

# HIV in the city of Milwaukee

Supplement to the HIV Surveillance Annual Report, 2021

Diagnosis trends, new diagnoses, and prevalence through December 31, 2021



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# Summary

This report describes HIV diagnosis trends, people newly diagnosed with HIV in 2021, and the population living with HIV in Milwaukee, Wisconsin, as of December 31, 2021. It is acknowledged that COVID-19 caused unprecedented impacts over the past two years (for example, decreased HIV testing and increased telehealth). It is unclear if the declining data trends in 2020 are a true decrease in new HIV diagnoses and HIV care outcomes. Additionally, the increase in HIV diagnoses observed in 2021 may be a result of delayed testing due to the pandemic.

HIV surveillance data provide important information for planning HIV prevention and care services. Prevention services focus primarily on new diagnosis trends and the geographic and demographic distribution of new cases. Care and treatment services consider the total population of people living with HIV in the state (that is, prevalent cases), regardless of when or where they were first diagnosed.

## HIV Diagnosis Trends

Over the past 10 years, the number and rate of new HIV diagnoses have declined. Milwaukee has a relatively low diagnosis rate compared to cities of similar size and demographics. During 2012–2021:

- Young men and people of color were disproportionately affected by HIV.
- Male–male sexual contact was the most commonly reported risk factor for HIV exposure.

## New Diagnoses, 2021

During 2021, 100 people were newly diagnosed with HIV in Milwaukee.

- Seven of the ZIP codes in Milwaukee made up 56% of the new HIV diagnoses.
- A disproportionate number of new HIV diagnoses were young men of color.
- Male–male sexual contact was the most commonly reported transmission mode for HIV.
- 86% of cases were linked to care services within three months of diagnosis.

## Prevalence

A total of 2,860 people known to be living with HIV resided in Milwaukee at the end of 2021. An estimated 439 additional people may be living with HIV in Milwaukee but are not currently aware of their diagnosis. The estimated HIV prevalence was 3,299 people when those who were not aware of their diagnosis were taken into account.

- In 2021, 47 people living with HIV moved into Milwaukee.
- Over half of people living with HIV reside in six of the Milwaukee ZIP codes.
- Prevalent cases tend to be older than new diagnoses.
- 71% of people living with HIV were virally suppressed during 2021.

# HIV Diagnosis Trends

## Number and Rate of New Diagnoses

### Number of New Diagnoses

Since 1982, 5,356 Milwaukee residents were diagnosed with HIV. HIV diagnoses rose rapidly during the 1980s, peaking during 1990 at 305 new diagnoses, and then declining steeply until the early 2000s (Figure 1).

During 2012–2021, the number of diagnoses ranged from a low of 97 (2020) to a high of 117 (2014; 2017), with an average of 107 new HIV diagnoses per year.

FIGURE 1

**Over the past 10 years, the number of new HIV diagnoses reported each year in Milwaukee has slowly declined.**

Number of new HIV diagnoses, Milwaukee 1982–2021

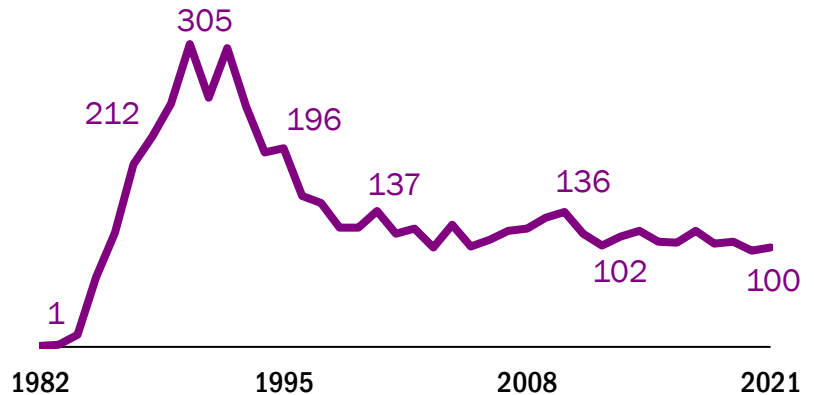
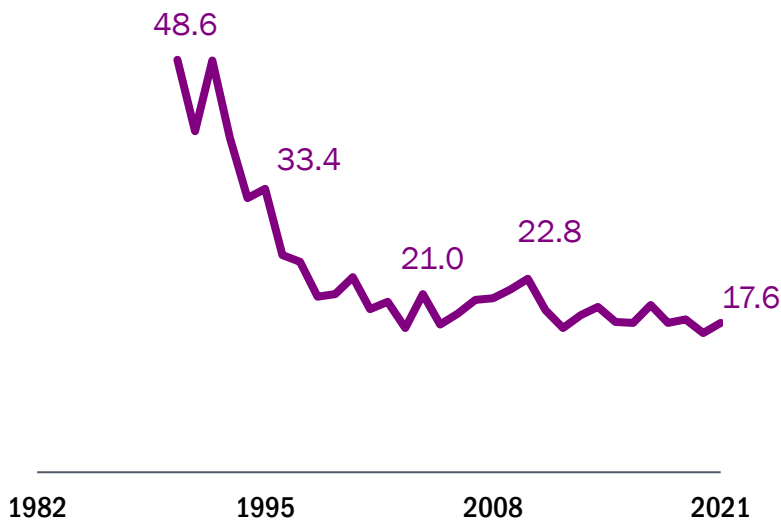


FIGURE 2

**The HIV diagnosis rate in Milwaukee has slowly declined over the past 10 years.**

Rate of new HIV diagnoses per 100,000 people, Milwaukee 1989–2021



### New Diagnosis Rate

During 1990, 48.6 new HIV cases were diagnosed per 100,000 Milwaukee residents (Figure 2). The new diagnosis rate declined to 17.6 per 100,000 people by 2021.

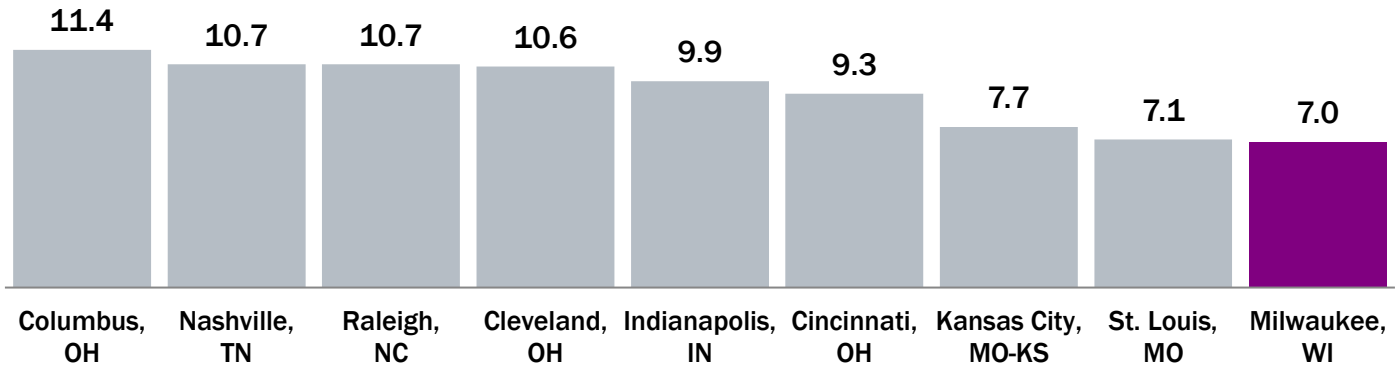
During 2012–2021, the annual diagnosis rate ranged from a low of 16.4 per 100,000 people (2020) to a high of 19.7 per 100,000 people (2017), with an average of 18.1 new HIV diagnoses per 100,000 people.

Figure 3 shows that Milwaukee’s HIV diagnosis rate is lower compared to other metropolitan statistical areas (MSA) of similar size, demographics, and economic factors.

FIGURE 3

**Milwaukee has the lowest HIV diagnosis rate compared to other metropolitan statistical areas with similar demographics.**

Estimated number of HIV diagnoses per 100,000 people by metropolitan area, 2020



\*Centers for Disease Control and Prevention. HIV Surveillance Report, 2020; vol.33. <http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html>. Published May 2022. Accessed [August 2022].

## Demographics

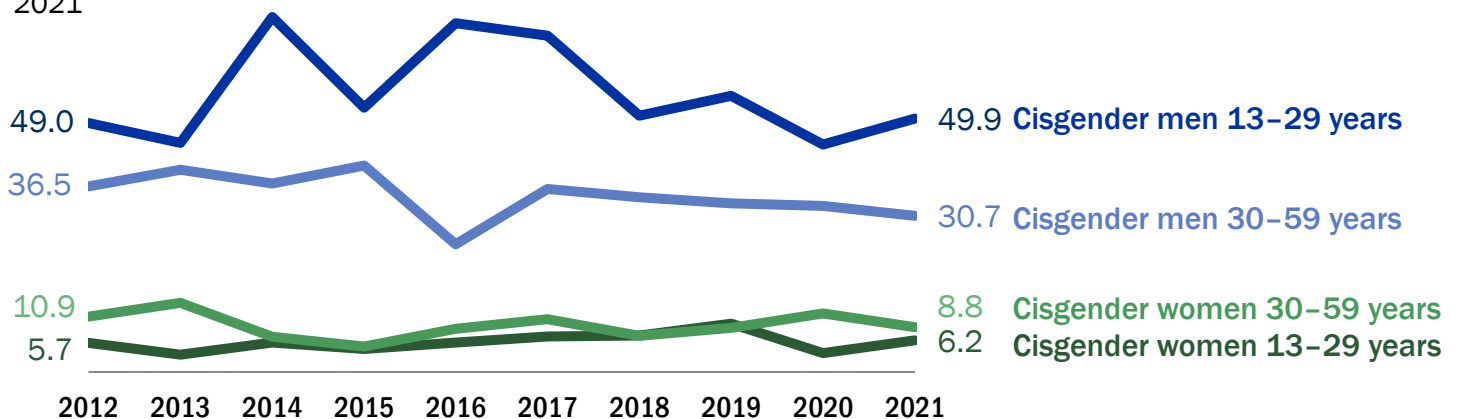
### Age and Gender at Diagnosis

During 2012–2021, the HIV diagnosis rate fluctuated among young cisgender men and both young and older cisgender women, and declined among older cisgender men (Figure 4).

FIGURE 4

**Young cisgender men have the highest HIV diagnosis rate in Milwaukee.**

Number of HIV diagnoses per 100,000 people by gender and age\* at diagnosis, Milwaukee, 2012–2021



\* Diagnosis rates among cisgender men and cisgender women ages 60 and older are unreliable due to small numbers.



## Race and Ethnicity

HIV **disproportionately** affects people of color in Milwaukee. The percentage of new HIV diagnoses affecting people of color rose from 50% in 1983 to 88% during 2021 (Figure 5). During 2021, racial and ethnic minorities made up 66% of Milwaukee’s population, and comprised 88% of new HIV diagnoses.

