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Epidemiology of HIV

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Module 1: Screening and Diagnosis
Lesson 1: Epidemiology of HIV

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Definitions for HIV Epidemiology Data

The Centers for Disease Control and Prevention (CDC) generates extensive HIV surveillance data. The following explains the information that is 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 HIV diagnosis 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 that areas and populations that 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 diagnosed with 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 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 CDC uses incidence estimates 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 included 1,058,900 persons with diagnosed HIV and 153,500 with undiagnosed HIV.[2] The HIV prevalence in the United States has increased yearly 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 2021 HIV prevalence rate for persons 13 years of age and older in the United States was 432.7 per 100,000 persons, meaning an estimated 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 estimated that among persons living with HIV in the United States, 78% were male and 22% were female.[2] 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% identified heterosexual contact, 10% identified 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 the 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% 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]

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 persons 55 years of age and older and the 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 United States Region of Residence

Based on data for persons with diagnosed or undiagnosed HIV at year-end 2021 in the United States, more persons with HIV resided in the South (567,800) than any other region.[2] Overall, 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) was also 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 diagnoses 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 diagnoses 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 breakdown by sex as reported by the CDC: 79.1% males and 18.3% females, and 2.6% other.[3] The proportion of new HIV diagnoses involving males versus females has been relatively consistent during the years 2017 through 2021, with roughly a 4:1 ratio of males to females.[3] Among the reported transmission categories for persons newly diagnosed with HIV in 2021, an estimated 67% were male-to-male sexual contact, 23% were heterosexual contact, 6.8% were injection drug use, 4.0% were both male-to-male sexual contact and injection drug use, and less than 1% were 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 Black/African American individuals—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 at a slower rate (Figure 9).[1,2,4,5] Persons unaware of their HIV status are unable to benefit from HIV treatment 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 the 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 the prevalence of sexually transmitted infections decreases among persons who become aware of 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]

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.[16,17] Early HIV diagnosis and prompt linkage to care, retention in care, and receipt of effective antiretroviral therapy are all essential in reducing HIV-related morbidity and mortality, as well as lowering the risk of HIV transmission to others.[6,9,17,18]

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 infections 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 estimate the true number of persons who recently acquired HIV. 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 two-step serologic laboratory process that can identify persons with recent HIV infection.[19]

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 11).[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.[20,21,22,23,24,25]

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 attributed to 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 12).[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 13).[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; this incidence rate for Black/African American individuals was nearly 8 times higher than for 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 14).[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), then the Northeast (9.0), and with the lowest rates in the Midwest (7.6).[2]

Factors Related to Health and HIV

Factors that Impact HIV Rates

Multiple overlapping factors, including social, cultural, environmental, and economic factors impact community and regional HIV rates. The CDC has released a report based on data collected from 2009 to 2013 that summarizes numbers and rates of HIV diagnoses among adults according to five factors: federal poverty level, education level, median household income, employment status, and health insurance coverage status.[26] Although the intersection of these factors and HIV acquisition 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.[26] Notably, for both men and women, the HIV diagnosis rates decreased as the median household income increased.[26] 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.[24,27,28] More recently, during the period 2017 to 2021 the annual number of deaths of persons diagnosed with HIV has increased (Figure 15), 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 2021 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.[29,30,31] The causes and frequency of death were 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.[32] 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 in 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.[31]

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 16).[33] Group M, which is responsible for most of the global HIV pandemic, has at least nine distinct subtypes (clades) of genetically related HIV. Groups 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 17).[34] More than 25 million living with HIV reside in sub-Saharan Africa, including 20.8 million in Eastern and Southern Africa and 4.8 million in Western and Central Africa.[34] Outside of Africa, the Asia/Pacific region has the next highest number of persons living with HIV (6.5 million).[34]

HIV Global Incidence

Based on the UNAIDS data, an estimated 1.3 million new HIV infections occurred globally in 2022 (Figure 18), which represented a 43% decline from the 2.3 million new infections globally in 2012.[34,35] 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).[34,35]

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 19).[34,36]

Global AIDS-Related Deaths

In 2022, there were an estimated 630,000 AIDS-related deaths globally, including 260,000 in the UNAIDS Eastern and Southern Africa region and 120,000 in the Asia and the Pacific region (Figure 20).[34,37] Overall, AIDS-related deaths have fallen by approximately 69% since 2004 (2 million) and by 51% since 2010 (1.3 million).[34] 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.[34,38]

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.[39,40] Most persons with HIV-2 reside in West Africa, or in countries, particularly France, Spain, and Portugal, after migrating from West Africa.[39] 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.[39]

HIV-2 in the United States

Fewer than 1% of persons diagnosed with HIV in the United States are diagnosed with HIV-2.[41,42] 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.[42] 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 were probable (unconfirmed) HIV-2 monoinfection.[41] 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.[41] Among those diagnosed with HIV, 45% had a birth country listed that is known to be endemic for HIV-2.[41] 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.[41]

Summary Points

- In the United States, at year-end 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 sexual contact as their transmission category, approximately 40% of all people with HIV are Black individuals, 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 decreased since 2017.
- Key 2021 data for new HIV diagnoses indicated that 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 reported an estimated 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 now most deaths in persons with HIV are occurring in older persons and are not directly caused by HIV. The highest number of deaths occurred among Black/African American individuals.
- Globally, an estimated 39 million people were living with HIV in 2022, 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, United States, 2017-2021

Estimates for persons ≥13 years of age and older

Source: Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2017–2021. HIV Surveillance Supplemental Report. 2023;28(3). Published May 2023.

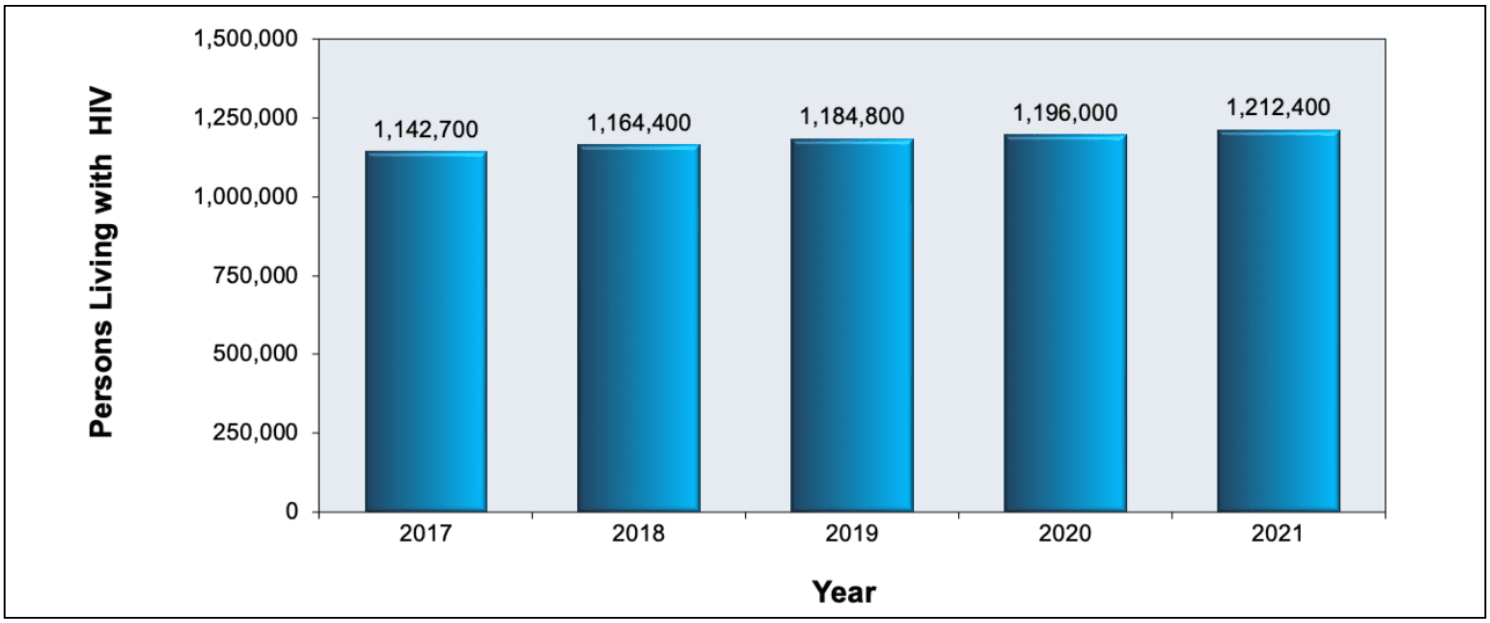


Figure 2 (Image Series) - HIV Prevalence by Transmission Categories, United States, 2021 (Image Series) - Figure 2 (Image Series) - HIV Prevalence by Transmission Categories, United States, 2021
Image 2A: Persons with Diagnosed and Undiagnosed HIV, by HIV Transmission Categories, United States, 2021

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

Source: Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2017–2021. HIV Surveillance Supplemental Report. 2023;28(3). Published May 2023.

