Epidemiology of HIV

Definitions for HIV Epidemiology Data

The Centers for Disease Control and Prevention (CDC) generates extensive HIV surveillance data. The following explains the types of information that are routinely provided in the CDC's United States HIV surveillance reports and how the CDC utilizes these data.

- **HIV Prevalence**: The HIV prevalence is the estimated number of persons living with HIV. This estimate includes persons with diagnosed HIV plus the estimated number with undiagnosed HIV. Because the number of persons with undiagnosed HIV is an estimate, the overall HIV prevalence is an estimate. The CDC uses prevalence data to better understand the overall current status of the HIV epidemic in the United States and to estimate the total number of people who need access to HIV treatment.

- **HIV Prevalence Rate**: The HIV prevalence rate is the number of persons living with HIV per 100,000 population.

- **Persons Living with Diagnosed HIV**: The number of persons with diagnosed HIV includes all persons who have been diagnosed with HIV and are still living, regardless of when the diagnosis of HIV was made. These numbers will be smaller than the estimated HIV prevalence since it does not include persons with HIV who remain undiagnosed. These data help the CDC designate which areas and populations have the greatest need for HIV care and treatment services.

- **New HIV Diagnoses**: The new HIV diagnoses are persons who have been diagnosed with HIV during a fixed time period, typically 1 year. These individuals are newly diagnosed, but they may have acquired HIV years before the diagnosis of HIV is made. Thus, the number of persons with diagnosed HIV is not the same as the number of persons with new HIV infections (HIV incidence). Determining the number of HIV diagnoses in a 1-year period helps the CDC to roughly estimate the burden of new HIV infections.

- **HIV Incidence**: The HIV incidence represents the CDC's estimate of the number of persons who newly acquired HIV during a fixed time period, typically a 1-year time period. Because many persons with HIV are diagnosed years after their initial infection, the HIV incidence data is based on calculations performed by the CDC, with HIV diagnosis data playing an important role. The incidence estimates are used by the CDC to monitor trends in HIV transmission, including overall trends in key populations. The incidence estimates also help to inform the CDC about the effectiveness of ongoing prevention strategies.

- **HIV Incidence Rate**: The HIV incidence rate represents the number of persons who newly acquired HIV during a fixed time period (typically 1 year) per 100,000 population.
HIV Prevalence

Estimated HIV Prevalence

The estimated prevalence for the total number of persons with HIV in the United States takes into account the number with diagnosed HIV and the estimated number of persons living with undiagnosed HIV.[1,2] For year-end 2021, the CDC estimated that approximately 1.2 million people 13 years of age and older were living with HIV in the United States; the exact estimate of 1,212,400 includes 1,058,900 persons with diagnosed HIV and 153,500 with undiagnosed HIV.[2] The HIV prevalence in the United States has increased each year from 2017 to 2021 by about 20,000 people per year (Figure 1); this increase has resulted from the number of persons newly acquiring HIV outpacing the number of deaths of persons with HIV.[2] The HIV prevalence rate for persons 13 years of age and older in the United States was 432.7 per 100,000 persons, which means approximately 0.4% of the United States population aged 13 years and older are persons with HIV.[2]

HIV Prevalence by Sex and Transmission Category

At year-end 2021, the CDC estimates that among persons living with HIV in the United States—based on sex assigned at birth—78% were male and 22% were female.[2] These HIV prevalence data based on sex assigned at birth do not include specific data for transgender or gender diverse people. Among all persons with diagnosed or undiagnosed HIV infection in the United States at year-end 2021, an estimated 59% identified male-to-male sexual contact as their transmission category, 26% heterosexual contact, 10% injection drug use, and 5% identified both male-to-male sexual contact and injection drug use; most (76%) of the males acquired HIV through male-to-male sexual contact whereas most (80%) of females acquired HIV through heterosexual contact (Figure 2).[2]