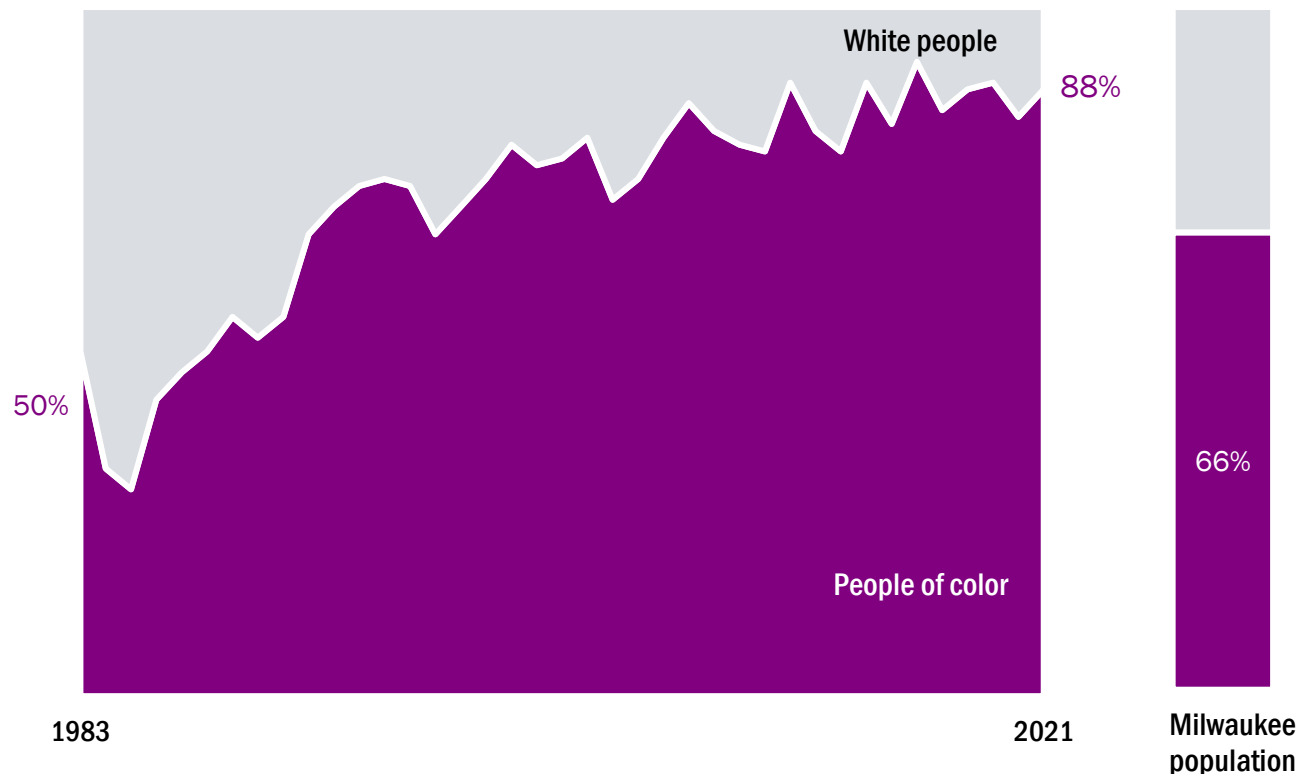
Addressing health disparities and inequities is a priority for public health. Race or ethnicity alone does not make someone more or less likely to acquire HIV. Many social and economic factors affect populations of color to a larger extent than white populations in Milwaukee, putting people of color at greater risk for acquiring HIV, such as:

- Racism
- Poverty
- Limited access to health care
- Lack of education
- Stigma
- Homelessness
- Oppression

FIGURE 5

**The percentage of new HIV diagnoses among people of color is disproportionate to Milwaukee's racial and ethnic composition.**

Percentage of new HIV diagnoses among white people and people of color, Milwaukee, 1983–2021



This disparity is more pronounced among men (Appendix-Table A1). During 2012–2021, women of all racial or ethnic groups have had lower annual HIV diagnosis rates compared to men.

## People who are Transgender

Cisgender people have a gender identity that corresponds with their sex assigned at birth. Conversely, transgender people have a gender identity that does not conform to their sex assigned at birth. This includes people who self-identify as transgender women, transgender men, and other gender nonconforming identities.

Gender identity and sexual orientation are separate, distinct concepts, with gender identity referring to an individual's sense of themselves and sexual orientation referring to an individual's attractions and partnering.

Transgender people face an increased risk for HIV due to stigma, discrimination, social rejection and exclusion, violence, and barriers faced in health care settings, such as lack of provider knowledge on transgender people's unique needs.<sup>1</sup>

Since 1982, 100 transgender individuals have been diagnosed with HIV in Milwaukee (six transgender men and 94 transgender women). While collection of self-reported gender identity has improved over time, the number of diagnoses among transgender individuals in Milwaukee may be underreported.

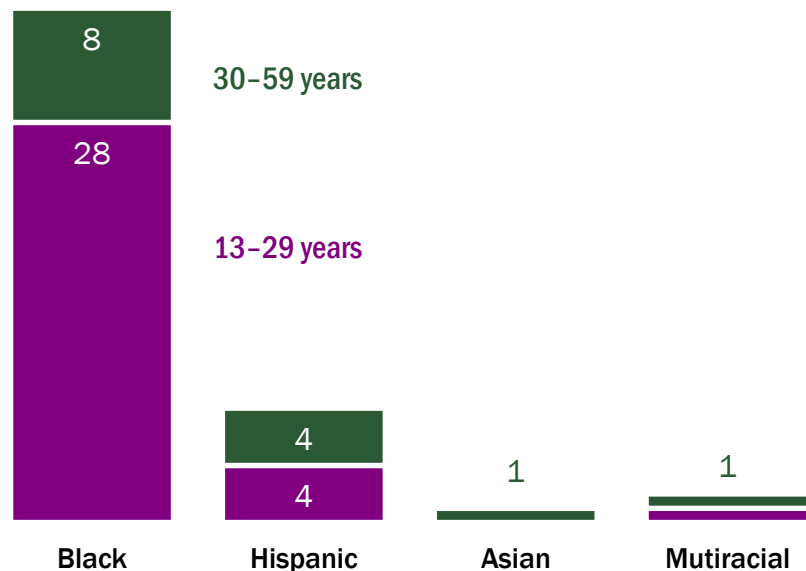
Of the 100 HIV diagnoses among transgender individuals, 48 occurred between 2012 and 2021 (Figure 6).

- All but one was from a racial or ethnic minority group.
- The majority of the individuals were under age 30 (69%).
- Over 90% of recent diagnoses were attributed to sexual contact (44 of 48).

FIGURE 6

**Seven out of ten of the transgender people diagnosed with HIV in the last 10 years were young people of color.**

Number of HIV diagnoses among transgender people by age at diagnosis and race and ethnicity, Milwaukee, 2012–2021



<sup>1</sup> Centers for Disease Control and Prevention. HIV Among Transgender People. <https://www.cdc.gov/hiv/group/gender/transgender/>. Published April 2017.

## Transmission Category

### Adult Transmission Risks

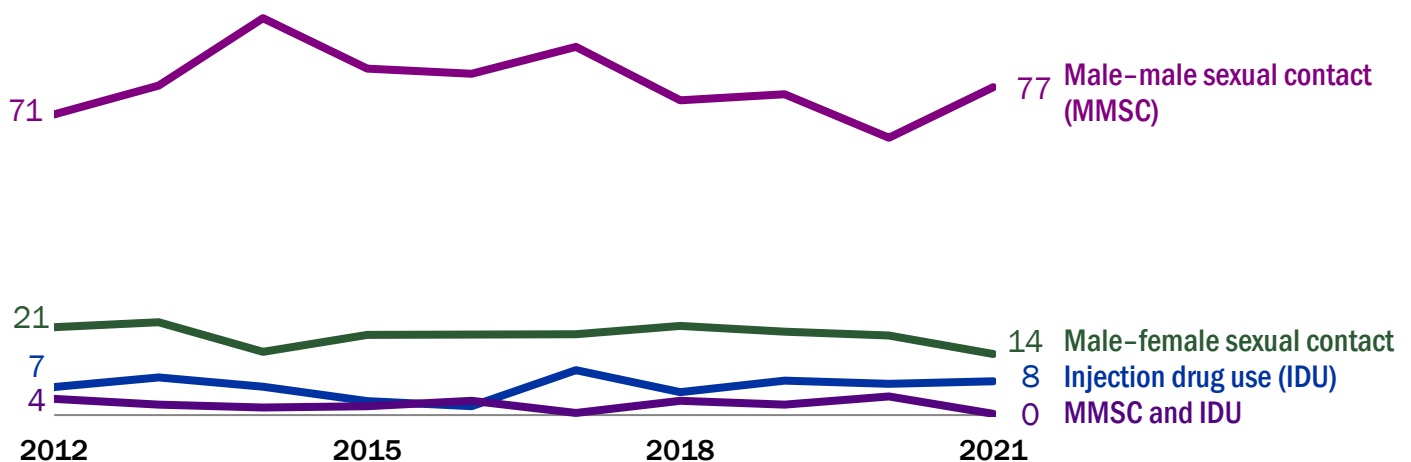
Some people newly diagnosed with HIV do not know for certain how they were exposed or do not choose to share their risk factors for HIV exposure with their doctor. A statistical method called imputation is used to estimate the probable transmission category for people with an unknown transmission category (see Technical Notes).

During 2012–2021, the estimated number of diagnoses attributed to male–male sexual contact, injection drug use, and male–female sexual contact remained stable (Figure 7).

FIGURE 7

### Male-male sexual contact is the most common HIV transmission risk.

New HIV diagnoses by estimated transmission category\*, Milwaukee, 2012–2021



\*Data have been statistically adjusted to account for those with unknown transmission category.

## Late Diagnosis

A late diagnosis occurs when a person living with HIV progresses to Stage 3 (AIDS) within one year of receiving their initial diagnosis. Without treatment, progression to Stage 3 typically occurs eight to 10 years after HIV was acquired. Stage 3 status is clinically defined by having a very low CD4 white blood cell count or a Stage 3-defining opportunistic infection. Early diagnosis and access to HIV care can prevent progression to Stage 3 so that people living with HIV have longer and healthier lives.

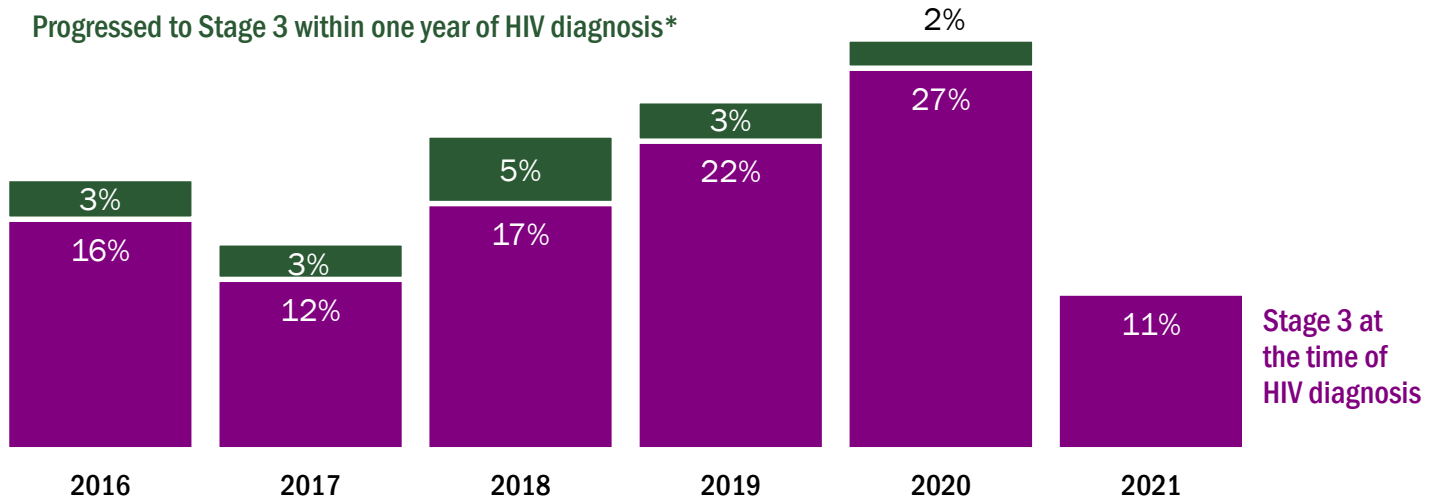
The percentage of new HIV diagnoses that progressed to Stage 3 at the time they were first identified fluctuated from 2016 to 2021, with a low of 11% in 2021 and a high of 27% in 2020 (Figure 8).