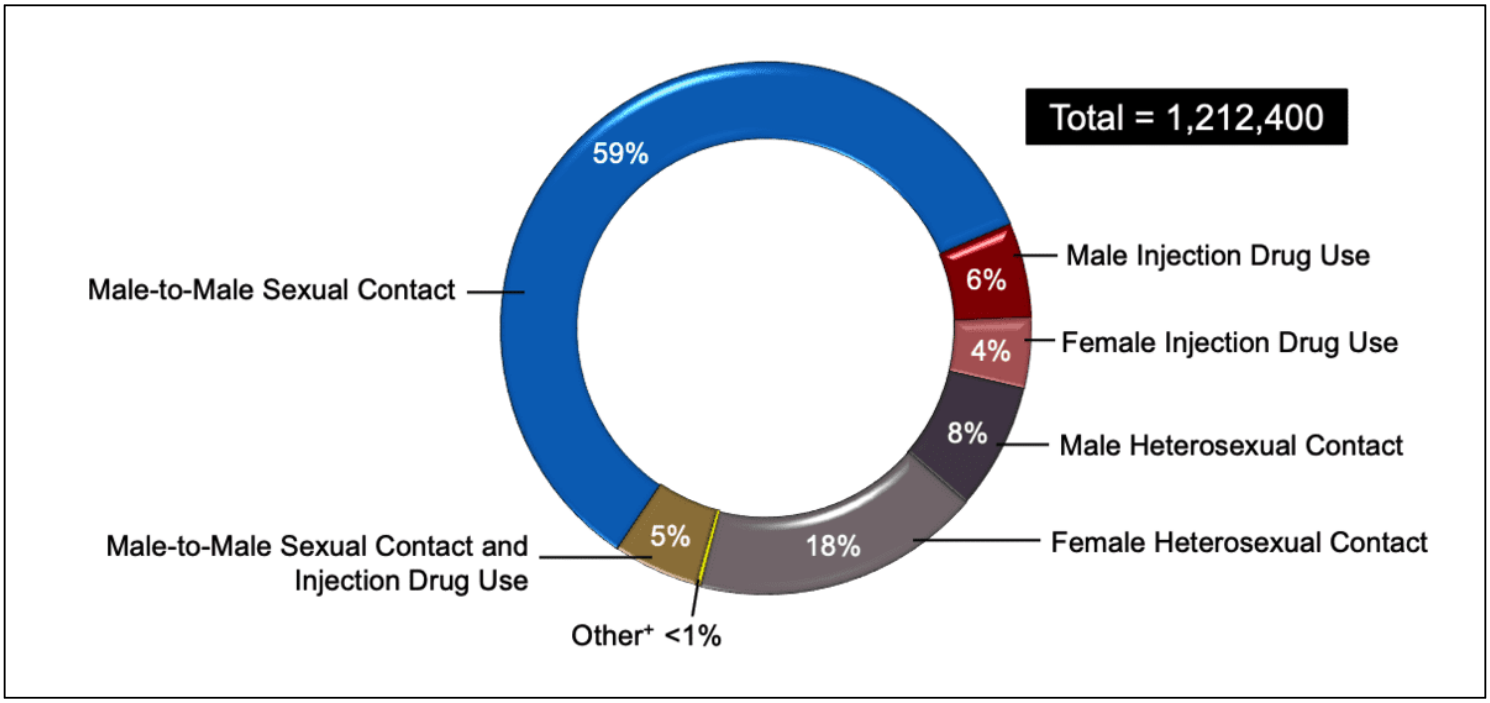


Figure 2 (Image Series) - HIV Prevalence by Transmission Categories, United States, 2021
Image 2B: Males with Diagnosed and Undiagnosed HIV, by Transmission Categories, United States, 2021

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

Source: Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2017–2021. HIV Surveillance Supplemental Report. 2023;28(3). Published May 2023.

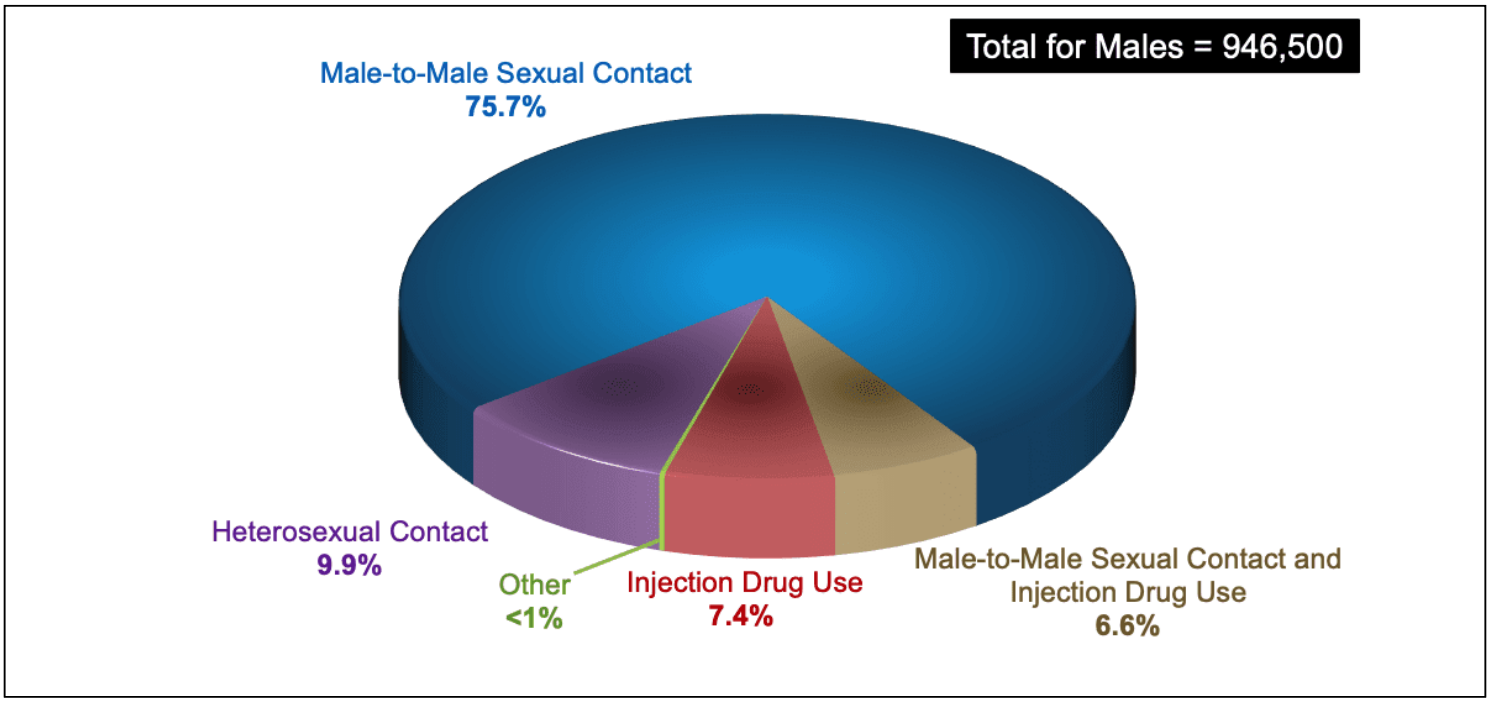


Figure 2 (Image Series) - HIV Prevalence by Transmission Categories, United States, 2021
Image 2C: Females with Diagnosed and Undiagnosed HIV, by Transmission Categories, United States, 2021

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

Source: Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2017–2021. HIV Surveillance Supplemental Report. 2023;28(3). Published May 2023.

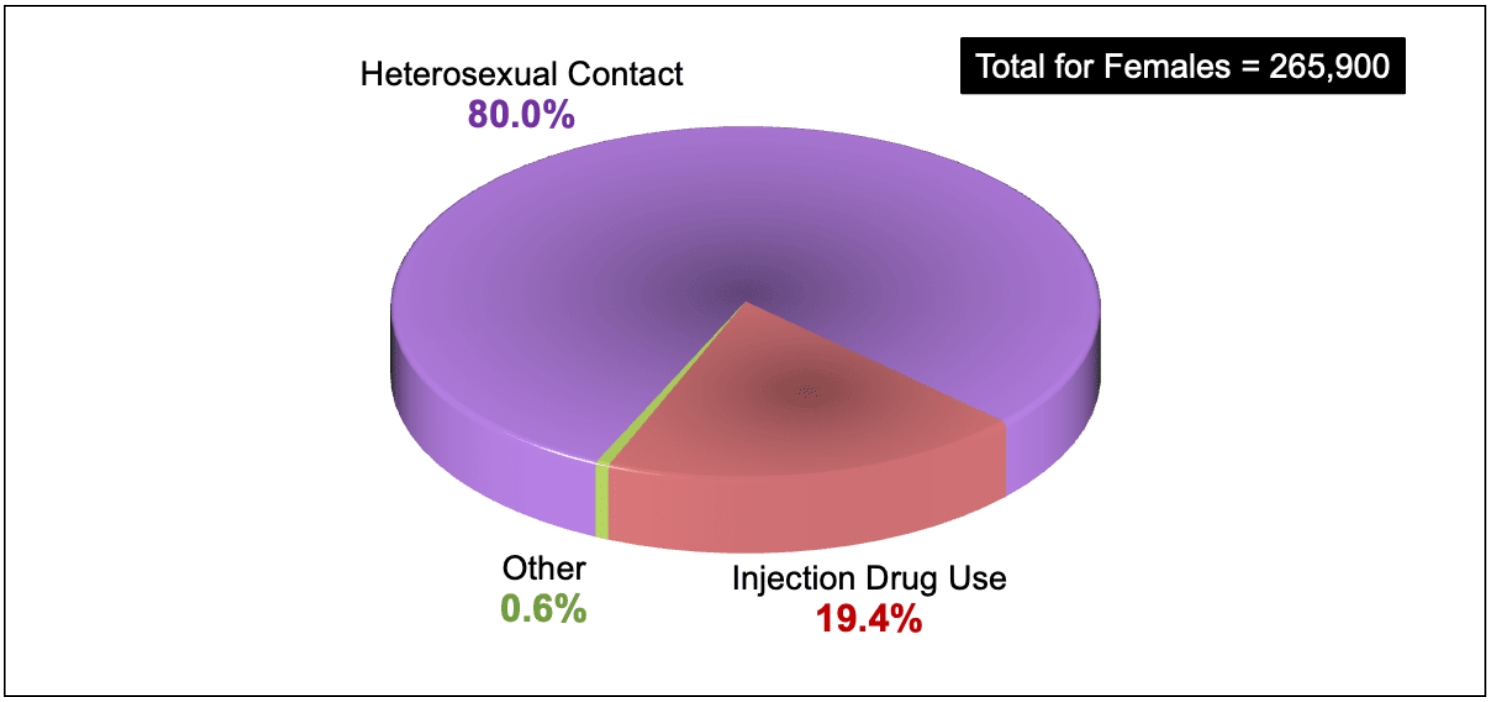


Figure 3 HIV Prevalence Rates, by Race/Ethnicity, United States, 2021

Estimates for persons ≥13 years of age and older

Source: Source: Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2017–2021. HIV Surveillance Supplemental Report. 2023;28(3). Published May 2023.

