

# Wisconsin HIV Surveillance Annual Review Addendum: City of Milwaukee

New diagnoses, prevalence, syphilis diagnoses, and HIV testing  
through December 31, 2017

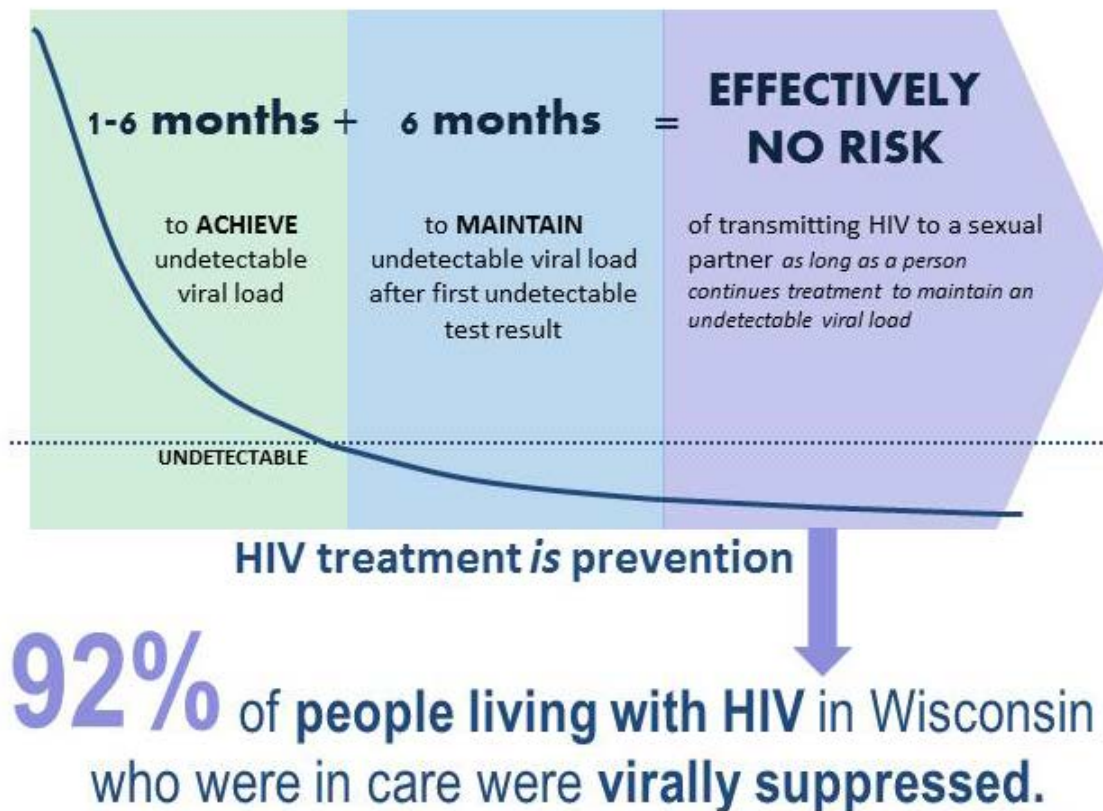


Figure modified from <https://www.niaid.nih.gov/news-events/10-things-know-about-hiv-suppression>



Wisconsin  
Department of Health Services

Division of Public Health  
AIDS/HIV Program  
P-00484A (September 2018)

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## Abbreviations

CDC	Centers for Disease Control and Prevention
DHS	Department of Health Services
DPH	Division of Public Health
PLWH	People living with HIV
PrEP	Pre-exposure prophylaxis

## Data Highlights

### New diagnoses in Milwaukee, 2017

**75%** Attributed to male-male sexual contact

**87%** Linked to care within three months of diagnosis

### Priority Populations

Although trends do not show a statistically significant increase over time, the following populations should be emerging priorities for monitoring rates of HIV:



People who inject drugs



Young Hispanic MSM



15-19 year olds

### Prevalence in 2017

**2,991** People living with diagnosed HIV

**73%** Received some care

**65%** Are virally suppressed

**600** Estimated people living with undiagnosed HIV

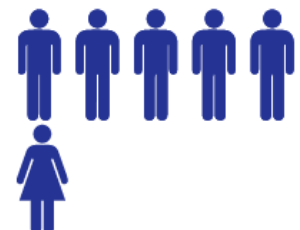
## Executive Summary

The city of Milwaukee HIV Surveillance Addendum is a supplemental report to the Wisconsin HIV Annual Review. The city of Milwaukee report presents data on people newly diagnosed with HIV during 2017, people living with HIV (PLWH) in Milwaukee as of December 31, 2017, syphilis diagnoses, and information on HIV testing in Milwaukee during 2017. Reporting annually on HIV surveillance data is important for policy makers, program planners, HIV service providers, and the public to enable effective planning of HIV prevention and care services and ensure efficient use of resources. For planning HIV prevention, testing, and linkage strategies, it is important to focus on new diagnoses among Milwaukee residents—those individuals for whom HIV might have been prevented or identified earlier. When planning care and treatment services, the focus should be on PLWH irrespective of where they were first diagnosed. Throughout this report, “Milwaukee” refers to the city of Milwaukee unless otherwise specified.

## New Diagnoses

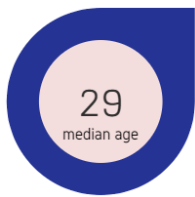
**Trend:** During 2017, 118 people were newly diagnosed with HIV in Milwaukee. Between 2008 and 2017, both the number and the rate of new diagnoses fluctuated with no clear trend. The number of new diagnoses over the last decade ranged from a low of 102 (2012) to a high of 136 (2010), with an average of 116 new diagnoses per year. Of metropolitan statistical areas (MSA)—geographical regions with relatively high population density at their core—the Milwaukee HIV diagnosis rate ranked 75th out of 108 MSAs in 2016.

**Sex:** Five times as many males as females were diagnosed with HIV (98 males and 19 females). Between 2008 and 2017, the HIV diagnosis rate decreased among females ages 30-59. For all other sex and age groups, the diagnosis rate was stable.



**Gender:** Since 1985, 39 transgender individuals have been diagnosed with HIV in Milwaukee. During 2008–2017, there were 27 new HIV diagnoses in transgender people, of which 15 were Black, 11 were Hispanic, and 18 were under age 30 at the time of diagnosis.

**Racial/ethnic groups:** HIV disproportionately affects people of color in Milwaukee. During 2017, 83% of new diagnoses were among people of color, despite people of color making up approximately 55% of Milwaukee’s population. During 2013-2017, the HIV diagnosis rate was fourfold higher among Black males, twofold higher among Hispanic males, and twofold higher among American Indian males compared to White males. The HIV diagnosis rate was sixfold higher among Black females and almost threefold higher among Hispanic females compared to White females.



**Age:** The median age at HIV diagnosis was 29 years of age but varied considerably by transmission category. The median age at diagnosis was 26 years for males with diagnosed HIV attributed to male-male sexual contact, 44 years for males and females with HIV attributed to heterosexual contact, and 39 years for males and females with HIV attributed to injection drug use.

**Transmission category:** After adjusting for unknown transmission category, 75% of new diagnoses were attributed to male-male sexual contact, 16% were attributed to heterosexual contact, and 8% were attributed to injection drug use. From 2008 to 2017, the number of HIV diagnoses attributed to male-male sexual contact or injection drug use was stable while the number attributed to heterosexual contact declined.

**Geography:** Nine Milwaukee zip codes each had 20 or more HIV diagnoses over the past three years and accounted for more than half of all new diagnoses among Milwaukee residents during 2015-2017 (53209, 53208, 53216, 53212, 53218, 53210, 53215, 53206, and 53204).



**HIV stage at diagnosis:** Nearly one in five people diagnosed with HIV during 2017 were identified within six months after likely acquiring HIV, which allows for early initiation of anti-retroviral medications, and potentially fewer opportunities for transmission. On the other hand, one in 10 people were diagnosed long after acquiring HIV, and had already progressed to Stage 3 HIV (AIDS) by the time of diagnosis or within 12 months after diagnosis. However, the proportion of individuals with late diagnosis declined from 2013 (31%) to 2017 (11%).