FIGURE 8

## The percentage of people who had progressed to Stage 3 at the time of diagnosis fluctuated during 2016-2021.

Percentage of people who progressed to Stage 3 HIV infection within one year of diagnosis, Milwaukee. 2016–2021



\*Those diagnosed with HIV during 2021 have not had one full year to evaluate progression to Stage 3 and have been excluded.

Of people who received a late HIV diagnosis during 2016–2020:

- The majority (67%) were men.
- Over half (64%) were Black, 21% were Hispanic, and 13% were White.
- The majority (70%) were over age 30 at the time of diagnosis.
- Approximately 43% had a transmission category of male–male sexual contact, 11% had a transmission category of male–female sexual contact, and 4% had a transmission category of injection drug use.

# New Diagnoses, 2021

## Number of New HIV Diagnoses

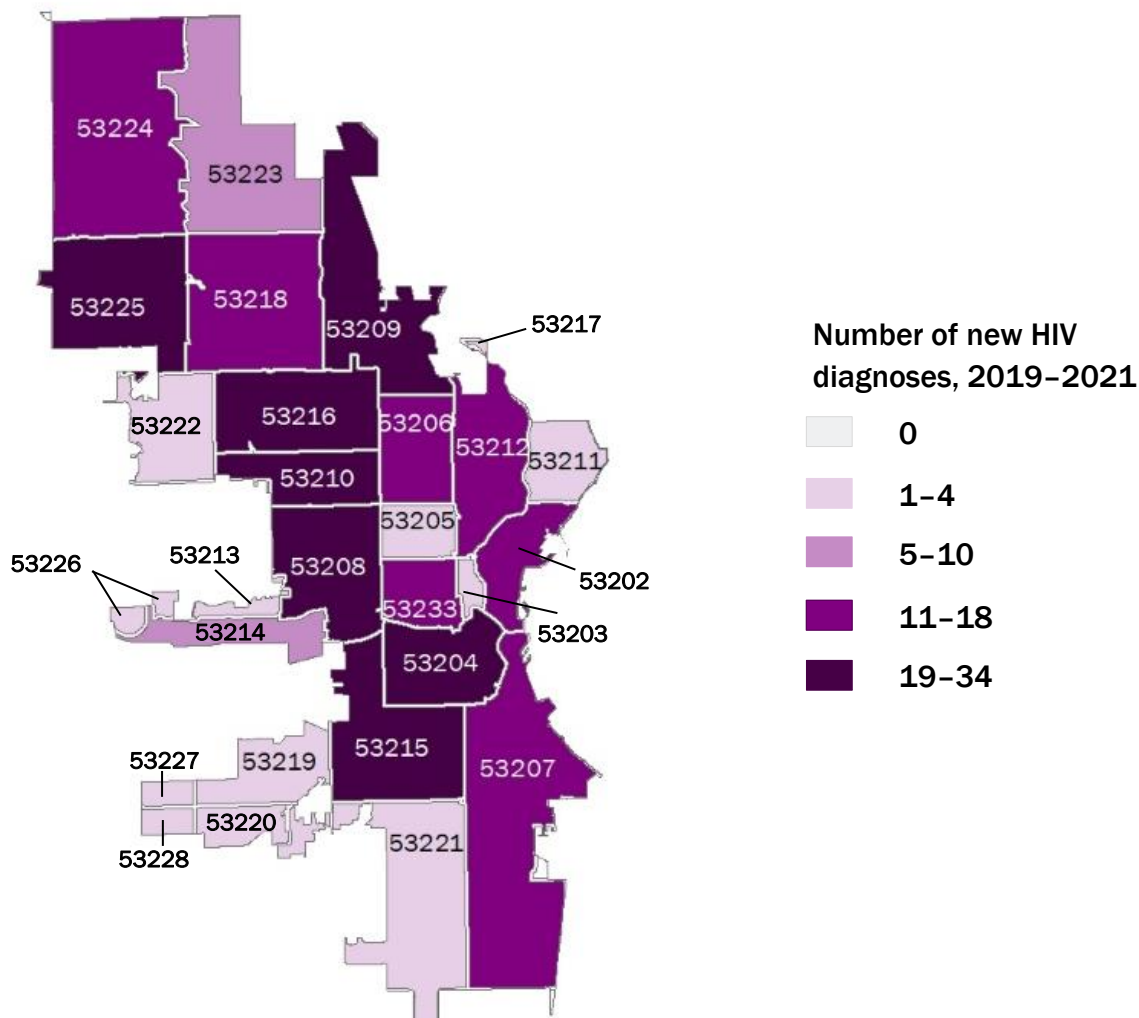
New HIV diagnoses are Milwaukee residents who received their first HIV diagnosis during the current reporting period. During 2021, 100 Milwaukee residents were newly diagnosed with HIV, or 17.6 new diagnoses per 100,000 Milwaukee residents.

During 2019–2021, new HIV diagnoses were reported among residents from 28 Milwaukee zip codes. The majority of new HIV cases were diagnosed in seven zip codes: 53204 (33), 53209 (26), 53225 (26), 53215 (23), 53210 (22), 53216 (20), and 53208 (19) (Figure 9, Appendix-Table A2).

FIGURE 9

**The majority of new HIV cases were identified in seven ZIP codes.**

Geographic distribution of new HIV diagnoses, Milwaukee, 2019–2021



## Recent and Acute Infections

Recent HIV infections are those diagnosed during the six months after HIV was acquired, as evidenced by a documented or self-reported negative HIV test during this period (see Technical Notes). Acute HIV infections are those diagnosed during the two to four weeks after HIV exposure.

People in the acute stage of infection have a high viral load (that is, a large number of viruses in the blood) and are more able to transmit HIV to others due to high levels of virus in the body. Rapid linkage of people with acute infections to partner services ensures that exposed partners receive timely HIV testing.

During 2021, 17 people received a recent or acute HIV diagnosis in Milwaukee. Of these 17 people, one was considered acute diagnoses based on laboratory testing algorithms or presence of acute symptoms.

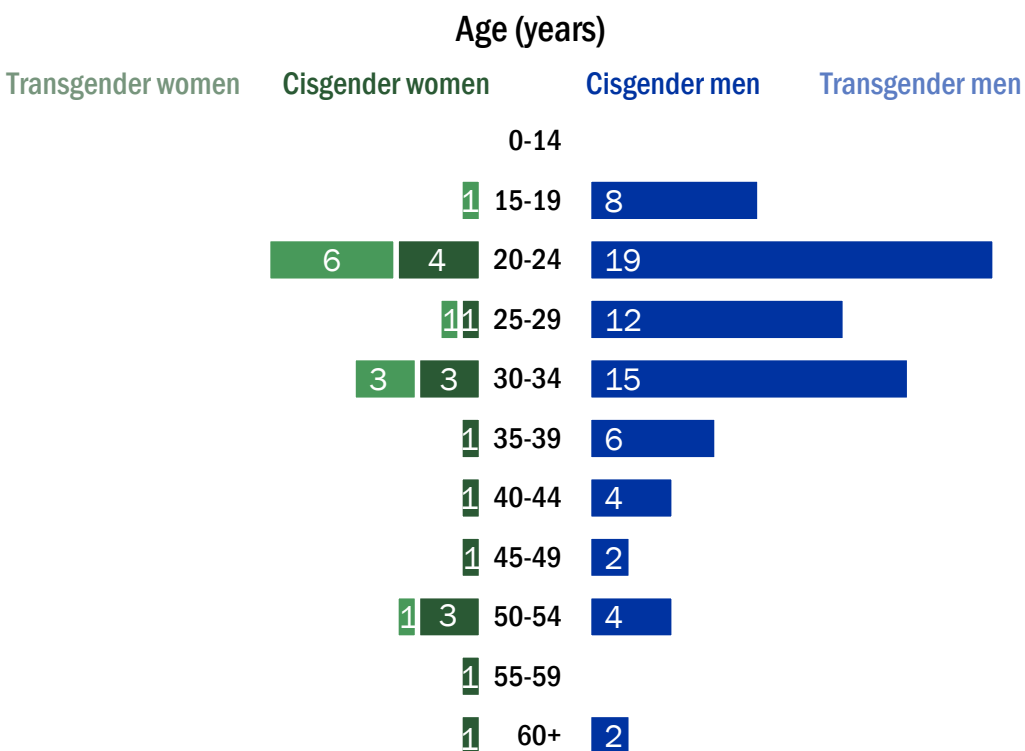
## Demographics

During 2021, 72 cisgender men, 16 cisgender women, and 12 transgender women were diagnosed with HIV in Milwaukee (Figure 10, Appendix-Table A3).

FIGURE 10

### Approximately 1 out of 3 new HIV diagnoses during 2021 were among young cisgender men under 30.

Number of HIV diagnoses by age and gender, Milwaukee, 2021



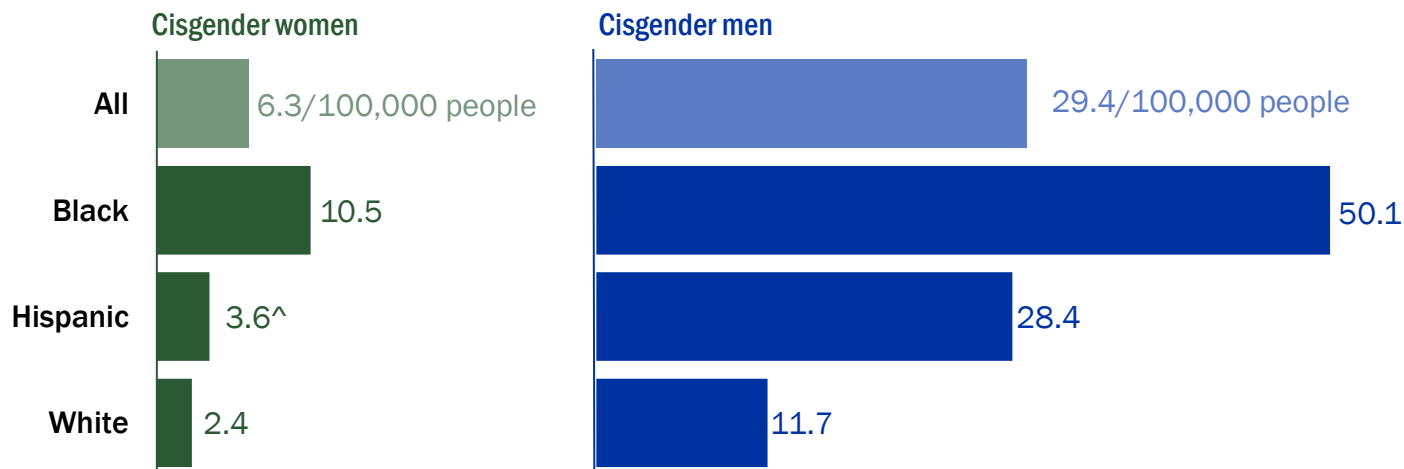
The average (median) age at diagnosis was 28.5, with a range of 17–69. During 2021, newly diagnosed cisgender men had a lower average age at diagnosis than cisgender women (men, 28; women, 34.5).