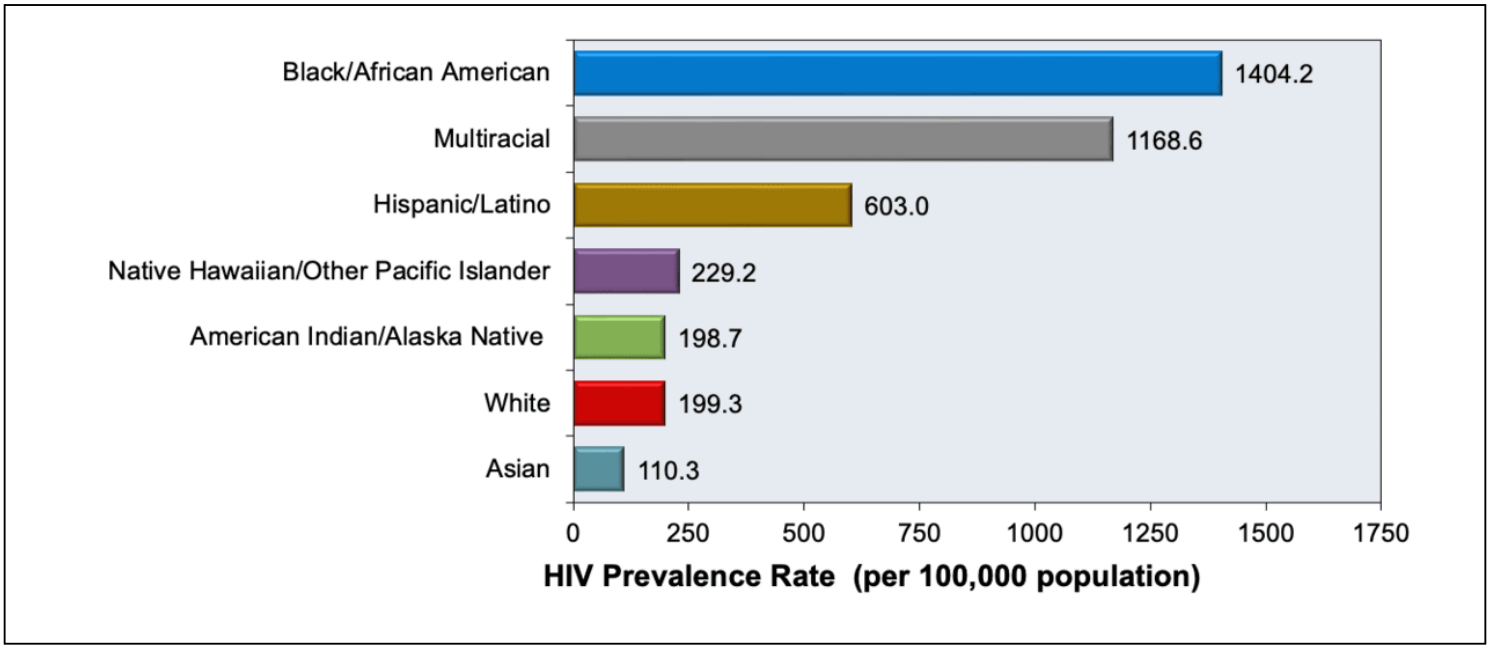


Figure 4 Persons with Diagnosed or Undiagnosed HIV, by Age Categories, United States, 2021

Estimates for persons ≥13 years of age and older

Source: Source: Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2017–2021. HIV Surveillance Supplemental Report. 2023;28(3). Published May 2023.

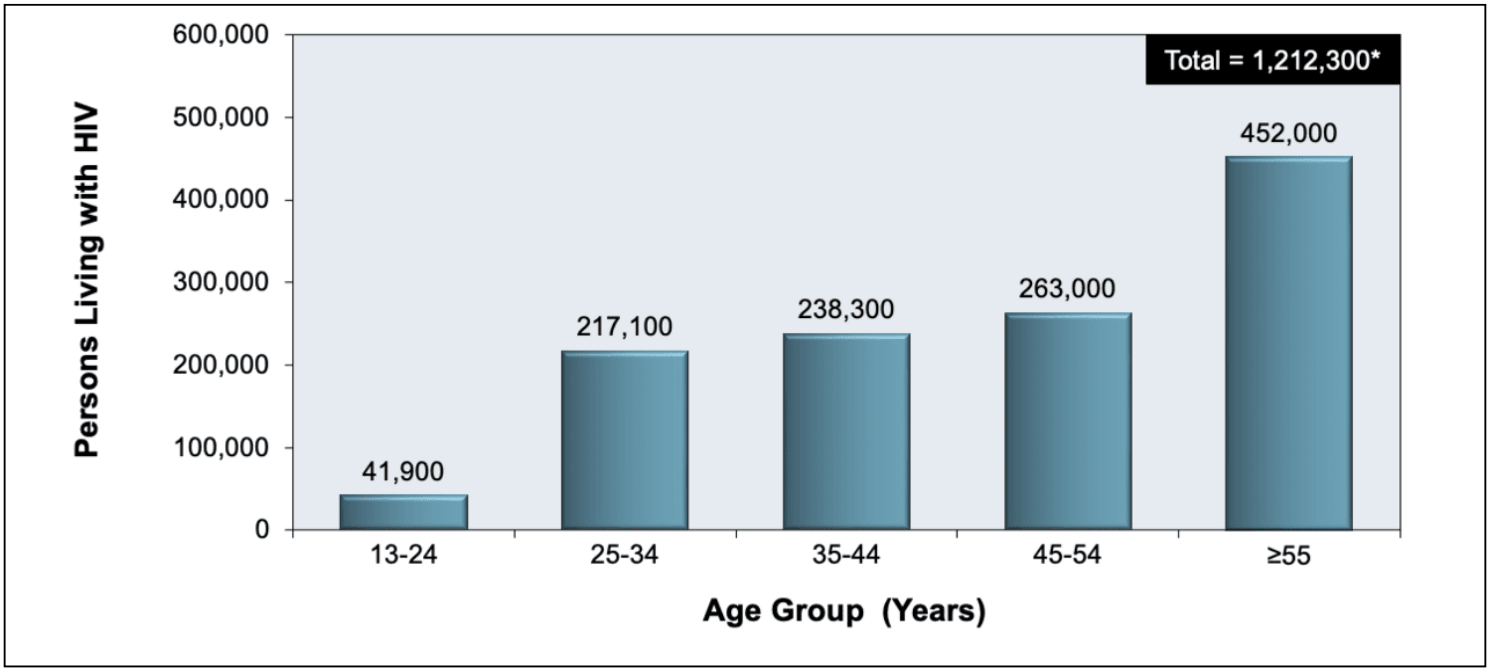


Figure 5 New HIV Diagnoses, United States, 2017-2021

Source: Centers for Disease Control and Prevention. Diagnoses of HIV infection in the United States and dependent areas, 2021. HIV Surveillance Report, 2021; vol. 34. Published May 2023.