**Diagnosed outside of Wisconsin:** In addition to the 118 Milwaukee residents diagnosed with HIV during 2017, 48 individuals previously diagnosed with HIV moved to Milwaukee from another state or country. The number of people living with HIV who migrate to Wisconsin continues to grow each year. This is important in that all states receive federal funding, based in part on the number of people diagnosed with HIV in the state, to support HIV care services for low income people living with HIV. People who receive care in Wisconsin, but were not

diagnosed in Wisconsin, are not considered when determining the amount of federal funding Wisconsin receives to provide HIV care services.

## People living with HIV

As of the end of 2017, 2,991 individuals reported with HIV were presumed to be alive and living in Milwaukee. The Centers for Disease Control and Prevention (CDC) estimates that 16.7% of people living with HIV (PLWH) in Wisconsin are unaware of their HIV status. This means that an estimated 600 individuals in the city are potentially living with undiagnosed HIV, so the total number of PLWH in Milwaukee is estimated to be nearly 3,600.

**HIV Care Continuum:** Eighty-seven percent of people diagnosed with HIV in Milwaukee during 2017 were linked to care within three months of diagnosis. Of people living with HIV in Milwaukee, 73% received some care during 2017, 56% had two or more care visits, and 65% were virally suppressed.

## Implications

### HIV diagnoses

Trends in people first diagnosed in Milwaukee should guide planning for HIV prevention. The number of new diagnoses among MSM is stable overall, but young MSM, especially young Black MSM, continue to be disproportionately impacted. HIV rates should also be closely monitored for young Hispanic MSM. These results suggest that men who have sex with men, and especially young men of color, should continue to be the top priority for HIV prevention efforts in Wisconsin.

Maintaining efforts to prevent HIV attributed to heterosexual contact and injection drug use is also important. While the number of new HIV diagnoses attributed to injection drug use was on the decline until 2016, as of 2017 this number is no longer declining. In addition, hepatitis C diagnoses and overdose due to injection drug use are on the rise among young adults in rural parts of Wisconsin. These trends underscore the risk that HIV diagnoses could increase among people who inject drugs. Thus it is important to support overall health among people who use drugs to prevent both HIV and hepatitis C.

### HIV prevalence

HIV prevalence data should guide planning for HIV care and treatment services. The fact that 49% of the PLWH in Wisconsin are age 50 or older indicates that HIV care providers must attend to patients' health conditions related to aging as well as their HIV.

On the HIV care continuum, viral suppression continues to be an important focus. Data now show that people living with HIV whose viral loads are undetectable do not transmit HIV sexually to partners. Care providers should share this message with their patients to decrease the stigma associated with HIV and motivate them to stay in care.

**For additional information**

The AIDS/HIV Program website (<https://www.dhs.wisconsin.gov/aids-hiv/data.htm>) includes annual surveillance summaries and other reports regarding HIV.

CDC's HIV surveillance web page: <http://www.cdc.gov/hiv/statistics/index.html>

General information about HIV prevention and care services in Wisconsin: <https://www.dhs.wisconsin.gov/aids-hiv/index.htm>

Information about hepatitis C: <https://www.dhs.wisconsin.gov/viral-hepatitis/hcv-program.htm>