During 2017–2021 (years have been combined due to the small numbers for some racial/ethnic groups), the new HIV diagnosis rate was higher for cisgender men and was higher among Black and Hispanic people compared to other race or ethnicity groups (Figure 11).

FIGURE 11

**Black cisgender men were diagnosed with HIV at higher rate than other groups.**

Number of new HIV diagnoses per 100,000 people by gender\* and race or ethnicity, Milwaukee, 2017-2021



\*Twenty-eight transgender persons diagnosed during 2017-2021 are excluded from these rates as population denominators are not available to calculate rates.

\*\*Rates based on counts less than five have been suppressed.

<sup>^</sup> Rate is unreliable due to a count less than 12.

## Transmission Category

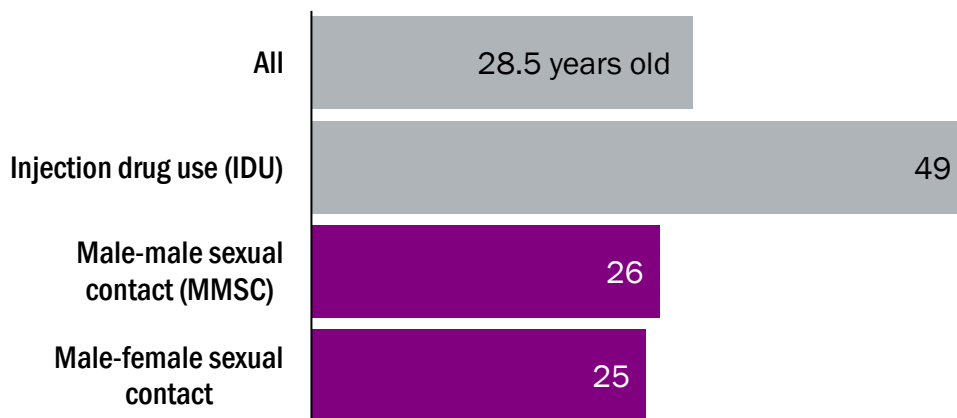
### Age

Transmission categories are determined by what people disclose about behaviors that might lead to HIV exposure. People who reported sexual contact as a possible route of exposure to HIV tended to be younger (Figure 12).

FIGURE 12

**People who reported sexual contact tended to be younger at HIV diagnosis than those who reported injection drug use.**

Median age at HIV diagnosis by transmission category, Milwaukee, 2021



Within the male–male sexual contact transmission category, Black males tended to be younger at diagnosis compared to Hispanic and White males (Figure 13).

**Gender**

Three out of four new diagnoses were attributed to an estimated transmission category of male–male sexual contact (Figure 14). The remainder was attributed to male–female sexual contact (16%), injection drug use (9%), or both male–male sexual contact and injection drug use (0.3%).

Among transgender individuals, all 12 diagnoses were attributed to sexual contact.

FIGURE 13

**Of people who reported male–male sexual contact (MSM), Black males were younger at HIV diagnosis than Hispanic and White males.**

Median age at HIV diagnosis by race and ethnicity for those reporting male-male sexual contact, Milwaukee, 2021

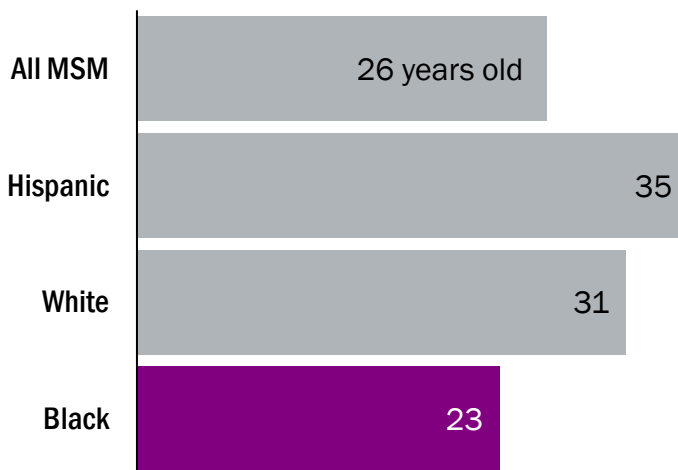
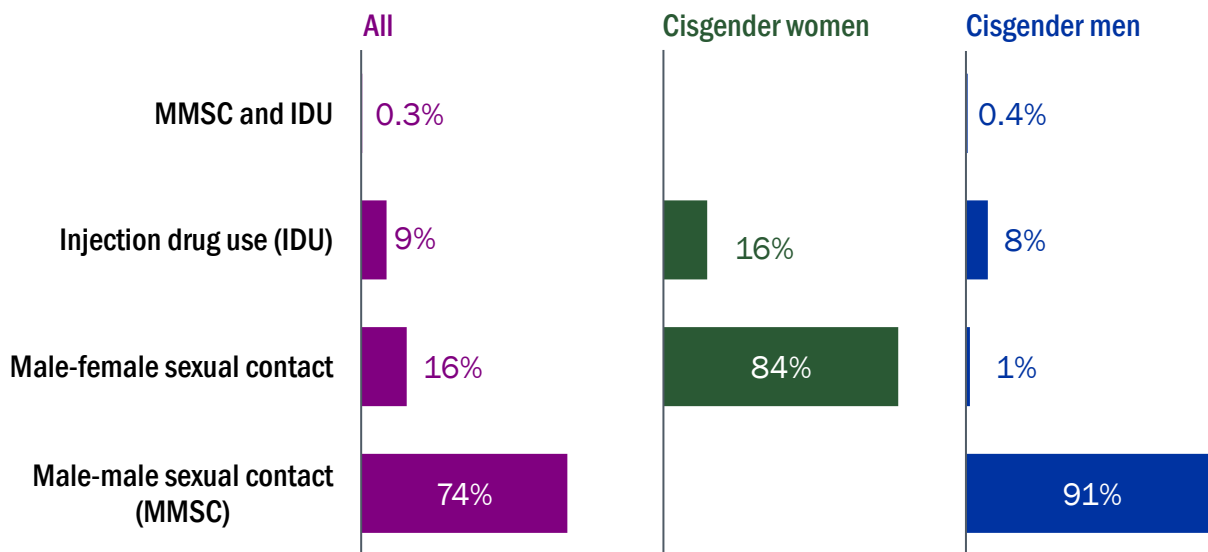


FIGURE 14

**Three out of four new HIV diagnoses were attributed to male-male sexual contact.**

Percentage of HIV diagnoses by gender and estimated transmission category\*, Milwaukee, 2021



\*Data have been statistically adjusted to account for those with unknown transmission category.

During 2021, there were three diagnoses with a reported transmission category of injection drug use and zero with a reported transmission category of male–male sexual contact and injection drug use. The number of diagnoses attributed to injection drug use in 2021 was similar compared to the previous year (three reported injection drug use and three reported male–male sexual contact and injection drug use).

## Facility at Diagnosis

HIV testing occurs in a variety of settings, including publicly funded test sites and private medical clinics. Counseling, testing, and referral (CTR) sites in the city of Milwaukee are funded by the Division of Public Health. These CTR sites include community-based organizations and the city health department.

During 2021, the most common settings for HIV diagnoses were outpatient clinics (35%); inpatient facilities (19%); local health departments (12%); family planning clinics (11%); and community-based organizations (7%; Figure 15).

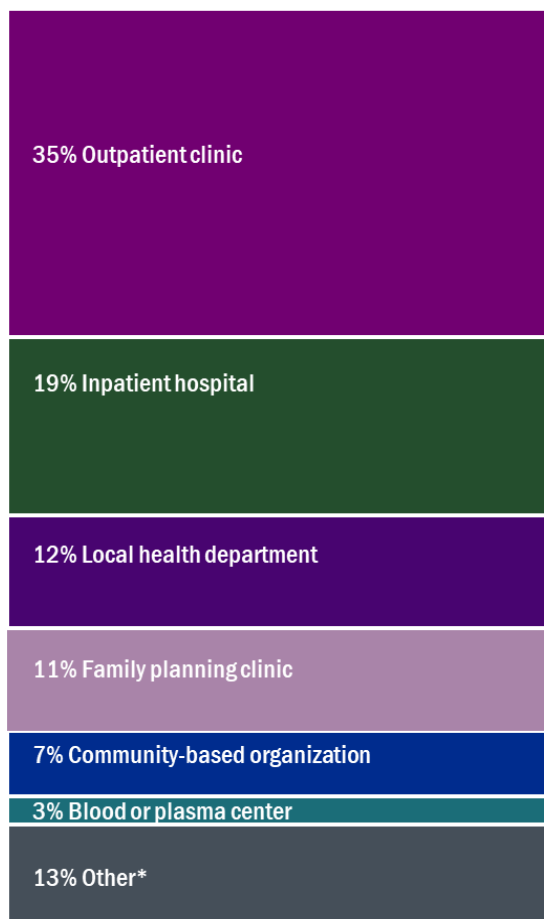
FIGURE 15

### Diagnosis by Facility

Percent of new HIV diagnoses by facility, Milwaukee, 2021

#### New HIV diagnoses (100 people)

Over a third of people were newly diagnosed with HIV infection at **outpatient clinics** during 2021.



\*Other includes diagnosis at a jail or prison (2%), emergency room or urgent care (2%), HIV clinic (3%) or other locations (5%).

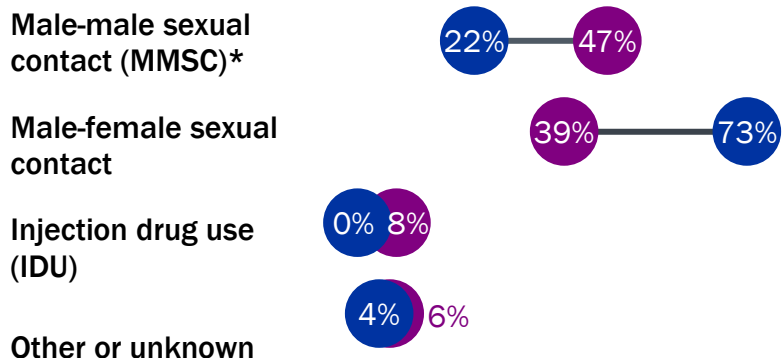


FIGURE 16

**CTR sites with testing objectives provided more HIV tests to people who reported male-male sexual contact and injection drug use.**

Percentages of HIV test by CTR type and exposure type, Milwaukee, 2021

CTR sites with no testing objectives      CTR sites with testing objectives



\*Also includes those with reported exposure of MMSC and IDU

**Counseling, Testing, and Referral (CTR) Sites**

The Wisconsin HIV CTR Program is designed to serve individuals at increased risk for HIV because their reported exposures comprise the majority of HIV cases in Wisconsin—men who have sex with men, men who have sex with men and inject drugs, and people who inject drugs among other priority groups. However, the COVID-19 pandemic disrupted the in-person HIV testing services at these CTR sites. During 2021, one out of five new diagnoses occurred at the CTR sites (Figure 15).

Depending on the funding source, some testing sites have testing objectives. Those sites with the testing objectives provided more HIV tests among people who reported male–male sexual contact including those who also reported injection drug use, and people who only reported injection drug use than the sites without the objectives (Figure 16). The sites without testing objectives primarily tested people with reported male-female sexual contact risk (73%).