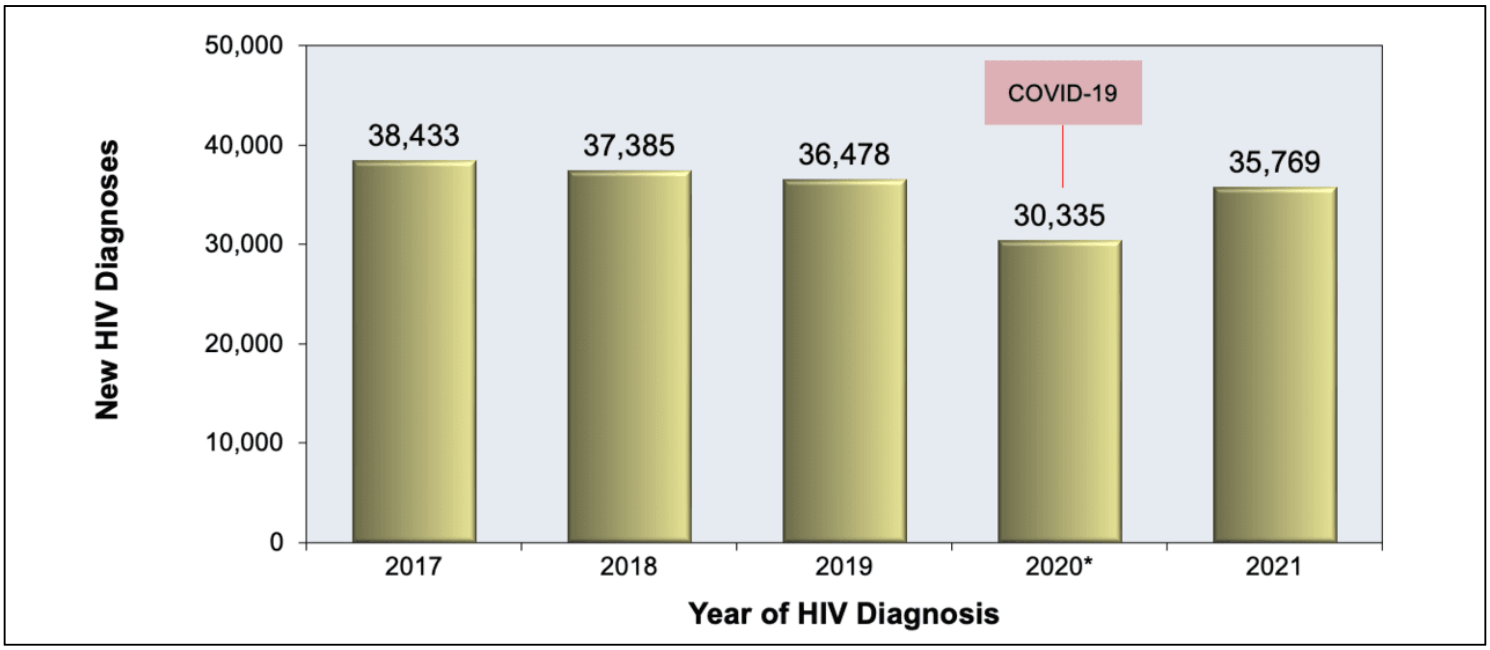


Figure 6 (Image Series) - New HIV Diagnoses in Adults and Adolescents, by Transmission Category, United States, 2021 (Image Series) - Figure 6 (Image Series) - New HIV Diagnoses in Adults and Adolescents, by Transmission Category, United States, 2021
Image 6A: New HIV Diagnoses in Adults and Adolescents,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

[+]Other = perinatal, hemophilia, blood transfusion, and risk factor not reported or identified.

Source: Centers for Disease Control and Prevention. Diagnoses of HIV infection in the United States and dependent areas, 2021. HIV Surveillance Report, 2021; vol. 34. Published May 2023.

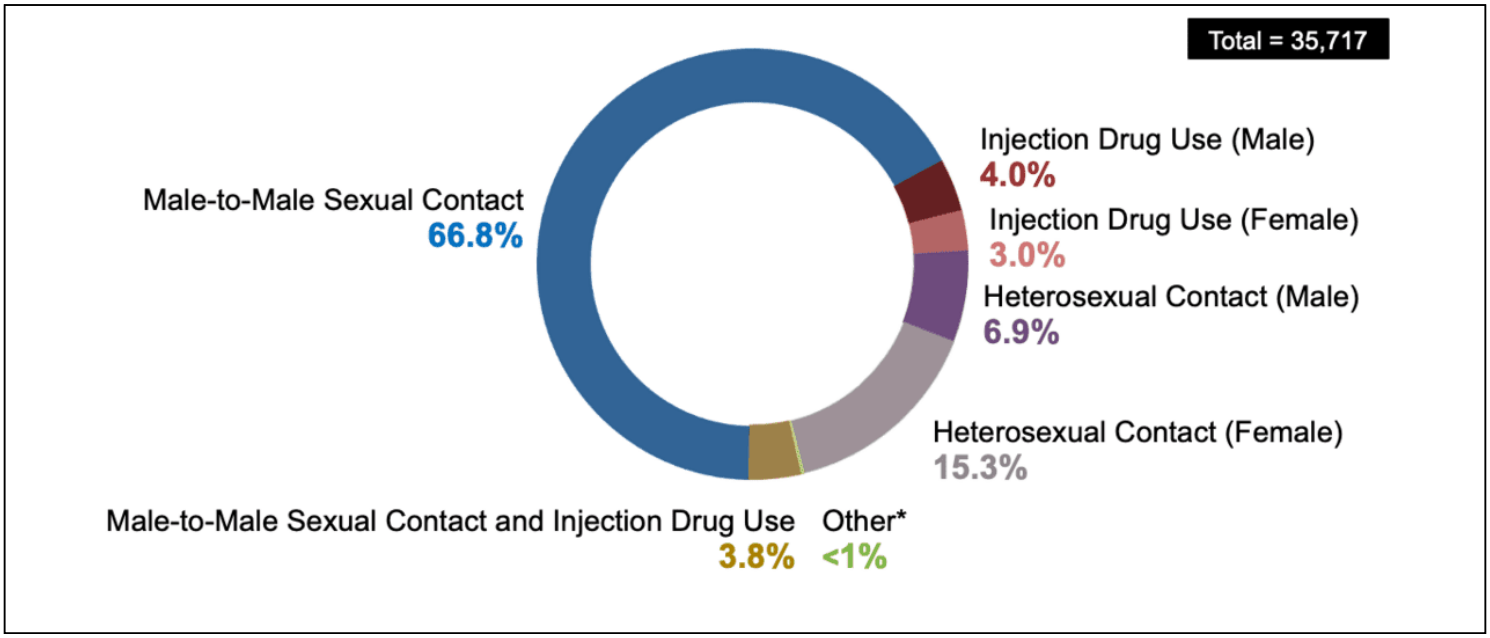


Figure 6 (Image Series) - New HIV Diagnoses in Adults and Adolescents, by Transmission Category, United States, 2021
Image 6B: Males with New HIV Diagnosis, by Transmission Category, 2021

Source: Centers for Disease Control and Prevention. Diagnoses of HIV infection in the United States and dependent areas, 2021. HIV Surveillance Report, 2021; vol. 34. Published May 2023.

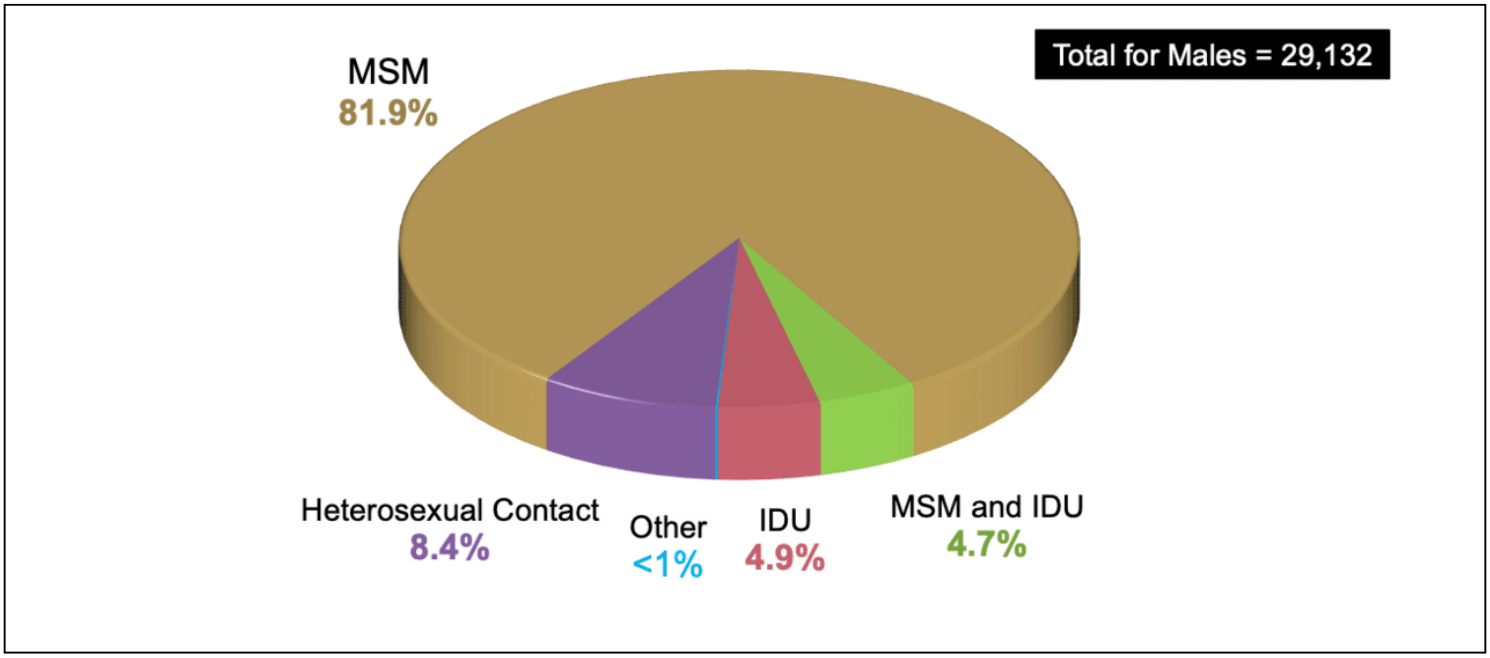


Figure 6 (Image Series) - New HIV Diagnoses in Adults and Adolescents, by Transmission Category, United States, 2021
Image 6C: Females with New HIV Diagnosis, by Transmission Category, 2021

Source: Centers for Disease Control and Prevention. Diagnoses of HIV infection in the United States and dependent areas, 2021. HIV Surveillance Report, 2021; vol. 34. Published May 2023.