HIV Prevalence by Race/Ethnicity

Among persons living with HIV (diagnosed or undiagnosed) in the United States at year-end 2021, approximately 40% were identified as Black/African American, 29% White, and 25% Hispanic/Latino.[2] It is striking to note that although persons who are Black/African American comprise approximately 13% of the United States population, they account for more than 40% of persons with HIV. At year-end 2021, the HIV prevalence rate was by far the highest among persons who are Black/African American—a rate approximately 7 times higher than in persons who are White (Figure 3).[2] These statistics clearly illustrate how the HIV epidemic is disproportionately impacting persons who are Black/African American.[2] The cause for the disproportionate HIV burden among people who are Black/African American is not entirely known, but may relate to health disparities, racism, stigma and inequities for access to HIV care and prevention.

HIV Prevalence by Age Group

In the United States at year-end 2021, the age group with the highest HIV prevalence (persons with diagnosed or undiagnosed HIV) was in persons 55 years of age and older and next highest was in persons 45-54 years of age (Figure 4).[2] These two age groups also had the highest HIV prevalence rate (persons with diagnosed or undiagnosed HIV per 100,000 population).[2] Overall, 59% of persons living with HIV (diagnosed or undiagnosed) in the United States at year-end 2021 were 45 years of age or older.[2]

HIV Prevalence by Region of Residence

In the United States, based on data for persons with diagnosed or undiagnosed HIV at year-end 2021, more persons with HIV resided in the South (567,800) than any other region.[2] Overall, at year-end 2021, 47% of persons with diagnosed or undiagnosed HIV resided in the South, 21% in the Northeast, 20% in the West, and 12% in the Midwest.[2] The HIV prevalence rate (persons with diagnosed or undiagnosed HIV per 100,000 population) by region was highest in the South and second highest in the Northeast.[2]
New HIV Diagnoses

Reporting of New HIV Diagnoses

The CDC annually provides updated information on new diagnoses of HIV in the United States.[3] Note that new HIV diagnoses describe people diagnosed with HIV during a 1-year period. Thus, new HIV diagnoses are not the same as new HIV infections (HIV incidence), since a significant proportion of persons newly diagnosed with HIV may have acquired HIV years prior to their HIV diagnosis. The rates of new HIV diagnosis are given as rates per 100,000 population. The United States data for new HIV infections typically includes all 50 states, the District of Columbia, and 6 United States dependent areas (American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, the Republic of Palau, and the U.S. Virgin Islands).

New HIV Diagnoses in United States

In the United States, for the year 2021, an estimated 35,769 persons were newly diagnosed with HIV (any stage of HIV disease). From 2017 through 2021 there was an overall decline in new HIV diagnoses of about 7%, but note that data for 2020 were significantly impacted by COVID-19 (Figure 5).[3] The overall rate of new HIV diagnosis in 2021 was 10.8 per 100,000 population.[3]

New HIV Diagnoses by Sex and Transmission Category

Persons newly diagnosed with HIV in the United States in 2021 had the following gender breakdown as reported by the CDC: 79.1% cisgender males, 18.3% cisgender females, 2.3% in transgender woman/girl, 0.2% in transgender man/boy, and 0.1% for additional gender identity.[3] The proportion of new HIV diagnoses involving cisgender males versus cisgender females has been relatively consistent during the years 2017 through 2021, with roughly a 4:1 ratio of males to females.[3] Among reported transmission category for persons newly diagnosed with HIV in 2021, an estimated 67% were male-to-male sexual contact, 23% to heterosexual contact, 6.8% to injection drug use, 4.0% to both male-to-male sexual contact and injection drug use, and less than 1% to other transmission categories (Figure 6).[3]

New HIV Diagnosis by Race/Ethnicity

Among persons diagnosed with HIV in 2021 in the United States, more than 90% self-identified as one of three racial/ethnic groups: 41% as Black/African American individuals, 28% as Hispanic/Latino individuals, and 25% as White individuals.[3] The number and rate of new HIV diagnoses in 2021 was highest in persons who are Black/African American individuals was approximately 2 times higher than in Hispanic persons and 8 times higher than in White persons (Figure 7).[3]