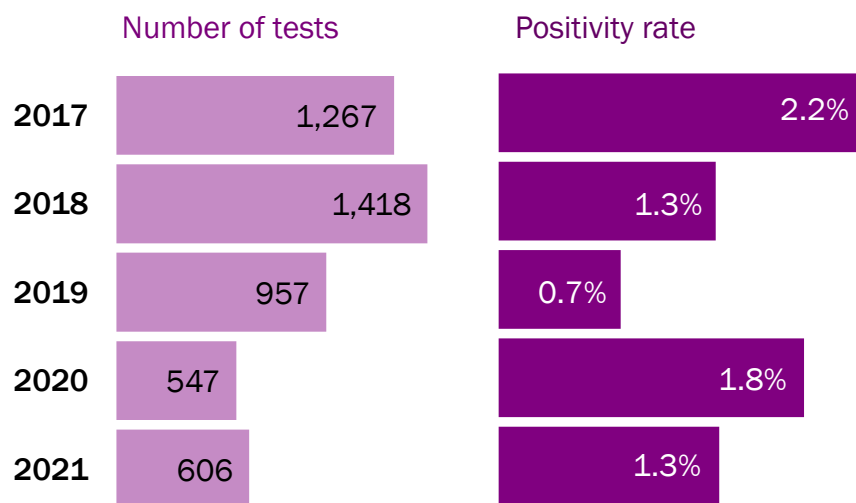
The overall positivity rate in Milwaukee—the number of new HIV diagnoses divided by the total number of HIV tests for each year—is higher among men who reported male–male sexual contact (summarized here as MSM). Specifically, the positivity rate was highest among Black MSM followed by Hispanic MSM.

Among Black MSM, the number of HIV tests conducted by CTR sites in Milwaukee has fluctuated around a median of 957 tests per year during 2017–2021. The overall positivity rates ranged from 0.7% to 2.2% during this time period with a median of 1.3% (Figure 17).

FIGURE 17

**Among Black men who reported male–male sexual contact, the number of HIV tests conducted by CTR sites has fluctuated during 2017–2021.**

Number of CTR HIV tests and positivity rate among Black men who reported male–male sexual contact, Milwaukee, 2017–2021



## Linkage to Care

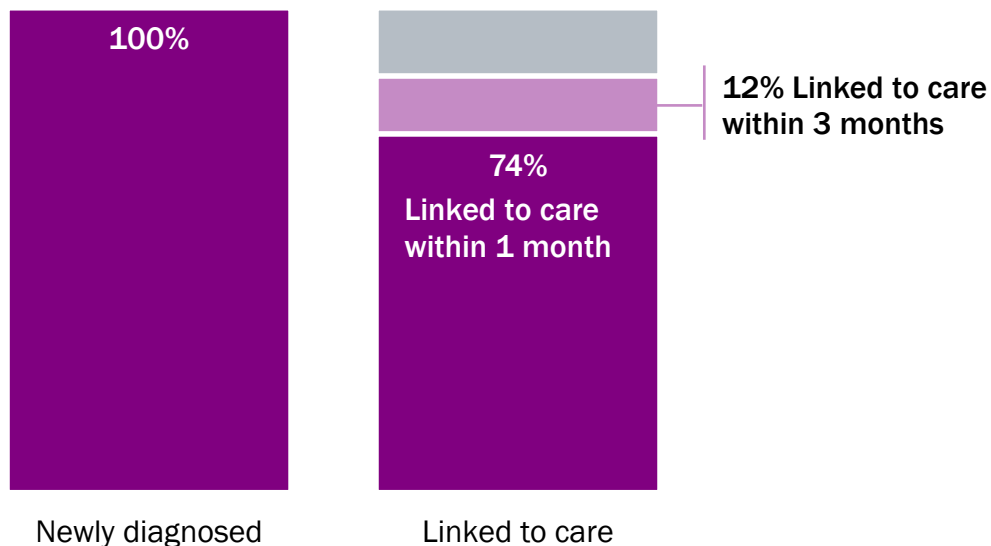
Timely linkage to care (visiting an HIV health care provider within one month (30 days) after learning they were living with HIV) can help people living with HIV have healthier lives and prevent further HIV transmission. Access to medications that reduce the amount of virus in the body can lower the risk of transmitting HIV by sexual contact.

The HIV care continuum is used at state, regional, and local levels to measure and monitor engagement in care and health outcomes for people living with HIV (Appendix-Figure A1). A portion of the care continuum specifically measures timely linkage to care (Figure 18).

FIGURE 18

**Three out of four people newly diagnosed with HIV are linked to care services within one month of diagnosis.**

HIV care continuum\* - Linkage to care, Milwaukee, 2021



\*Reflects laboratory data received through August 29, 2022

# Prevalence

## Number of People Living with HIV

### Observed Prevalence

Prevalence is the total number of people living with HIV in Milwaukee at the end of the reporting period. Prevalent HIV cases are defined as people living with HIV who:

- Currently live in Milwaukee according to surveillance and address records.
- Are alive as of the end of the reporting period.

Prevalence fluctuates due to new diagnoses, migration, and deaths (Figure 19).

At the end of 2021, 2,860 people living with HIV resided in Milwaukee.

### People who are Unaware of HIV Diagnosis

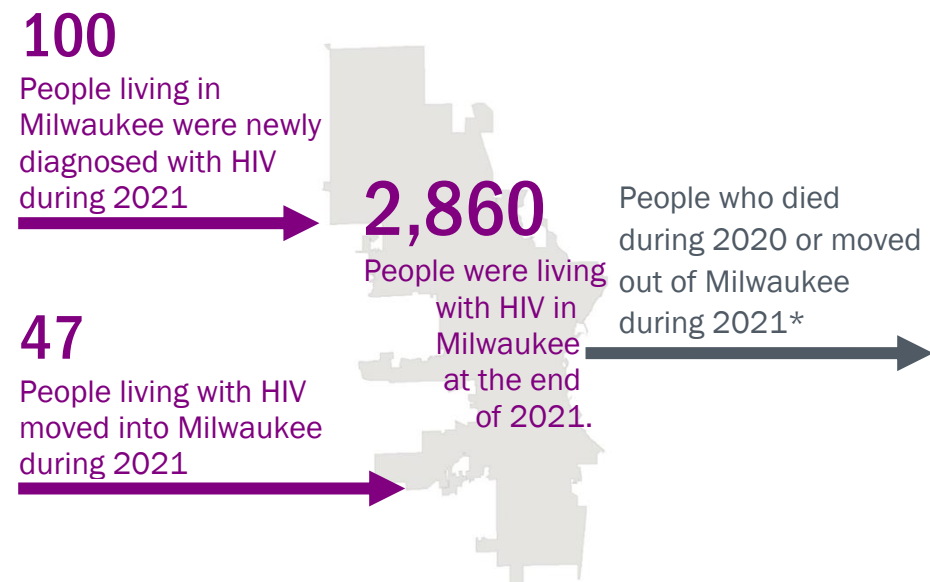
Not everyone living with HIV is aware of their diagnosis. The estimated prevalence of HIV in Milwaukee that includes those unaware of their status is approximately 3,299 people.

The most recent CDC estimate<sup>2</sup> suggests that nationally, 13.3% of people (about one out of seven) living with HIV are unaware of their status. Given CDC's estimate, the observed prevalence likely underestimates the total population of people living with HIV in Milwaukee by approximately 439 people who are not aware of their HIV diagnosis.

FIGURE 19

### The number of people living with HIV in Milwaukee in 2021 remains similar to 2020

Flow of people living with HIV into and out of Milwaukee, 2021



\* Specific breakdown of the number of persons who died and moved to another city or state are not available at the city-level; see statewide report for summary of people living with HIV during 2021.

<sup>2</sup> Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States 2015-2019. *HIV Surveillance Supplemental Report* 2021;26 (No. 1). <https://www.cdc.gov/hiv/library/reports/hiv-surveillance.html>. Published May 2021. Accessed September 2021.

According to the CDC, awareness of HIV infection status may be substantially lower for younger people and slightly lower for some racial and ethnic minorities due to barriers to getting tested (Appendix-Table A4). This understanding can guide prioritization of services to populations with the highest need for HIV testing.

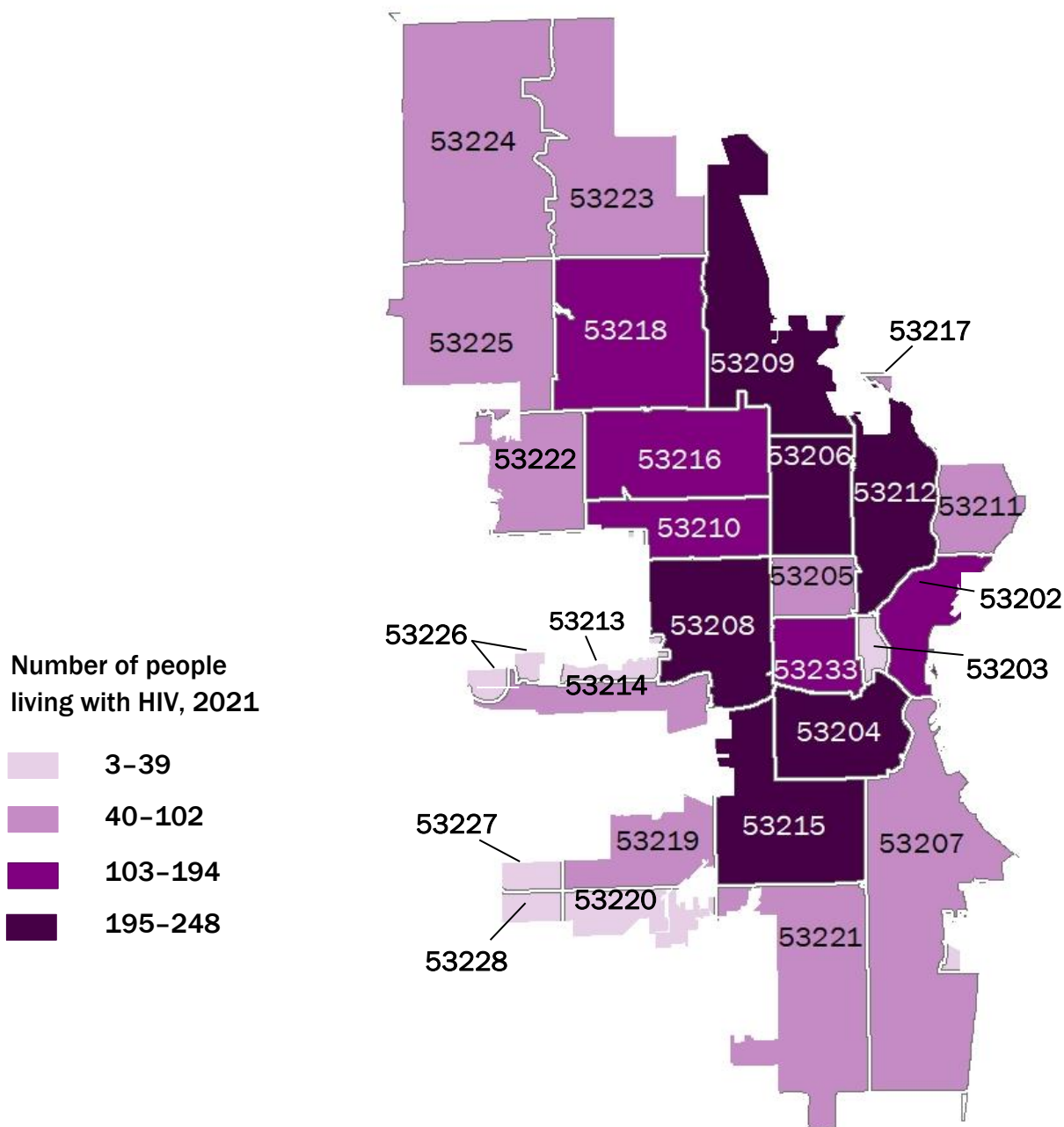
### Geographic Distribution of People Living with HIV

Three out of seven individuals (46%) living with HIV in Milwaukee currently reside in six ZIP codes: 53204 (9%), 53208 (9%), and 53215, 53206, 53209, and 53212 (7% each; Figure 20).