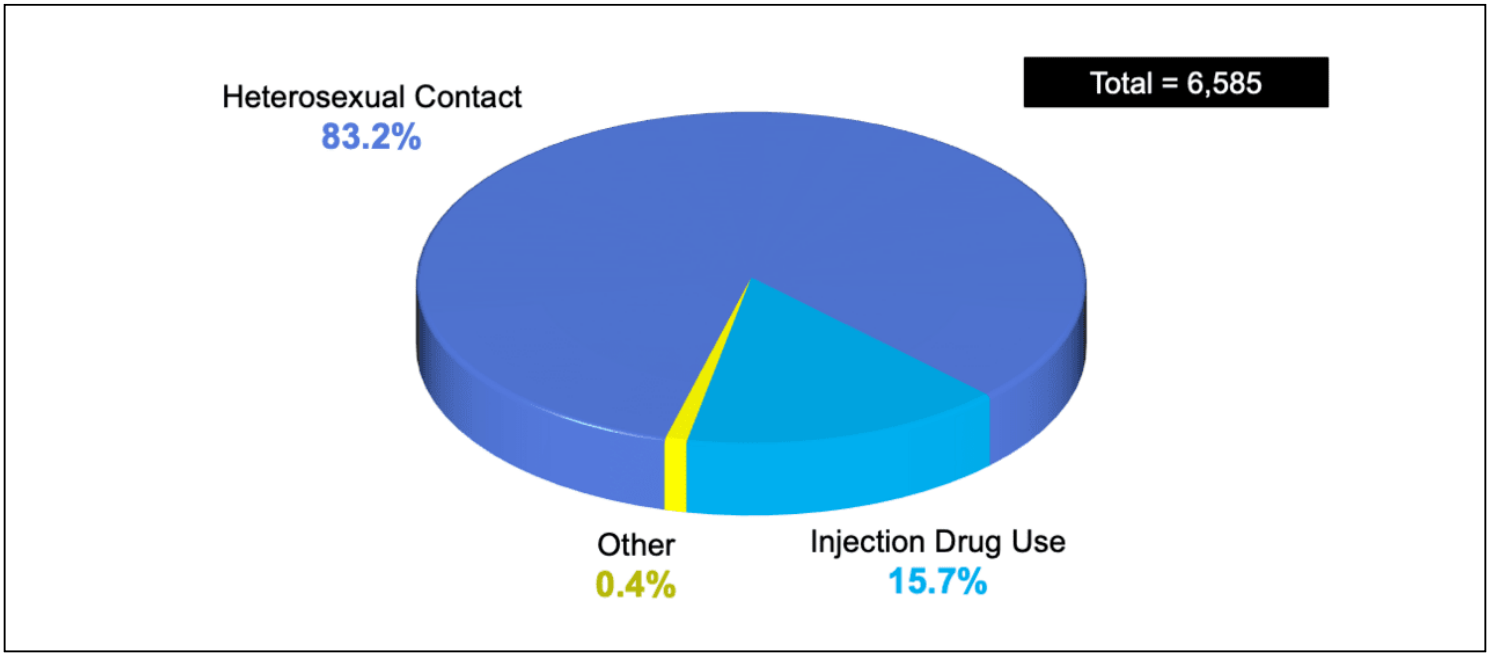


Figure 7 New HIV Diagnoses (Rate), by Race/Ethnicity, United States, 2021

Source: Centers for Disease Control and Prevention. Diagnoses of HIV infection in the United States and dependent areas, 2021. HIV Surveillance Report, 2021; vol. 34. Published May 2023.

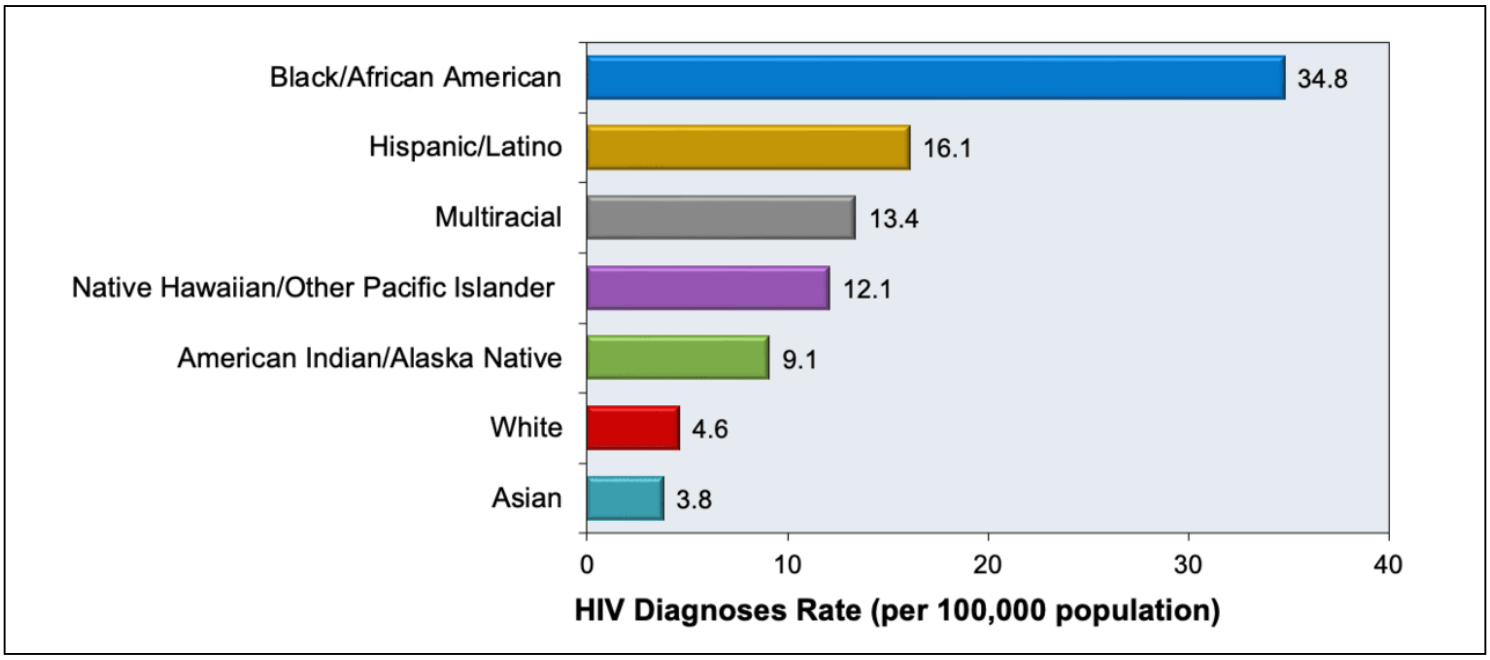


Figure 8 New HIV Diagnoses, by Age Group, United States, 2021

Source: Centers for Disease Control and Prevention. Diagnoses of HIV infection in the United States and dependent areas, 2021. HIV Surveillance Report, 2021; vol. 34. Published May 2023.

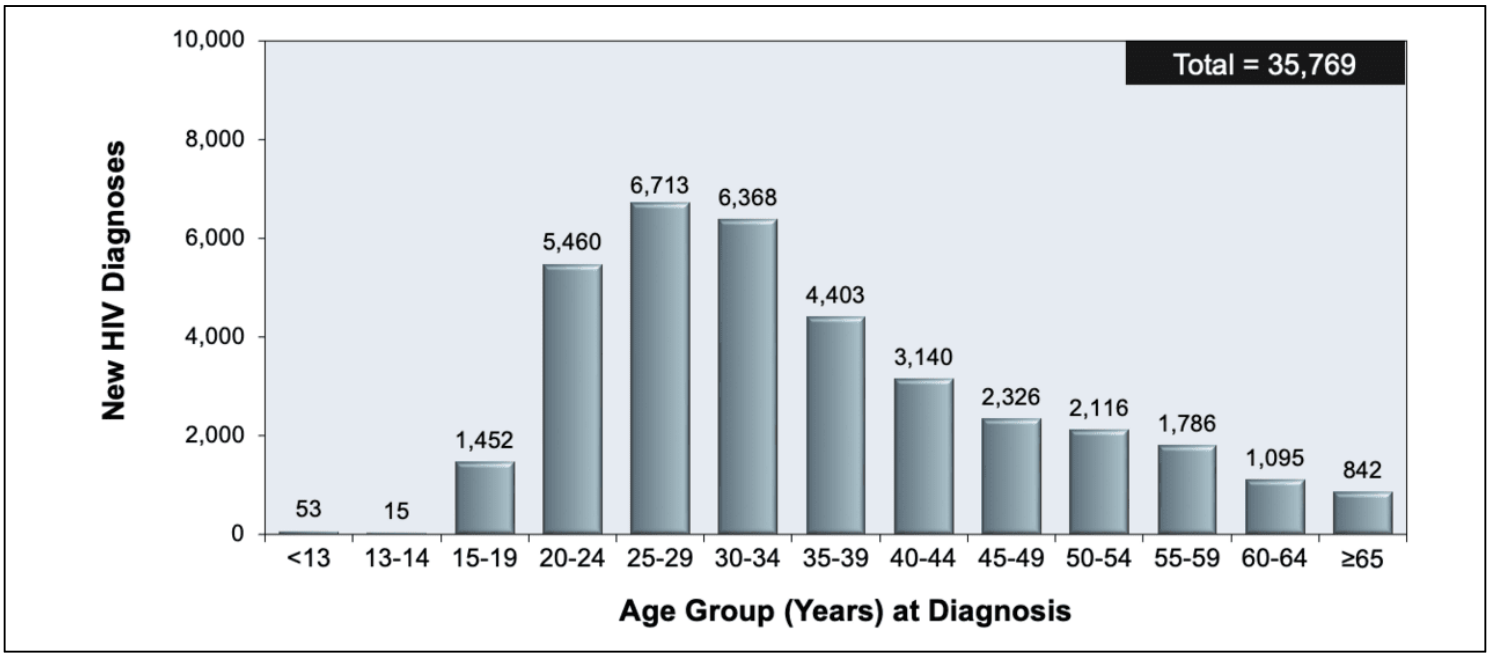


Figure 9 Proportion of Persons with Undiagnosed HIV, United States, 2015-2021

Source: Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2017–2021. HIV Surveillance Supplemental Report. 2023;28(3). Published May 2023.