New HIV Diagnoses by Age

Comparing the number of new HIV diagnoses by age categories, the highest number of new HIV diagnoses in 2021 occurred in persons 25-29 years of age followed by those 30-34 years of age (Figure 8).[3] The new diagnosis rate (new HIV diagnosis per 100,000 population) was highest in persons aged 25-29 (30.0 per 100,000 population).[3]

New HIV Diagnoses by Region

Overall, approximately 52% of reported new HIV diagnoses in the United States in 2021 occurred in persons with residence in the South at the time of HIV diagnosis.[3] The rate of new HIV diagnoses was also highest in the South (14.7), followed by the West (9.2), the Northeast (9.9), and the Midwest (7.0).[3]
Undiagnosed HIV

Undiagnosed HIV in the United States

Using back-calculation methods for year-end 2021, the CDC estimated roughly 1 in 8 (12.7%) of all people living with HIV in the United States were not aware of their HIV diagnosis.[2] From 2003 to 2015 the percentage of persons with undiagnosed HIV in the United States declined from approximately 25% to 15%. Since 2015, the undiagnosed fraction of persons with HIV has continued to decline, although a slower rate (Figure 9).[1,2,4,5] Persons unaware of their HIV status are unable to benefit from treatment of HIV and are more likely to transmit HIV to others if they are not receiving antiretroviral therapy.[6]

Undiagnosed HIV by Age, Race/Ethnicity, and TRANSMISSION CATEGORY

In general, having undiagnosed HIV correlates with age—estimates from 2021 show the younger the age group, the higher the percentage of undiagnosed HIV (Figure 10).[2] The percentage of persons with undiagnosed HIV varies among different racial/ethnic groups, with the highest undiagnosed fraction in persons who identify as American Indian/Alaska Native or Hawaiian/Pacific Islander and lowest in those who identify as Multiracial or White.[2] Among transmission categories, the undiagnosed HIV fraction was highest in persons who reported male-to-male sexual contact (14.2%) and lowest in persons with injection drug use (7.8%).[2]

Undiagnosed HIV and Risk of Transmission

Studies have shown that a large proportion of HIV transmissions occur from persons with HIV who are not yet aware of their HIV status.[6,7,8,9] Data from 2016 showed an estimated 37% of new HIV infections were attributed to the 14% of individuals who were unaware of their infection at that time.[6] Several studies have also shown that high-risk sexual behaviors and the prevalence of sexually transmitted infections decreases among persons who become aware their HIV diagnosis.[10,11,12,13] Persons who become aware of their HIV engage in care, and take antiretroviral therapy will dramatically lower their risk of transmitting HIV to others.[6,14,15]

Late Diagnosis of HIV

Unfortunately, despite improvement in HIV screening and knowledge of status, 21% of persons newly diagnosed with HIV in 2016 had stage 3 HIV disease (AIDS) at the time of the HIV diagnosis.[16] For these individuals, late diagnosis represents missed opportunities to obtain medical care that would improve health outcomes and lower the risk of HIV transmission to others. The rates of AIDS at diagnosis increases with age, but does not differ significantly by racial/ethnic groups.[16] Even among individuals who do not meet criteria for late diagnosis of HIV, there is still a need for overall earlier diagnosis.

