii | 3,100 | 2,200-4,000 | 2.3 | — | — | — | |
| Idaho | 1,100 | 590-1,500 | — | — | — | — | |
| Illinois | 40,200 | 36,600-43,800 | 2.5 | 1.1 | 3.8 | <0.01 | |
| Indiana | 12,200 | 10,200-14,200 | 2.5 | 0.1 | 4.9 | 0.04 | |
| Iowa | 2,800 | 1,900-3,700 | — | — | — | — | |
| Kansas | 3,400 | 2,300-4,400 | — | — | — | — | |
| Kentucky | 7,700 | 6,100-9,200 | 2.7 | -0.3 | 5.7 | 0.08 | |
| Louisiana | 23,300 | 20,200-26,200 | 2.5 | 0.6 | 4.4 | 0.01 | |
| Maine | 1,700 | 980-2,400 | — | — | — | — | |
| Maryland | 37,200 | 33,600-40,900 | 2.2 | 0.8 | 3.7 | <0.01 | |
| Massachusetts | 22,400 | 19,800-25,000 | 2.4 | 0.7 | 4.2 | 0.01 | |
| Michigan | 18,200 | 15,600-20,800 | 2.9 | 0.8 | 5.1 | 0.01 | |
| Minnesota | 8,900 | 7,300-10,400 | 2.8 | 0.2 | 5.5 | 0.04 | |
| Mississippi | 10,300 | 8,400-12,100 | 1.6 | -0.9 | 4.3 | 0.21 | |
| Missouri | 13,400 | 11,400-15,500 | 2.3 | 0.1 | 4.6 | 0.04 | |
| Montana | 650 | 210-1,100 | — | — | — | — | |
| Nebraska | 2,400 | 1,500-3,200 | — | — | — | — | |
| Nevada | 10,200 | 8,400-12,000 | 2.8 | 0.3 | 5.4 | 0.03 | |
| New Hampshire | 1,400 | 800-2,000 | — | — | — | — | |
| New Jersey | 39,200 | 35,500-42,800 | 0.9 | -0.4 | 2.2 | 0.19 | |
| New Mexico | 3,700 | 2,600-4,800 | 2.3 | 1.9 | 6.8 | 0.29 | |
| New York | 145,900 | 139,200-152,600 | 1.4 | 0.7 | 2.0 | <0.01 | |
| North Carolina | 34,000 | 30,600-37,400 | 3.0 | 1.5 | 4.4 | <0.01 | |
| North Dakota | 380 | 10-760 | — | — | — | — | |
| Ohio | 22,500 | 19,800-25,200 | 2.5 | 0.8 | 4.3 | <0.01 | |
| Oklahoma | 6,400 | 4,900-7,900 | 2.2 | -1.1 | 5.6 | 0.2 | |
| Oregon | 7,300 | 5,800-8,700 | 1.7 | -1.2 | 4.6 | 0.26 | |
| Pennsylvania | 36,700 | 33,300-40,100 | 1.3 | 0.0 | 2.7 | 0.05 | |
| Rhode Island | 2,700 | 1,700-3,600 | — | — | — | — | |
| South Carolina | 19,100 | 16,600-21,600 | 2.0 | 0.2 | 4.0 | 0.03 | |
| South Dakota | 540 | 330-940 | — | — | — | — | |
| Tennessee | 19,600 | 16,400-21,600 | 2.7 | 0.8 | 4.7 | 0.01 | |
| Texas | 95,600 | 89,700-101,600 | 3.6 | 2.7 | 4.5 | <0.01 | |
| Utah | 3,000 | 2,100-4,000 | 3.1 | -1.4 | 7.9 | 0.19 | |
| Vermont | 700 | 310-1,100 | — | — | — | — | |
| Virginia | 25,100 | 22,300-27,900 | 2.6 | 0.9 | 4.2 | 0.01 | |
| Washington | 14,100 | 12,100-16,200 | 2.5 | 0.4 | 4.7 | 0.02 | |