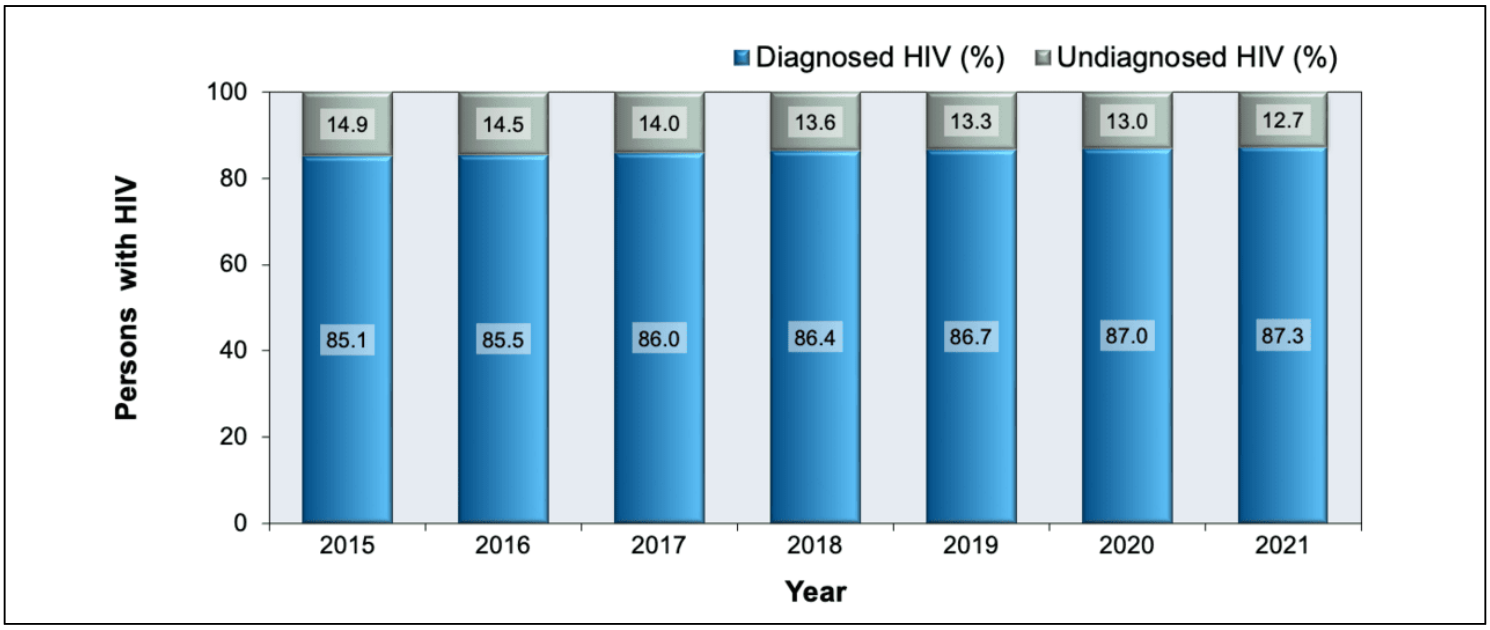


Figure 10 Proportion of Persons with Undiagnosed HIV, by Age Group, United States, 2021

Source: Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2017–2021. HIV Surveillance Supplemental Report. 2023;28(3). Published May 2023.

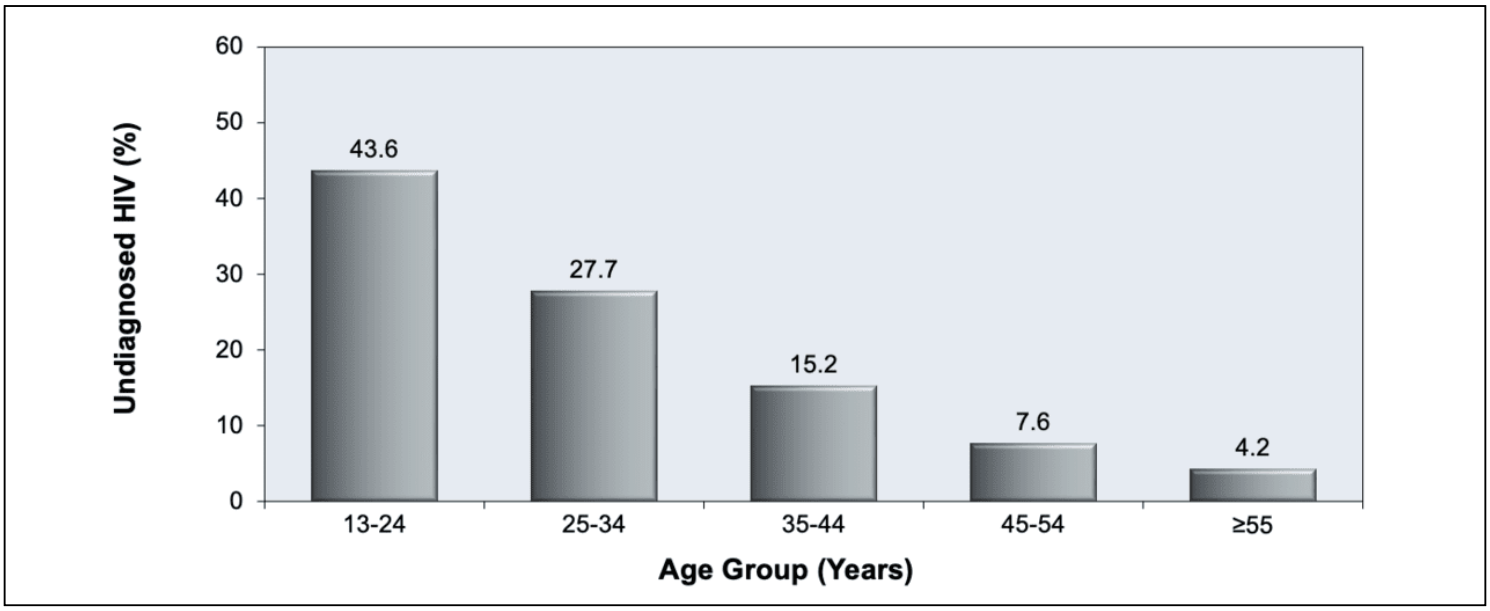


Figure 11 Estimated HIV Incidence in United States, 2017-2021

Source: Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2017–2021. HIV Surveillance Supplemental Report. 2023;28(3). Published May 2023.

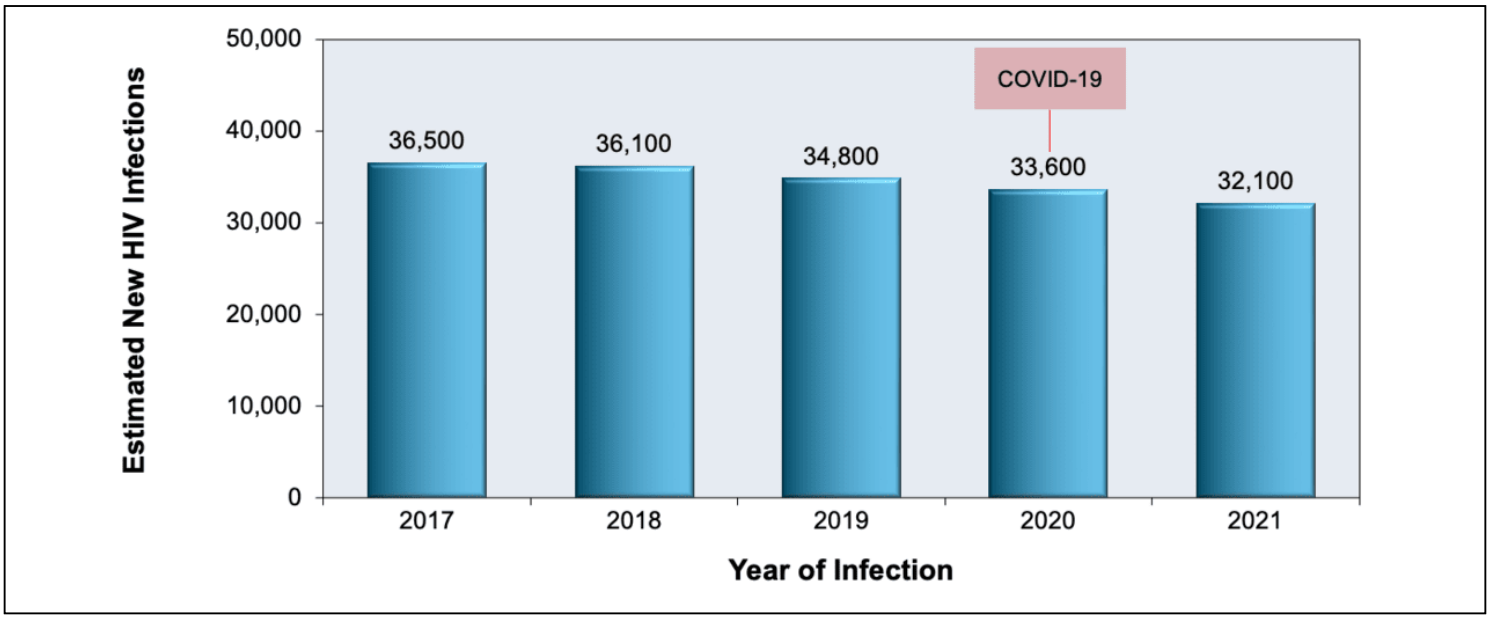


Figure 12 Estimated HIV Incidence in Persons Aged ≥13 Years, by Transmission Category, United States, 2021

Source: Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2017–2021. HIV Surveillance Supplemental Report. 2023;28(3). Published May 2023.