Awareness of HIV Status and HIV Care Cascade

Increasing awareness of HIV status represents the first step in improving the HIV care cascade, also called the HIV care continuum, which is a model for identifying issues and opportunities related to the delivery of HIV services to people with HIV in the United States.[17,18] Early HIV diagnosis and prompt linkage to care, retention in care, and receipt of effective antiretroviral therapy are all essential in reducing morbidity and mortality, minimizing disparities in care and treatment, and lowering the risk of HIV transmission to others.[6,9,18,19]
HIV Incidence Estimates

Definition of HIV Incidence

The HIV incidence in the United States represents new HIV infections during a specific time period and data for incidence are typically reported as the number of new HIV infection in a 1-year period. The HIV incidence rate is the number of new cases per 100,000 population per year. Note that the yearly CDC surveillance statistics reporting of new HIV diagnoses is not the same as HIV incidence estimates. Persons who are newly diagnosed with HIV could have acquired HIV a long time ago and may not represent true new infections. In contrast, the HIV incidence for a specific year is meant to truly estimate the number of persons who recently acquired HIV.

CDC Method for Estimating HIV Incidence

The CDC estimates HIV incidence in the United States primarily based on the approach of the Serological Testing Algorithm for Recent HIV Seroconversion (STARHS), a laboratory process that can identify persons with recent HIV infection.[20] The STARHS is a two-step serologic process (Figure 11).[20]

- **Step 1:** The first step consists of a conventional HIV enzyme-linked immunoassay (EIA). This test typically becomes reactive approximately 1 months after HIV acquisition.
- **Step 2:** In the second step, samples reactive with the conventional EIA are then tested with the BED HIV-1 Capture Immunoassay. The BED capture assay uses peptides as antigens in the assay that are derived from the immunodominant region of HIV gp41. The name BED refers to HIV-1 subtypes B, E, and D. The BED assay determines the ratio of HIV-specific IgG antibodies to overall IgG antibodies in the sample (HIV IgG:Total IgG). The BED capture assay typically becomes positive approximately 6 months after HIV acquisition and approximately 5 months after the conventional HIV EIA becomes positive.

Samples from persons with chronic HIV will be reactive with both the conventional EIA and the BED capture assay. If the sample is reactive with the conventional EIA, but nonreactive with the BED capture assay, then it can be assumed the HIV infection occurred recently, likely within the prior 6 months; this situation is categorized as recent infection and also referred to as “STARHS reactive”. The CDC analyzes STARHS testing data combined with epidemiology data using complex statistical models to generate HIV incidence estimates for the entire United States.[20]

Estimates of HIV Incidence in the United States

Based on CDC incidence estimates, the number of new HIV infections in the United States has decreased in recent years from 36,500 in 2017 to 32,100 in 2021 (Figure 12).[2] Overall, five major trends in HIV incidence have occurred in the United States since the onset of the HIV epidemic: (1) a dramatic rise in the early 1980s, (2) a peak in the mid-1980s, (3) a marked decline in the late 1980s, (4) stabilization and leveling off in the 1990s, and (5) a gradual decline in new infections from 2007 to 2021.[21,22,23,24,25,26]

HIV Incidence by Sex and Transmission Category

Among the estimated new HIV infections in persons aged 13 years and older in the United States in 2021, an estimated 81% occurred in males and 19% in females.[2] For the reported transmission categories for new HIV infections in 2021, an estimated 66% were male-to-male sexual contact, 22% to heterosexual contact, 8% to injection drug use, and 4.0% to both male-to-male sexual contact and injection drug use (Figure 13).[2]

HIV Incidence by Race/Ethnicity

Of the persons 13 years of age and older in the United States with newly acquired HIV infection in 2021, an
estimated 41% were Black/African American persons, 29% Hispanic/Latino persons, 26% White persons, and fewer than 2% in each of the other racial/ethnic groups (Figure 14).[2] The HIV incidence rate (new HIV infections per 100,000 population) was by far highest in Black/African American persons and second highest in Hispanic/Latino persons; the new incidence rates for Black/African American individuals was nearly 8 times higher than White persons (37.3 versus 4.8).[2]

**HIV Incidence by Age**

In 2021, the number of new HIV infections among persons 13 years of age and older in the United States was highest in the age group 25-34 years, followed next by those 13-24 years old (Figure 15).[2] The new diagnosis rate (new HIV diagnosis per 100,000 population) was also highest in persons aged 25-34 years of age.[2]