FIGURE 20

#### The majority of people living with HIV live in the **central** part of the city.

Geographic distribution of people living with HIV in Milwaukee, 2019–2021



## Migration

New HIV reports are Milwaukee residents living with HIV who were identified to public health for the first time during the reporting period. These include both new diagnoses and people who were diagnosed in another state prior to moving to Milwaukee.

Of the 147 new HIV reports received during 2021, 47 (32%) were previously diagnosed in another state or country prior to moving to Milwaukee. People living with HIV who moved to Milwaukee during 2021 tended to be older and a higher percentage were White compared to new HIV diagnoses in Milwaukee (Appendix-Table A3).

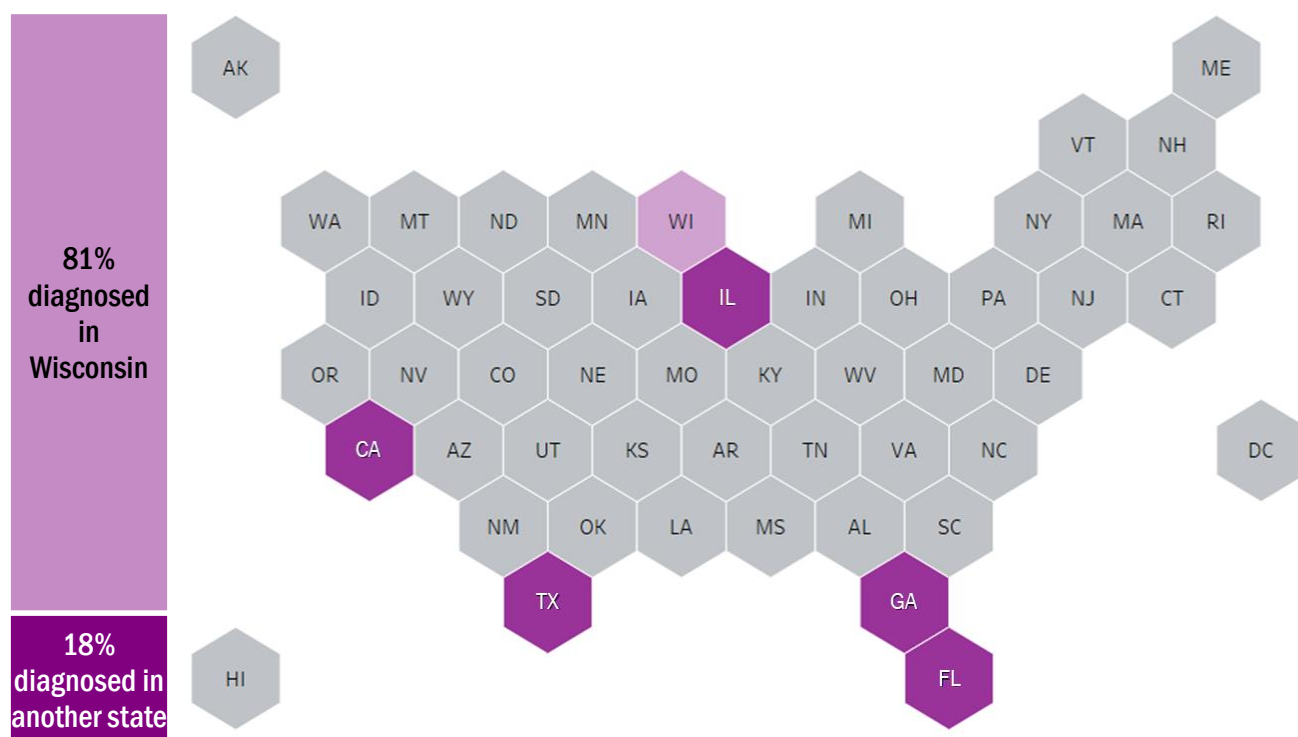
Approximately four out of five (81%) of the 2,860 people living with HIV in Milwaukee during 2021 were diagnosed in the state. The remaining 516 people (18%) were diagnosed in these locations:

- Illinois (136)
- California (36)
- Georgia (30)
- Florida (28)
- Texas (34)
- Another state (200)
- A foreign country (64)

FIGURE 21

### Most people living with HIV in Wisconsin were diagnosed in Wisconsin or in Illinois, California, Texas, Georgia, or Florida.

Diagnosis location of people living with HIV in Wisconsin during 2021



## Demographics

Of people living with HIV in Milwaukee during 2021:

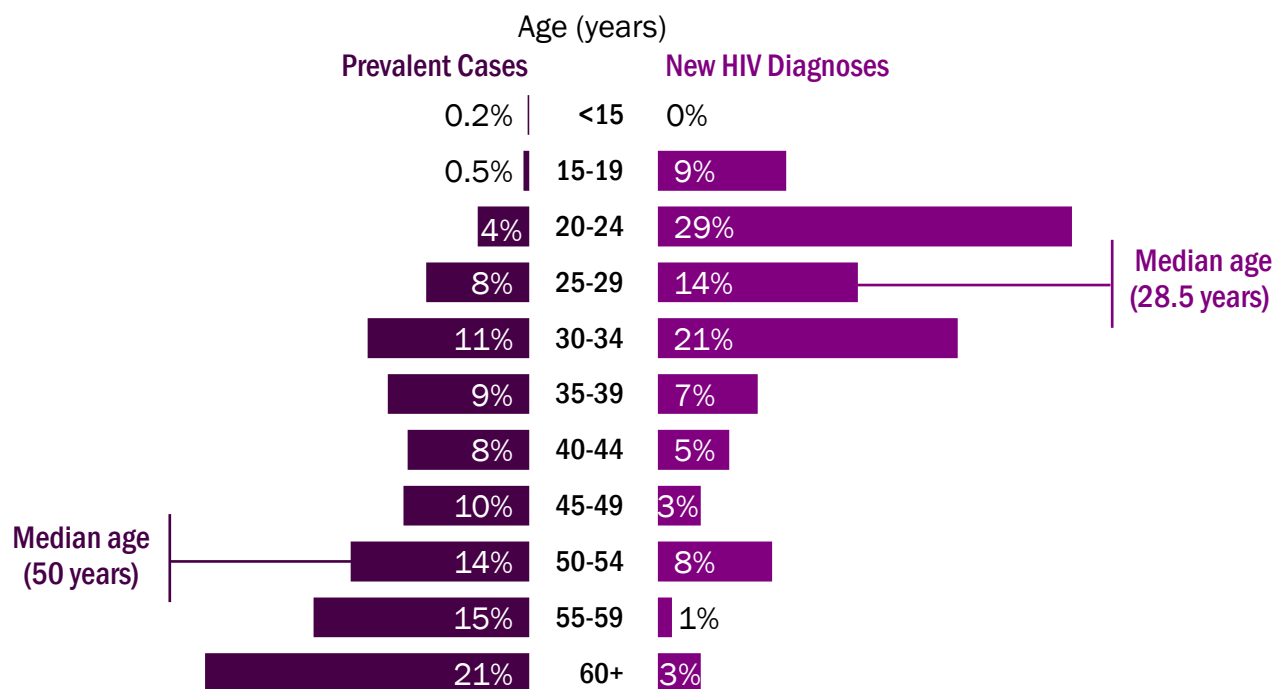
- The majority (72%) are male.
- The majority are over age 30 (89%) and half (50%) are over age 50.
- Three out of five (60%) are Black, 23% are Hispanic, and 12% are White.
- Nearly two-thirds (65%) had a transmission category of male–male sexual contact, 4% had a transmission category of male–female sexual contact, and 3% had a transmission category of injection drug use or both injection drug use and male–male sexual contact.

People living with HIV are living longer and healthier lives. This has resulted in a shift in the average age of prevalent cases compared to those being newly diagnosed. Services for people living with HIV need to address health conditions associated with aging in addition to HIV, while prevention efforts need to target younger age groups.

FIGURE 22

### The population of all people living with HIV in Wisconsin tends to be older than people newly diagnosed with HIV infection during 2021.

Age distribution of people currently living with HIV in Wisconsin (prevalent cases) compared to age at diagnosis for people newly diagnosed during 2021





## Retention in Care

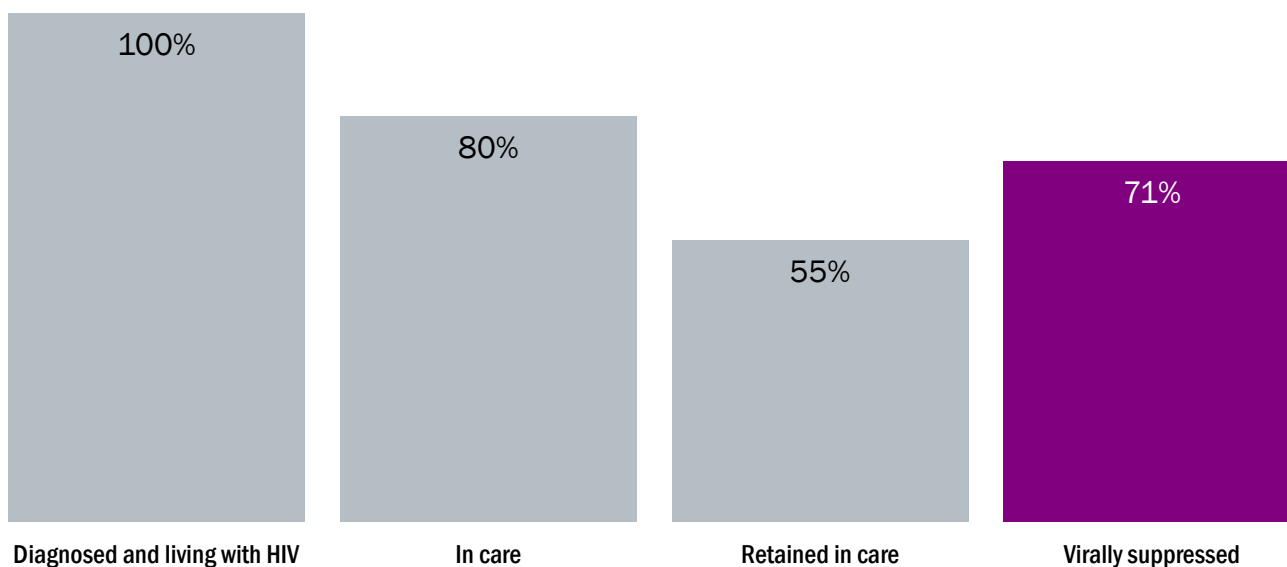
Access to HIV care and medications that reduce the amount of virus in the body (that is, the viral load) benefit both the health of people living with HIV and HIV prevention efforts. Individuals with a viral load that cannot be detected by standard laboratory diagnostic testing (that is, are virally suppressed) have a negligible risk of transmitting HIV through sexual contact.

The HIV care continuum is used at state, regional, and local levels to measure and monitor HIV engagement in care and health outcomes (Appendix-Figure A1). A portion of the care continuum specifically measures engagement in care and successful attainment of viral suppression (Figure 23).