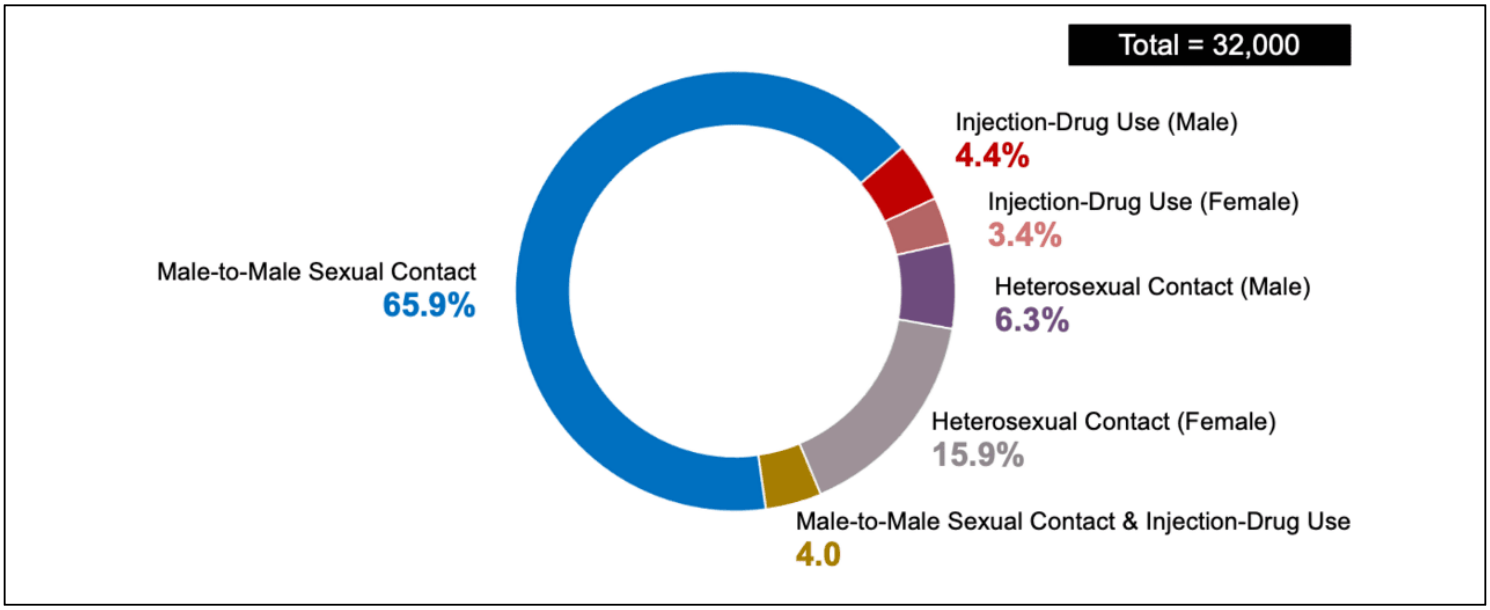


Figure 13 Estimated HIV Incidence in Persons Aged ≥13 Years, by Race/Ethnicity, United States, 2021

Source: Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2017–2021. HIV Surveillance Supplemental Report. 2023;28(3). Published May 2023.

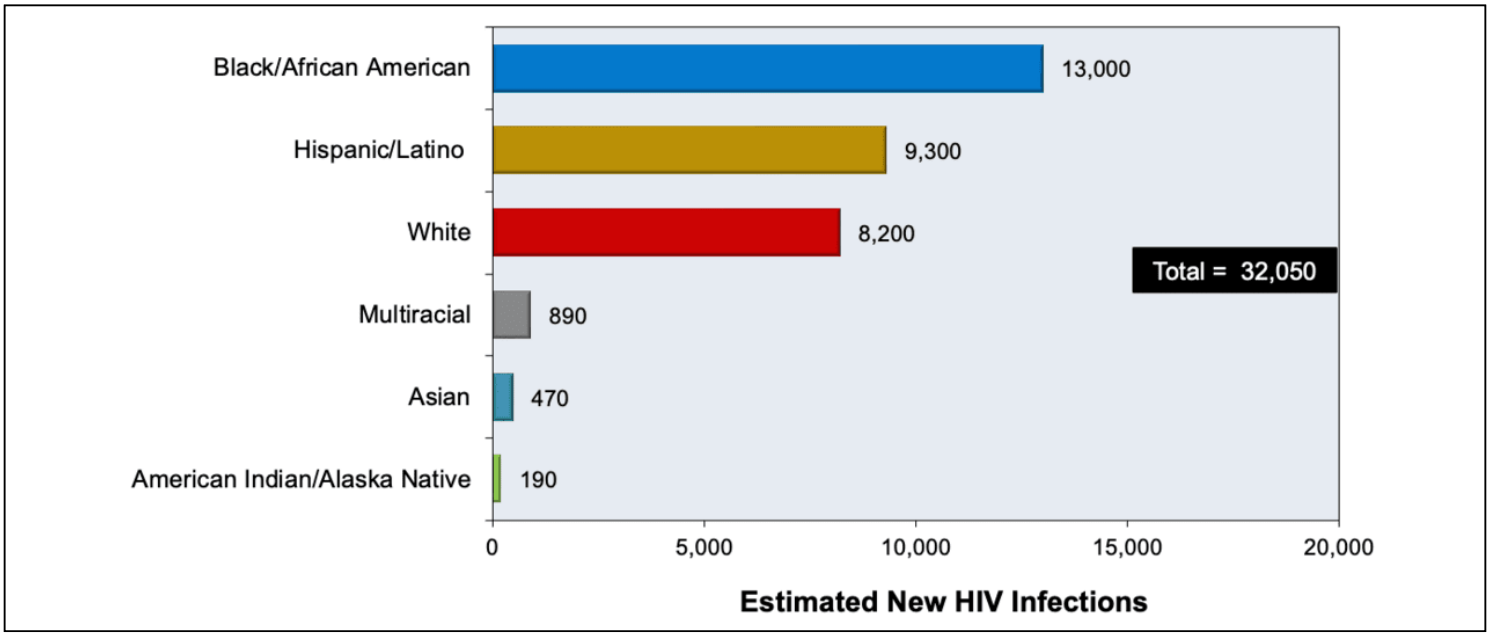


Figure 14 Estimated HIV Incidence, by Age Group, United States, 2021

Source: Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States, 2017–2021. HIV Surveillance Supplemental Report. 2023;28(3). Published May 2023.

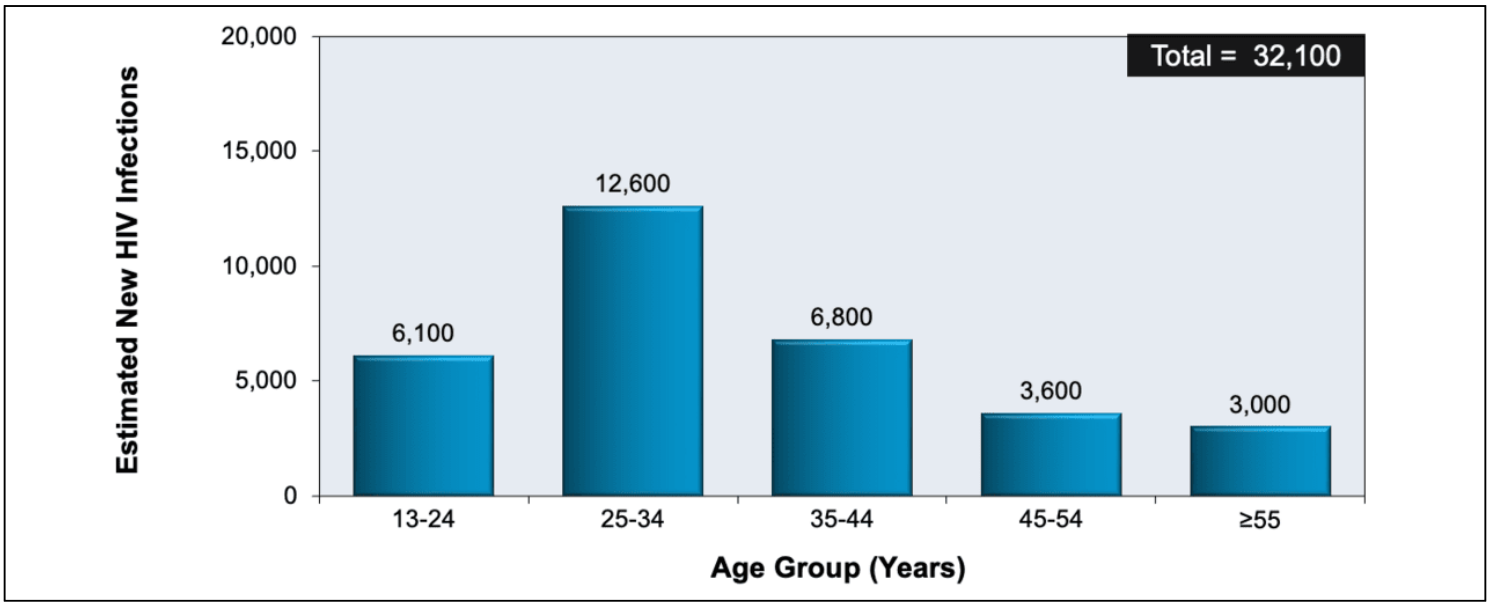


Figure 15 Annual Deaths in Persons with Diagnosed HIV, by Year, United States, 2017-2021

Source: Centers for Disease Control and Prevention. Diagnoses of HIV infection in the United States and dependent areas, 2021. HIV Surveillance Report, 2021; vol. 34. Published May 2023.