**HIV Incidence by Region**

The number of new HIV infections in the United States in 2021 among persons 13 years of age and older in 2021 was by far the highest in the South, accounting for an estimated 52% of new HIV infections.[2] Also, the highest incidence rate (new HIV infections per 100,000 population) was highest in the South (15.6), followed by the West (10.0), the Northeast (9.0), and with the lowest rates in the Midwest (7.6).[2]
Social Determinants of Health and HIV

Role of Social Determinants of Health in the HIV Epidemic

Social determinants of health play an important role in driving the HIV epidemic in the United States. The term “social determinants of health” refers to the overlapping social, cultural, environmental, and economic factors that are responsible for most health inequities; in the case of HIV, examining such factors can help to explain the disproportionate burden of HIV in certain populations, such as in African Americans.[27] Some examples of social determinants of health are safe housing, access to health care services, transportation options, quality of education, literacy, culture, and access to job opportunities. Importantly, many socioeconomic variables, such as income, education, and occupation, will indirectly impact health and therefore serve as proxies for other determinants of health, which may not always be exactly clear.[28,29] Analyzing data for key social determinants of health in populations with HIV could inform strategies related to HIV testing, treatment, and prevention.

CDC Report on Social Determinants of Health and HIV

The CDC has identified significant gaps in knowledge regarding the relationship between social determinants of health and HIV, and to this end, the CDC released a report based on data collected from 2009 to 2013 that summarizes numbers and rates of HIV diagnoses among adults according to five social determinants of health: federal poverty level, education level, median household income, employment status, and health insurance coverage status.[27] Although the intersection of social determinants of health and individual-level factors, such as race/ethnicity, is complex, the CDC report suggests the rate of HIV diagnosis increases as the rate of poverty, unemployment, and lack of health insurance increases, and is highest in areas with lower median household income and lower educational attainment.[27] Notably, for both men and women, the HIV diagnosis rates decreased as the median household income increased.[27] Such indicators underscore that HIV risk is informed by a confluence of factors that go beyond individual-level attributes and have population-level consequences.
Deaths in Persons with HIV

Deaths of Persons Diagnosed with HIV or AIDS

With the availability of potent combination antiretroviral therapy in the mid-1990s, the annual number of deaths in persons with HIV in the United States dramatically decreased.[25,30,31] More recently, during 2017 to 2021 the annual number of deaths of persons diagnosed with HIV has increased (Figure 16), but note these are reported for persons with HIV (with or without AIDS) who die from any cause.[3] The higher number of deaths in persons with HIV in recent years likely reflects the overall aging population of persons with HIV in the United States. Indeed, among the 19,623 deaths in persons with HIV in 2021, approximately 73% occurred in persons 50 years of age and older, and presumably, most of these deaths were not directly caused by HIV.[3] Disparities in the overall HIV epidemic extend to deaths—the total number of deaths and death rates in 2022 were highest among Black/African American individuals—they accounted for 43% of all deaths in persons with diagnosed HIV.[3]

Causes of Death

For persons diagnosed with HIV who take effective antiretroviral therapy, significantly more than 50% of deaths are now due to non-AIDS causes.[32,33,34] The cause and frequency of death was analyzed in the Data Collection on Adverse Events of Anti-HIV Drugs (D:A:D) study, a collaborative, observational study that prospectively followed 23,441 persons with HIV for 5 years in Europe, the United States, and Australia; all patients enrolled had access to combination antiretroviral therapy.[35] In this study, liver disease was the most frequent non-AIDS-related cause (14.5%); other causes of death included cardiovascular disease (11%) and non-AIDS malignancies (9.4%). More recent data from the Antiretroviral Therapy Cohort Collaboration (ART-CC) found that among persons with HIV in North America and Europe who started combination antiretroviral therapy during 1996 through 1999 and survived for more than 10 years, the leading causes of non-AIDS-related deaths were malignancy, cardiovascular disease, and liver-related causes.[34]
**Global HIV Epidemiology**