| West Virginia | 2,100 | 1,300-2,900 | — | — | — | — | |
| Wisconsin | 7,100 | 5,600-8,600 | 2.5 | -0.6 | 5.6 | 0.11 | |
| Wyoming | 320 | 10-620 | — | — | — | — | |

Table 3. Estimated percentages of persons aged ≥13 years living with undiagnosed HIV infection, 2014, United States

| Area of residence | 2014 | | | Trend 2008-2014 | | | |
|----------------------|------|--------------------------|------|-----------------|------|---------|--|
| | % | 95% Confidence intervals | EAPC | L95 | U95 | p-value | |
| United States | 15.0 | 14.3-15.7 | -3.4 | -4.1 | -2.6 | <0.01 | |
| Alabama | 16.2 | 9.7-22.8 | -4.9 | -10.6 | 1.2 | 0.11 | |
| Alaska | 18.3 | 0.0-47.2 | — | — | — | — | |
| Arizona | 16.0 | 10.3-21.8 | -2.7 | -8.4 | 3.3 | 0.37 | |
| Arkansas | 16.1 | 6.1-26.1 | -2.7 | -12.1 | 7.8 | 0.6 | |
| California | 15.0 | 12.9-17.1 | -2.6 | -4.9 | -0.3 | 0.05 | |
| Colorado | 13.1 | 6.9-19.3 | -3.5 | -10.7 | 4.4 | 0.38 | |
| Connecticut | 11.2 | 4.1-18.4 | -2.6 | -12.5 | 8.4 | 0.63 | |
| Delaware | 14.0 | 1.3-26.8 | -3.1 | -16.4 | 12.2 | 0.67 | |
| District of Columbia | 17.2 | 11.3-23.1 | -1.6 | -7.4 | 4.5 | 0.59 | |
| Florida | 15.6 | 13.4-17.9 | -1.3 | -3.7 | 1.3 | 0.33 | |
| Georgia | 16.6 | 13.3-19.9 | -6.1 | -8.9 | -3.2 | <0.01 | |
| Hawaii | 12.0 | 0.0-25.1 | — | — | — | — | |
| Idaho | 4.4 | 0.0-24.9 | — | — | — | — | |
| Illinois | 14.2 | 10.4-18.0 | -5.0 | -8.9 | -1.0 | 0.02 | |
| Indiana | 16.6 | 9.6-23.7 | -4.2 | -10.4 | 2.5 | 0.22 | |
| Iowa | 16.3 | 1.9-30.6 | — | — | — | — | |
| Kansas | 15.1 | 1.8-28.4 | — | — | — | — | |
| Kentucky | 15.6 | 6.9-24.3 | -6.0 | -13.6 | 2.2 | 0.15 | |
| Louisiana | 19.1 | 13.5-24.7 | -5.3 | -9.4 | -1.0 | 0.02 | |
| Maine | 14.9 | 0.0-33.1 | — | — | — | — | |
| Maryland | 15.3 | 11.2-19.4 | -4.3 | -8.4 | -0.1 | 0.05 | |
| Massachusetts | 15.4 | 10.3-20.4 | -0.5 | -6.2 | 5.5 | 0.87 | |
| Michigan | 18.9 | 12.7-25.1 | -2.8 | -8.0 | 2.6 | 0.31 | |
| Minnesota | 15.7 | 8.0-23.5 | -3.7 | -11.2 | 4.5 | 0.37 | |
| Mississippi | 13.6 | 6.0-21.2 | -7.3 | -14.4 | 0.4 | 0.06 | |
| Missouri | 14.4 | 7.9-20.9 | -4.1 | -10.8 | 3.2 | 0.27 | |
| Montana | 15.6 | 0.0-45.1 | — | — | — | — | |
| Nebraska | 15.9 | 0.4-31.4 | — | — | — | — | |
| Nevada | 18.0 | 10.4-25.6 | -3.0 | -9.4 | 3.8 | 0.38 | |
| New Hampshire | 13.9 | 0. | | | | | |