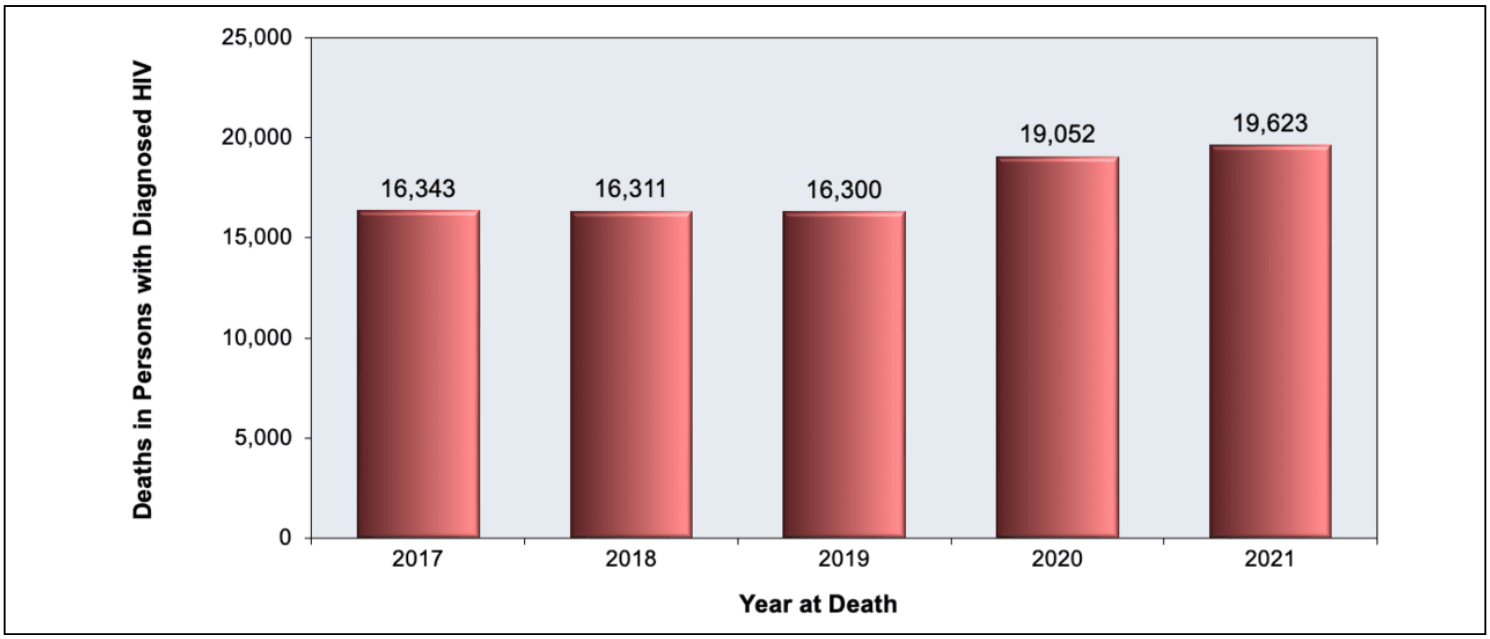
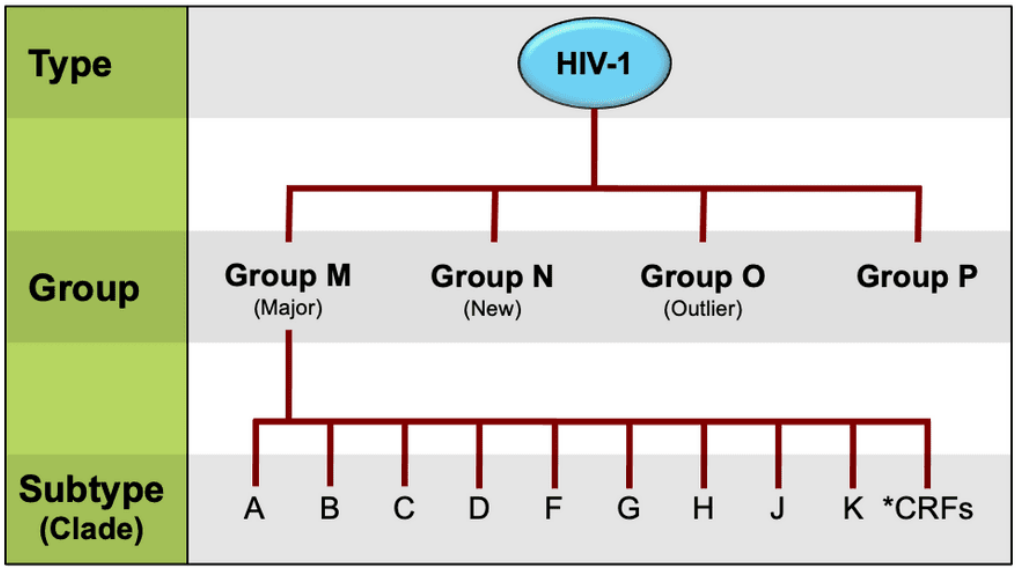


Figure 16 HIV-1-Groups

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.

Source: Taylor BS, Sobieszczyk ME, McCutchan FE, Hammer SM. The challenge of HIV-1 subtype diversity. N Engl J Med. 2008;358:1590-602.



*CRFs = Circulating Recombinant Forms

Figure 17 Global HIV Prevalence by Region, 2022

Source: UNAIDS. Fact Sheet 2023.

HIV Prevalence, by Global Region, 2022	
Region	People Living with HIV
Global Total	**39,000,000**
Eastern and Southern Africa	20,800,000
Western and Central Africa	4,800,000
Middle East and North Africa	190,000
Asia and the Pacific	6,500,000
Latin America	2,200,000
The Caribbean	330,000
Eastern Europe and Central Asia	2,000,000
Western and Central Europe and North America	2,300,000

Figure 18 Global HIV Incidence by Region, 2022

Source: UNAIDS. Fact Sheet 2023.

HIV Incidence by Region, 2022	
Region	New HIV Infection
Global Total	**1,300,000**
Eastern and Southern Africa	500,000
Western and Central Africa	160,000
Middle East and North Africa	17,000
Asia and the Pacific	300,000
Latin America	110,000
The Caribbean	16,000
Eastern Europe and Central Asia	160,000
Western and Central Europe and North America	58,000

Figure 19 Persons with HIV on Antiretroviral Therapy—Global, 1999–2022

Source: World Health Organization. Global Health Observatory Data Repository. Antiretroviral therapy coverage: estimates by WHO region.

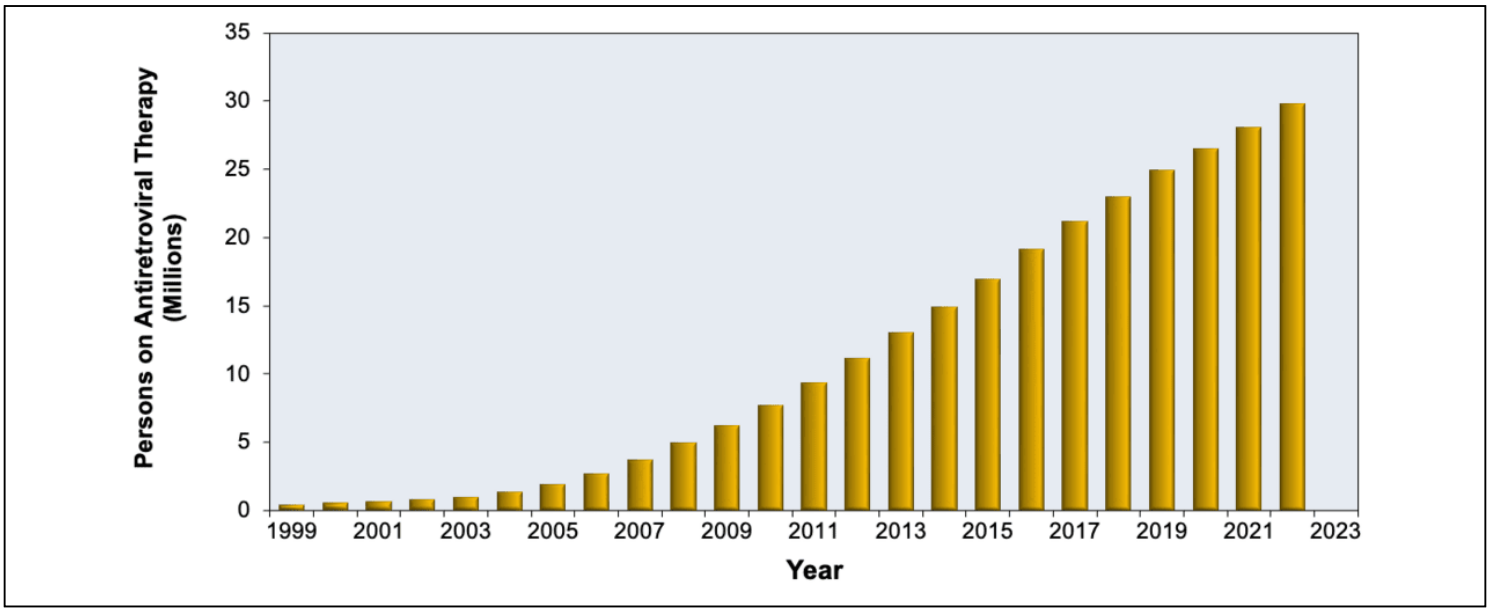


Figure 20 Global Deaths Due to AIDS During 2022

Source: UNAIDS. Fact Sheet 2022.

Death Due to AIDS, by Region, 2022	
Region	AIDS-Related Deaths
Global Total	**630,000**
Eastern and Southern Africa	260,000
Western and Central Africa	120,000
Middle East and North Africa	5,300
Asia and the Pacific	150,000
Latin America	27,000
The Caribbean	5,600
Eastern Europe and Central Asia	48,000
Western and Central Europe and North America	13,000