**HIV-1 Groups and Subtypes (Clades)**

Strains of HIV-1 can be classified into four groups: the “major” group M, the “outlier” group O, and two additional groups, N and P (Figure 17).[36] Group M, which is responsible for most of the global HIV pandemic, has at least nine distinct subtypes (clades) of genetically-related HIV. Group N, O, and P are uncommon and have been found in Africa. Among the nine HIV-1 group M subtypes, three are responsible for most HIV infections globally: subtype A (common in Western Africa, Central Africa, and Russia), subtype B (common in Europe, the Americas, Australia, and Japan), and subtype C (common in Southern Africa, Eastern Africa, India, and Nepal). Viral subtypes can mix genetic material and create a hybrid virus and, if the recombinant virus is capable of transmission, it is designated as a “circulating recombinant form”. As an example, the circulating recombinant form created from subtypes B and F has been designated circulating recombinant form B/F.

**HIV Global Prevalence**

In the year 2022, there were 39 million people living with HIV globally, including 37.5 million adults (persons 15 years of age and older) and 1.5 million children (younger than 15 years of age) (Figure 18).[37] More than 25 million (approximately 66% of the total) were in sub-Saharan Africa, including 20.8 million in Eastern and Southern Africa and 4.8 million in Western and Central Africa.[37] Outside of Africa, the Asia/Pacific region has the next highest number of persons living with HIV (6.5 million).[37]

**HIV Global Incidence**

Based on the UNAIDS data, an estimated 1.3 million new HIV infections occurred globally in 2022 (Figure 19), which represented a 43% decline from the 2.3 million new infections globally in 2012.[37,38] The Eastern and Southern Africa region has led the HIV incidence decline in recent years, with a 69% decline in new infections from 2012 to 2022 (1.6 million to 500,000).[37,38]

**Global Antiretroviral Therapy Coverage**

During 2022, an estimated 29.8 million persons with HIV globally were taking antiretroviral therapy, which is approximately 76% of all people living with HIV globally; this represents a substantial ramp up from the 7.7 million persons receiving antiretroviral therapy in 2010 and a dramatic increase from the 1.9 million receiving antiretroviral therapy in 2005 (Figure 20).[37,39]

**Global AIDS-Related Deaths**

In 2022, there were an estimated 630,000 AIDS-related deaths globally, including 260,000 in the Eastern and Southern Africa region and 120,000 in the Asia and Pacific region (Figure 21).[37,40] Overall, AIDS-related deaths have fallen by approximately 69% since 2004 (2 million) and by 51% since 2010 (1.3 million).[37] The global decline in AIDS-related deaths has been attributed to the expanded availability and use of antiretroviral therapy in many regions of the world.[37,41]
HIV-2

HIV-2 on a Global Scale

Of the estimated 39 million individuals with HIV worldwide in 2022, approximately 1-2 million have HIV-2.[42,43] Most persons with HIV-2 reside in West Africa, or in countries, particularly France, Spain, and Portugal, after migrating from West Africa.[42] In addition, HIV-2 has been reported in several former Portuguese colonies, including Angola, Mozambique, and the Indian states of Goa and Maharashtra. Since 1996, HIV-2 prevalence has declined in several West African countries.[42]

HIV-2 in the United States

Fewer than 1% of persons diagnosed with HIV in the United States are diagnosed with HIV-2.[44,45] The number of persons with HIV-2 reported to the CDC between 1988 and June 2010 was 242, though only 166 met the CDC’s strict working case definition.[45] A follow-up study reported that from 2010 through 2017 there were 198 reported diagnoses of HIV-2 in the United States, of which 102 were HIV-2 monoinfection, 11 were dual HIV-1 and HIV-2 infections, and 85 probable (unconfirmed) HIV-2 infection.[44] The 198 diagnoses of HIV-2 corresponded to only 0.6% of all new diagnoses of HIV in the United States during this time period.[44] Among those diagnosed with HIV, 45% had a birth country listed that is known to be endemic for HIV-2.[44] Among persons with a new diagnosis of HIV-2 reported to the CDC from 2010 through 2017, approximately 55% resided in the Northeast and 31% in the South.[44]
Summary Points