FIGURE 23

**Five out of seven people living with HIV in Milwaukee were virally suppressed during 2021.**

HIV care continuum\* - Retention and care outcomes, Milwaukee, 2021



\*Reflects laboratory data received through August 29, 2022

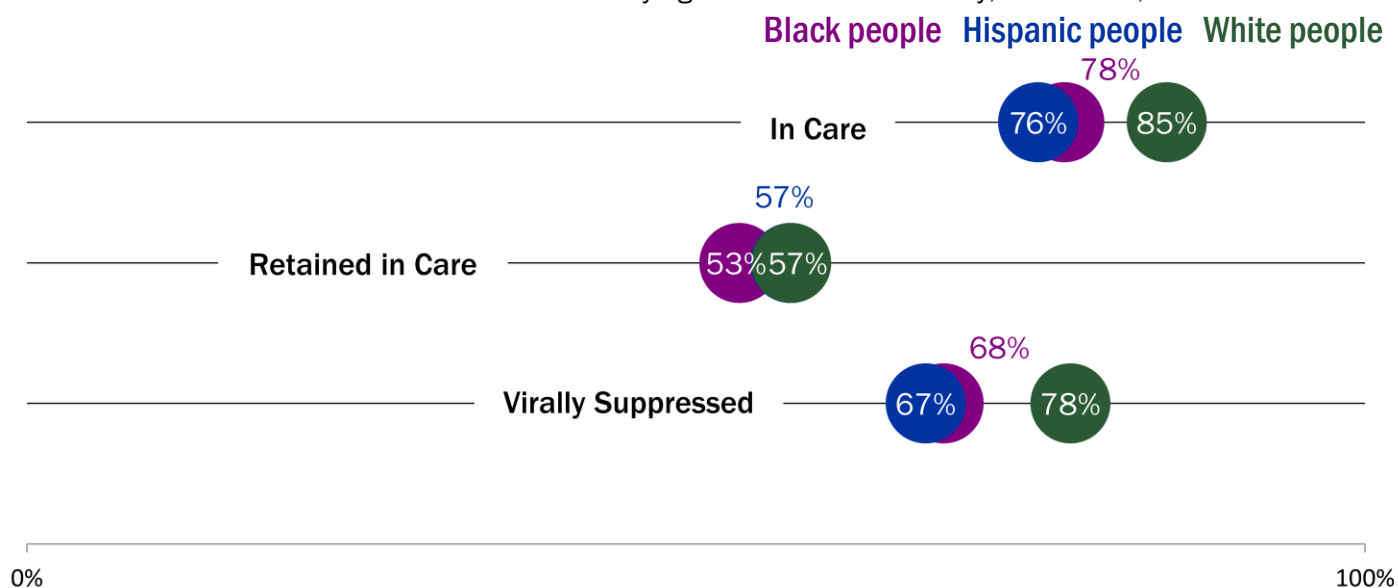
Cisgender women in Milwaukee were more likely to be in care and retained in care than cisgender men in 2021 although there was no difference in viral load suppression rates.

Similar to national data, there are disparities in HIV care by race and ethnicity in Milwaukee. Hispanic and Black people are less likely than White people to meet the desired outcomes across the care continuum with the exception of timely linkage to care and retention. Black people were also the least likely of the three racial/ethnic groups to be virally suppressed among those tested.

FIGURE 24

**With the exception of retained in care, White people over the age of 30 had better care continuum outcomes than Black and Hispanic people over the age of 30.**

HIV care continuum\* – Retention and care outcomes by age and race and ethnicity, Milwaukee, 2021



The overall trends by race and ethnicity mostly held true for adults ages 30 and older (Figure 24). White people were more likely to be in care and virally suppressed than both Black and Hispanic people. There was no difference among retention in care between the racial and ethnic groups. The only meaningful differences in care outcomes between racial and ethnic groups for younger individuals, ages 13–29, was that White people were more likely to be in care than Black or Hispanic people.

# Technical Notes

## Background

This report was prepared by the Wisconsin HIV Program. Wisconsin statutes require health care providers and laboratories to report confirmed or suspected HIV cases. Data in this report are compiled from laboratory results and report forms completed by health care providers. Risk information is self-reported by patients.

HIV reporting in Milwaukee is estimated to capture 99% of diagnosed individuals, but completeness of reporting may vary by geographic region, transmission category, and demographic group. Data reported here are based on the information available as of May 2022. Results are provisional and subject to change as additional information becomes available.

## New Diagnoses

New HIV diagnoses are included in the annual report if they meet all of the following criteria:

- The person was diagnosed with HIV during the year of analysis.
- The person was a resident of the city of Milwaukee at the time of diagnosis.
- Wisconsin is the earliest state of verifiable report. People who report being first diagnosed with HIV in another country, but whose diagnosis cannot be definitively documented, are included as new diagnoses. These practices conform to CDC's guidelines for residency assignment.

## Prevalence

### Observed Prevalence

People living with HIV are included in the observed prevalence if they meet the following criteria:

- The person was confirmed to be living with HIV.
- The person was presumed to be alive at the end of the analysis year.
- The last known address available for the person is a Milwaukee address.

Because of delays in reporting deaths to local and national databases, the number of people presumed alive should be considered provisional. Due to periodic data cleaning, prevalence may decrease as individuals thought to be living with HIV in Milwaukee are found to be deceased or living elsewhere.

## Estimated Prevalence

The estimated prevalence is a measure that takes into account that a proportion of individuals who are living with HIV are not aware of their diagnosis. The calculation consists of:

- Number of people known to be living with HIV.
- Estimated proportion of people living with HIV who are unaware.

The estimated prevalence is calculated as:

$$\frac{\text{Number known to be living with HIV}}{\text{Proportion unaware}}$$

## Rates

In this report, rates are defined as the number of cases per 100,000 people, except if noted otherwise. Population denominators used to calculate rates are from the Milwaukee Interactive Statistics on Health website (<https://www.dhs.wisconsin.gov/wish/index.htm>).

Rates published by the CDC for Wisconsin, Milwaukee, and Madison cannot be compared to those prepared by the Division of Public Health and local health departments because they may use different data sources.

## Demographic Variables

### Age

For new diagnoses, age refers to the age at the time of HIV diagnosis. For people living with HIV, age refers to the age on December 31 of the year of analysis.

### Gender

Consistent with the Council of State and Territorial Epidemiologists' position statement on transgender HIV surveillance,<sup>3</sup> this report uses gender identity rather than sex at birth.

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<sup>3</sup> Council of State and Territorial Epidemiologists. Transgender HIV Surveillance. 17-ID-06. <http://c.ymcdn.com/sites/www.cste.org/resource/resmgr/2017PS/2017PSFinal/17-ID-06.pdf>. Accessed May 10, 2019.

Gender is determined based on information in surveillance records. Individuals are counted as transgender for this report if they identified as transgender on an HIV report or laboratory document, or if there was a mismatch in birth sex and the sex or gender reported on any of the previously mentioned documents.

During 2021, transgender gender identity was not further verified; therefore, some individuals may be mistakenly counted as a transgender person in this report if sex or gender was incorrectly reported on any document or if data entry errors occurred. When information is available, surveillance staff may confirm gender identity when collecting report information from medical providers and public health officials.

## Race and ethnicity

Generally, CDC uses race and ethnicity terminology aligning with the 1997 Office of Management and Budget (OMB) standards<sup>4</sup> on race and ethnicity. At a minimum, data on the following race categories are collected: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, and White. For the purpose of this report, Native American is used to describe persons reported with a race of American Indian or Alaska Native. In addition to data on race, data on two categories of ethnicity should be collected: Hispanic or Latino and not Hispanic or Latino.

This report also presents data for persons for whom multiple race categories are reported. In this report, persons categorized by race were not Hispanic or Latino. Conversely, people who identify their origin as Hispanic, Latino, or Spanish may be of any race and they are referred to as “Hispanic” in this report.

## Residency

People who meet the definition of newly diagnosed (see *New Diagnoses* section above) are assigned to the county of residence listed on the HIV report form when first diagnosed and reported with HIV.

People who meet the prevalence definition (see *Prevalence* section above) are assigned to the county of their last known address.

## Vital Status

Information about deaths is obtained from the Wisconsin Vital Records Office, the National Death Index, and the Social Security Death Master File. Deaths described in this report include only those that occurred in Wisconsin among people living with HIV. Deaths are described as being due to HIV, or caused by HIV, if HIV was listed as the underlying cause of death on the death certificate. Deaths are described as being due to other causes if HIV was not listed as the underlying cause of death. However, HIV may have been listed as one of the 19 possible contributing causes of death.

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<sup>4</sup> Office of Management and Budget. Revisions to the standards for the classification of federal data on race and ethnicity. Federal Register 1997;62:58782-58790. <https://www.govinfo.gov/content/pkg/FR-1997-10-30/pdf/97-28653.pdf>. Accessed August 2022.

## Transmission Category

### Observed Transmission Category

*Transmission category* is the term that summarizes a person's possible HIV risk factors; the summary category results from selecting, from a hierarchical order of probability, the single risk factor most likely to have been responsible for transmission. For surveillance purposes, a diagnosis of HIV is counted only once in the hierarchy of transmission categories. Persons with more than one reported risk factor for HIV are classified in the transmission category listed first in the hierarchy. The exception is men who had sexual contact with other men and injected drugs; this group makes up a separate transmission category. Transmission categories are defined as follows:

- Male-male sexual contact includes men who have ever had sexual contact with other men and men who have ever had sexual contact with both men and women.
- Male-female sexual contact includes persons who have ever had male-female sexual (heterosexual) contact with a person known to have been diagnosed as living with HIV or an increased risk for HIV (for example, someone who injects drugs). The male-female contact category excludes men who have ever had sexual contact with both men and women.
- Injection drug use includes persons who have ever reported injecting drugs.
- Unknown includes people without a risk factor listed in the hierarchy of transmission categories. People may have an unknown transmission category because they did not identify risk behaviors, identified risk behaviors not part of the transmission hierarchy, died before they could be interviewed, or were lost to follow-up and could not be interviewed.
- The category "Other" is used to group less common transmission categories, including people with hemophilia, people who were exposed to HIV through a blood transfusion or tissue/organ transplant, and other pediatric transmission categories.
- Perinatal transmission refers to HIV transmitted during the perinatal period, which spans from 22–28 weeks of gestation to seven days after birth. This category is also used for children presumed to be exposed during breastfeeding.
- Sexual contact includes transgender persons exposed to HIV through sexual contact.

### Imputed Transmission Category

Some people diagnosed with HIV are reported in Milwaukee with insufficient risk information to assign a transmission category. Multiple imputation is a statistical method in which the known transmission categories of individuals with similar demographic characteristics are used to estimate the most plausible values for those with unknown transmission category (See Box 1).

Counts estimated by imputed transmission category are reported rounded to the nearest whole number of people but are still considered to be estimates, not counts. Imputed transmission categories may change as new information becomes available. This method conforms to the CDC's method of addressing people with unknown transmission category.



**Box 1: Multiple Imputation Example**

Assuming 30 women aged 45–64 were diagnosed with HIV, 18 of them had diagnoses attributed to male–female sexual contact; nine had diagnoses attributed to injection drug use; and three had unknown transmission categories. The 27 known transmission categories are applied to the three people with an unknown transmission category. Of the three persons with an unknown transmission category, two are assigned 67% male–female sexual contact and one 33% injection drug use. To conclude, two persons with unknown transmission risk are estimated to have male-female sexual contact risk and one person an injection drug use risk.



## HIV Stage at Diagnosis

### Recent and Acute HIV Diagnosis

Recent HIV is defined as having been diagnosed during the six months after HIV was acquired. Recent HIV is suspected when a newly diagnosed individual reports a negative test within the previous six months, or when the initial viral load test is high.