- In the United States at year-end of 2021, approximately 1.2 million people were living with HIV (diagnosed and undiagnosed) in the United States.
- The number of people with HIV (diagnosed or undiagnosed) in the United States has steadily increased as the number of new infections per year has outpaced the number of people dying with HIV.
- Key 2021 HIV prevalence data in the United States include the following: 59% of persons with HIV had male-to-male sex as their transmission category, Black individuals accounted for approximately 40% of all people with HIV, and 59% of persons with HIV were 45 years of age or older.
- There were 35,769 persons newly diagnosed with HIV in 2021 in the United States, and this number has deceased since 2017.
- Key 2021 data for new HIV diagnoses were 79% were male, 66% acquired HIV via male-to-male sex, 43% were Black individuals, and 46% resided in the South at the time of the diagnosis.
- In 2021, roughly 1 out of every 8 people living with HIV in the United States were unaware of their HIV diagnosis. The highest proportion of persons with HIV in the United States who are unaware of their HIV status are persons aged 13 to 24 years of age.
- The CDC estimates there were 32,000 new HIV infections in the United States in 2021. In recent years the annual number of new HIV infections in the United States has declined.
- In the United States in 2021, there were almost 20,000 deaths in persons diagnosed with HIV. This number represents deaths from any cause and most deaths now in persons with HIV are occurring in older persons and are not directly caused by HIV. The highest number of deaths occurred among Blacks/African American individuals.
- Globally, an estimated 39 million people were living with HIV in 2002, and there were an estimated 1.3 million new HIV infections in 2022. In 2022, an estimated 30& million persons with HIV globally were receiving antiretroviral therapy.
- Globally, an estimated 1 to 2 million persons are living with HIV-2, with the highest prevalence rates in West Africa. In the United States, HIV-2 accounts for fewer than 1% of all people with HIV.
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Figures

Figure 1 Persons with Diagnosed or Undiagnosed HIV in the United States in United States, 2017-2021

Estimates for persons ≥13 years of age and older

Figure 2A: Persons with Diagnosed and Undiagnosed HIV in the United States, HIV Transmission Categories, 2021

Estimates for persons ≥13 years of age and older

*Other = perinatal, hemophilia, blood transfusion, and risk factor not reported or identified

Figure 2 (Image Series) - HIV Prevalence by Transmission Categories, 2021
Image 2B: Males with Diagnosed and Undiagnosed HIV in the United States, HIV Transmission Categories, 2021

Estimates for persons ≥13 years of age and older
*Other = perinatal, hemophilia, blood transfusion, and risk factor not reported or identified

Figure 2 (Image Series) - HIV Prevalence by Transmission Categories, 2021

Image 2C: Females with Diagnosed and Undiagnosed HIV in the United States, HIV Transmission Categories, 2021

Estimates for persons ≥13 years of age and older

Figure 3 HIV Prevalence Rates, by Race/Ethnicity, United States, 2021

Estimates for persons ≥13 years of age and older

Figure 4 Persons with Diagnosed or Undiagnosed HIV, by Age Categories, United States 2021

Estimates for persons ≥13 years of age and older

Figure 5 New HIV Diagnoses, United States, 2017-2021

Figure 6 (Image Series) - New HIV Diagnoses in Adults and Adolescents, by Transmission Category, 2021

Image 6A: New HIV Diagnoses in Adults and Adolescents, by Transmission Category, 2021

*Other = perinatal, hemophilia, blood transfusion, and risk factor not reported or identified.

Figure 6 (Image Series) - New HIV Diagnoses in Adults and Adolescents, by Transmission Category, 2021
Image 6B: Males with New HIV Diagnosis, by Transmission Category, 2021

Figure 6 (Image Series) - New HIV Diagnoses in Adults and Adolescents, by Transmission Category, 2021
Image 6C: Females with New HIV Diagnosis, by Transmission Category, 2021

Figure 7 New HIV Diagnoses (Rate) in the United States in 2021, by Race/Ethnicity

Figure 8 New HIV Diagnoses in the United States in 2021, by Age Group

Figure 9 Proportion of Persons with Undiagnosed HIV in the United States, 2015-2021

Figure 10 Proportion of Persons with Undiagnosed HIV in the United States in 2021, by Age Group

Figure 11 Serological Testing Algorithm for Recent HIV Seroconversion (STARHS)

This algorithm uses both a conventional HIV enzyme immunoassay (EIA) and HIV BED immunoassay. The BED assay is based on the ratio of HIV Ig antibodies to total Ig antibodies.

Figure 12 Estimated HIV Incidence in United States, 2017-2021

Investigators from the Centers for Disease Control and Prevention incorporated data from the HIV case surveillance system and CD4 cell count test results to estimate the HIV incidence in the United States.

Figure 13 Estimated HIV Incidence in Persons Aged ≥13 Years, in United States, by Transmission Category, 2021

Figure 14 Estimated HIV Incidence in Persons Aged ≥13 Years, in United States, by Race/Ethnicity, 2021

Figure 15 Estimated HIV Incidence in United States, by Age Group, 2021

Figure 16 Annual Deaths in Persons with Diagnosed HIV, by Year—United States, 2017-2021

Figure 17 HIV-1-Groups

Strains of HIV-1 can be classified into four groups: the "major" group M, the "outlier" group O, and two additional groups, N and P. The M group comprises at least 9 distinct HIV subtypes.

### Figure 18 Global HIV Prevalence by Region, 2022

Source: UNAIDS. Fact Sheet 2023.

<table>
<thead>
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<th>Region</th>
<th>People Living with HIV</th>
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<tbody>
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<td><strong>Global Total</strong></td>
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<td>Eastern Europe and Central Asia</td>
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<td>Western and Central Europe and North America</td>
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**Figure 19 Global HIV Incidence by Region, 2022**

Source: UNAIDS. Fact Sheet 2023.

<table>
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<tr>
<td>Middle East and North Africa</td>
<td>17,000</td>
</tr>
<tr>
<td>Asia and the Pacific</td>
<td>300,000</td>
</tr>
<tr>
<td>Latin America</td>
<td>110,000</td>
</tr>
<tr>
<td>The Caribbean</td>
<td>16,000</td>
</tr>
<tr>
<td>Eastern Europe and Central Asia</td>
<td>160,000</td>
</tr>
<tr>
<td>Western and Central Europe and North America</td>
<td>58,000</td>
</tr>
</tbody>
</table>
Figure 20 Persons with HIV on Antiretroviral Therapy—Global, 1999-2022

**Figure 21 Global Deaths Due to AIDS During 2022**

Source: UNAIDS. Fact Sheet 2022.

<table>
<thead>
<tr>
<th>Region</th>
<th>AIDS-Related Deaths</th>
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<tbody>
<tr>
<td>Global Total</td>
<td>630,000</td>
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<tr>
<td>Eastern and Southern Africa</td>
<td>260,000</td>
</tr>
<tr>
<td>Western and Central Africa</td>
<td>120,000</td>
</tr>
<tr>
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<td>5,300</td>
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<tr>
<td>Asia and the Pacific</td>
<td>150,000</td>
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<tr>
<td>Latin America</td>
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<tr>
<td>The Caribbean</td>
<td>5,600</td>
</tr>
<tr>
<td>Eastern Europe and Central Asia</td>
<td>48,000</td>
</tr>
<tr>
<td>Western and Central Europe and North America</td>
<td>13,000</td>
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</tbody>
</table>