Acute HIV is defined as having been diagnosed with HIV in the two to four weeks after HIV was acquired. This time period immediately after acquiring HIV is characterized by high viral load, undetectable HIV-1 antibodies, and presence of viral nucleic acids (that is, RNA) or p24 antigen.

### Late (Stage 3) HIV Diagnosis

In this report, an HIV case is any person with laboratory-confirmed HIV infection. This includes HIV and Stage 3 HIV (AIDS) diagnosis. People diagnosed with Stage 3 HIV infection include only those that meet the CDC's Stage 3 HIV surveillance definition.

According to the CDC, late diagnosis occurs among individuals who progress to Stage 3 HIV (AIDS) within one year of receiving their initial HIV diagnosis, including those progressed to Stage 3 by the time they are first diagnosed with HIV. Stage 3 HIV typically occurs eight to 10 years after acquiring HIV in the absence of treatment, and is clinically defined by a very low CD4 count or a Stage 3-defining opportunistic infection.

During 2014, the Stage 3 surveillance definition changed to exclude individuals with a Stage 3-defining CD4 count (<200 cells/mL) if a negative HIV test in the previous six months has been documented. Instead, the low CD4 count may reflect recently acquired HIV. Individuals may be incorrectly classified as having progressed to Stage 3 if recent negative tests are not documented. Collection of recent negative tests has improved over time.

## Statistical Significance

Statements about statistical significance are sometimes made when looking at a change over time or when comparing groups. Tests of statistical significance determine whether the observed trend or difference is due to chance or is a true pattern. Linear regression on rolling three-year averages was used to assess trends over time and chi-squared analysis was used to assess differences between groups. Statements about increasing or decreasing trends or differences between groups are only made if the pattern is statistically significant.

# Appendix

TABLE A1

Number of new HIV diagnoses per 100,000 people by year of diagnosis, gender, and race or ethnicity, Milwaukee, 2012–2021

Year	Cisgender Men			Cisgender Women		
	Black	White	Hispanic	Black	White	Hispanic
2012	42.8	13.4	28.5	10.9	*	*
2013	45.9	18.2	24.5	10.2	*	*
2014	62.5	11.7	32.7	6.3**	*	9.4**
2015	52.6	16.2	19.5**	5.5**	*	*
2016	58.7	5.8**	20.8	9.6	*	*
2017	55.0	15.7	29.8	10.2	*	*
2018	51.7	8.9**	31.3	8.2**	*	*
2019	55.1	9.9**	25.7	13.0	*	*
2020	44.8	12.1	20.3	11.5	*	*
2021	38.8	11.1**	35.5	9.0**	*	*

\* Rates based on counts less than five have been suppressed.

\*\* Rates are statistically unreliable due to counts less than 12.

TABLE A2

Geographic distribution of new HIV diagnoses by zip code of diagnosis, Milwaukee, 2019–2021

<b>Zip Code of Residence</b>	<b>Number</b>	<b>Percent of Cases</b>
53204	33	10.9%
53209	26	8.6%
53225	26	8.6%
53215	23	7.6%
53210	22	7.3%
53216	20	6.6%
53208	19	6.3%
53212	17	5.6%
53218	15	5.0%
53224	13	4.3%
53233	13	4.3%
53206	12	4.0%
53207	12	4.0%
53202	11	3.6%
53223	10	3.3%
53214	5	1.7%
53205	4	1.3%
53219	4	1.3%
53226	4	1.3%
53211	3	1.0%
53227	3	1.0%
53221	2	0.7%
53201	1	0.3%
53203	1	0.3%
53213	1	0.3%
53220	1	0.3%
53222	1	0.3%
53228	1	0.3%
<b>TOTAL</b>	<b>303</b>	<b>100%</b>

TABLE A3

Comparison of new HIV reports by location of diagnosis, Milwaukee, 2021

	Diagnosis Location	
	Milwaukee Number (%)	Migration into Milwaukee Number (%)
<b>Total</b>	100 (100%)	47 (100%)
<b>Current Gender</b>		
Cisgender Men	72 (72%)	40 (85%)
Cisgender Women	16 (16%)	5 (11%)
Transgender Women	12 (12%)	2 (4%)
<b>Median Current Age (Range)</b>	28.5 (17–69)	39 (19–73)
<b>Race and Ethnicity</b>		
Asian	1 (1%)	1 (2%)
Native American	1 (1%)	0 (0%)
Black	60 (60%)	20 (43%)
Hispanic	23 (23%)	10 (21%)
White	12 (12%)	11 (23%)
Multiracial	3 (3%)	4 (9%)
<b>Transmission Category</b>		
Male–Male Sexual Contact (MMS)	53 (53%)	32 (68%)
Injection Drug Use (IDU)	3 (3%)	4 (9%)
MMS and IDU	0 (0%)	1 (2%)
Male–Female Sexual Contact	4 (4%)	4 (9%)
Unknown	40 (40%)	6 (13%)

TABLE A4

## Observed and Estimated Prevalence of People Living with HIV in Milwaukee, 2021

	United States Estimated % Unaware*	Milwaukee		
		Observed Prevalence	Estimated # Unaware**	Estimated Prevalence
<b>Total</b>	13.3%	2,860	439	3,299
<b>Age (years)</b>				
13–24	44.3%	114	91	205
25–34	28.5%	527	210	737
35–44	15.4%	524	95	619
45–54	7.5%	610	49	659
Greater Than 55	4.6%	1082	52	1134
<b>Race and Ethnicity</b>				
White	10.8%	558	68	626
Black	13.4%	1696	262	1958
Hispanic or Latino	16.4%	483	95	578
Multiracial	11.2%	72	9	81
Asian	13.5%	42	7	49
American Indian	20.4%	8	2	10
<b>Transmission Category</b>				
Male–Male Sexual Contact (MSM)	15.2%	1,802	323	2125
Male–Female Sexual Contact	12.9%	616	91	707
Injection Drug Use (IDU)	6.8%	291	21	312
MSM and IDU	8.2%	123	11	134

\* Centers for Disease Control and Prevention. Estimated HIV Incidence and Prevalence in the United States 2015-2019. HIV Surveillance Supplemental Report 2021;26 (No. 1). <https://www.cdc.gov/hiv/library/reports/hiv-surveillance.html>. Published May 2021. Accessed September 2021.

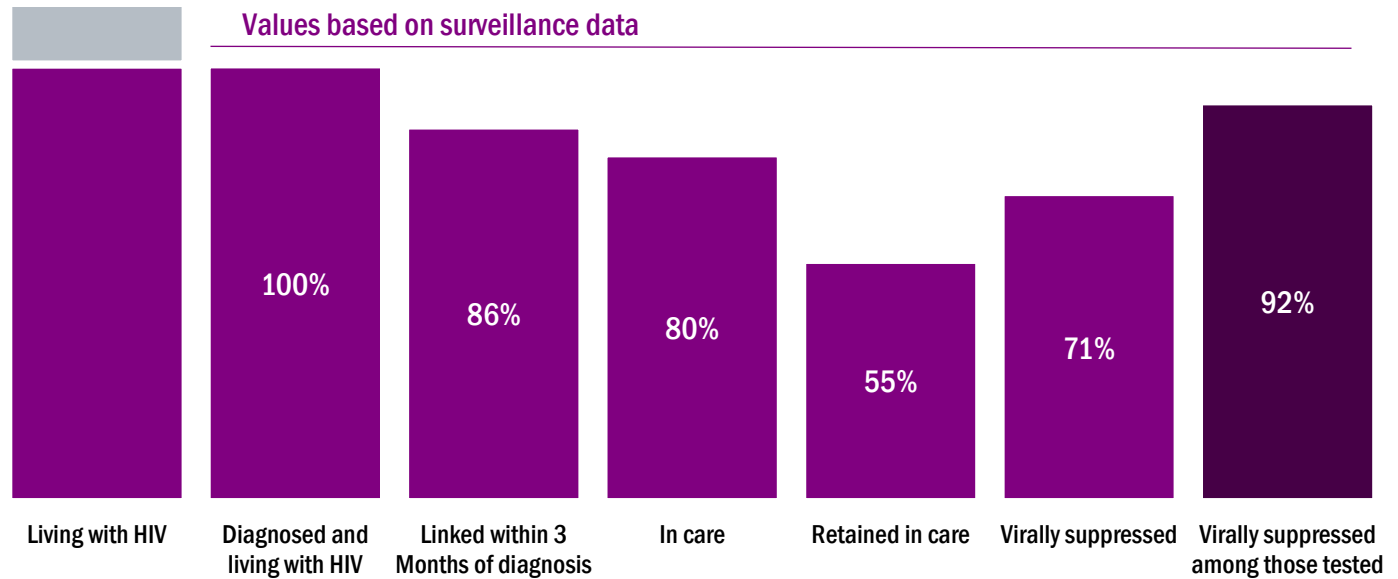
\*\* Details about calculation of estimated unaware and estimated prevalence can be found in the Technical Notes.

FIGURE A1

## The majority of people living with HIV who are engaged in care are virally suppressed.

HIV Care Continuum\*, Milwaukee, 2021

Estimated values



\*Reflects laboratory data received through August 29, 2022

### Estimated Values

**Living with HIV:** CDC estimates that 13.8% of individuals living with HIV in the U.S. are unaware of their status. This bar shows both those aware and diagnosed (purple) and those unaware of their HIV diagnosis (gray).

### Values Based on Surveillance Data

**Diagnosed and living with HIV:** All individuals reported living with HIV in Milwaukee by the end of 2020 that were still alive and living in Milwaukee by the end of 2021 (2,717 people).

**Linked within three months of diagnosis:** Of 100 people diagnosed with HIV in Milwaukee during 2021, 86% (86 people) were linked to care within three months of diagnosis. Three out of four (74/100 people or 74%) newly diagnosed individuals were linked to care within the one-month priority timeframe described in the most recent National HIV/AIDS Strategy.<sup>4</sup>

**In care:** Of 2,717 individuals diagnosed and living with HIV in Milwaukee during 2021, 80% had at least one medical visit that included one or more laboratory test that was available in the HIV surveillance system as evidence of receiving care.

<sup>4</sup> The White House. 2021. National HIV/AIDS Strategy for the United States 2022–2025. Washington, DC. <https://files.hiv.gov/s3fs-public/NHAS-2022-2025.pdf>. Accessed September 2022.

**Retained in care:** Of 2,717 individuals diagnosed and living with HIV in Milwaukee during 2021, 55% had laboratory test results that suggested two or more medical visits occurred at least three months apart during the reporting period. This criterion for retention in care may underestimate the number of people who are routinely receiving HIV care, as people who have been treated for many years or who are uninsured may receive care once a year or less and may still be adherent to care and attaining viral suppression.

**Virally suppressed:** Of 2,717 people living with HIV in Milwaukee, 71% had viral loads (a test that documents the number of virus copies in the blood) that were less than 200 copies/mL, indicating attainment of viral suppression. Individuals whose last viral load test was prior to 2021 or who did not have a viral load test recorded were considered to have unsuppressed viral loads.

**Virally suppressed among those tested:** Of 1,924 people who had a viral load test during 2021, 92% were virally suppressed at their last measurement. This suggests that most individuals receiving some medical care are achieving viral suppression. Viral suppression improves the health of the person living with HIV and also prevents them from transmitting HIV sexually to partners.



## **For more information, contact:**

Wisconsin HIV Program

Surveillance Unit

**Email:** [dhshivsurveillance@dhs.wisconsin.gov](mailto:dhshivsurveillance@dhs.wisconsin.gov)

Room 265

1 West Wilson Street,

Madison, WI 53703

<https://www.dhs.wisconsin.gov/hiv/index.htm>