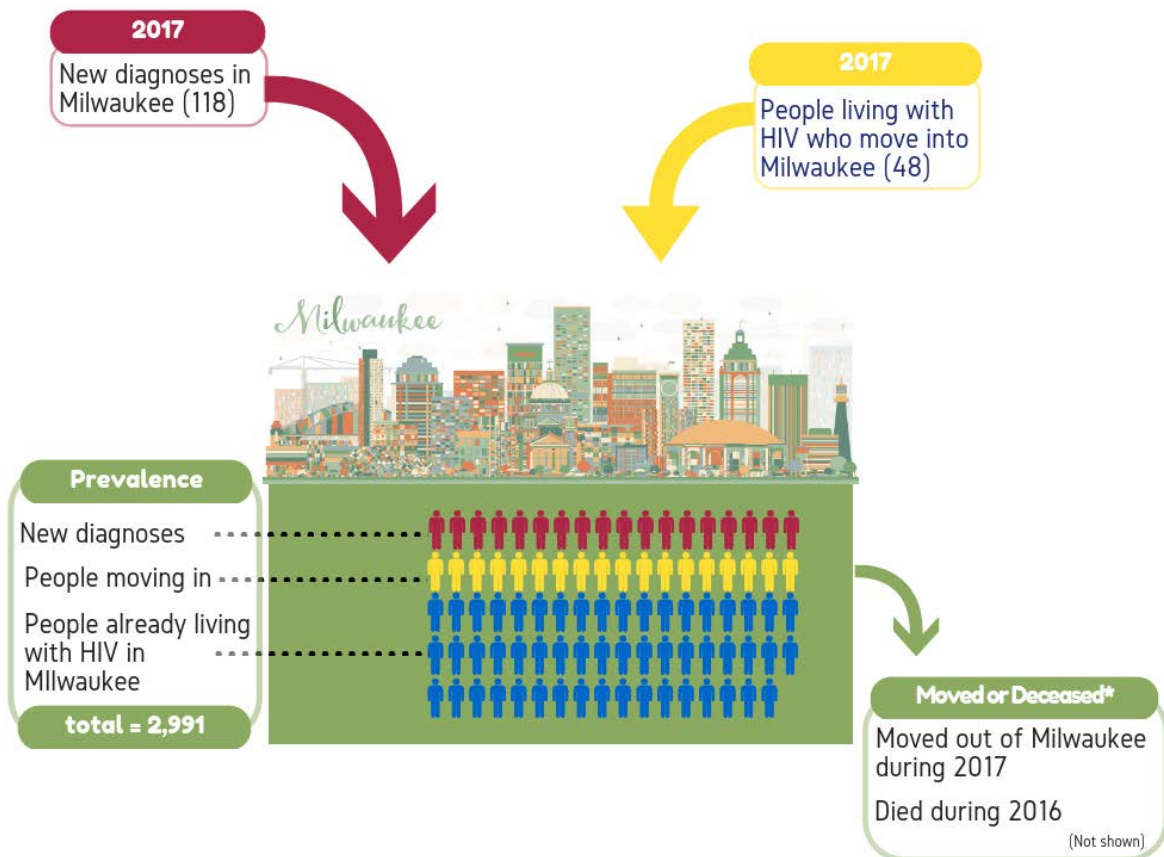
## New Diagnoses and Prevalence Definitions

### Introduction

This report serves as an addendum to the report: *Wisconsin HIV Surveillance Annual Review: New Diagnoses, Prevalent Cases, and Deaths through December 31, 2017*, which can be accessed at <https://www.dhs.wisconsin.gov/publications/p00484.pdf>. This report provides HIV surveillance data for Milwaukee. Throughout this report, “Milwaukee” refers to the city of Milwaukee unless otherwise specified. For more information about the definitions and methods used for this report, please see the technical notes section.

**New diagnoses** refer to those individuals who received their first verifiable HIV diagnosis while residing in Milwaukee. During 2017, there were 118 new diagnoses of HIV among Milwaukee residents (Figure 1). In addition, there were 48 individuals already diagnosed with HIV who moved to Milwaukee and were reported during 2017. These individuals are not included in the analysis of new diagnoses but are described in the In-Migration section of the report; they are also included in the prevalence estimate if they were still alive and living in Milwaukee at the end of 2017.

**Figure 1: Flow of people with HIV in and out of Milwaukee, 2017**



\*Specific breakdown of the number of persons who died and moved to another city or state are not available at the city-level death; see statewide report for summary of deaths of people living with HIV during 2017.

Wisconsin does not receive federal funding to conduct incidence surveillance so data are not available to determine when HIV was *acquired*, only when it was *diagnosed*. Therefore, the term *incidence* is not used in this report.

**Prevalence** refers to PLWH whose last known address in the HIV surveillance database was in Milwaukee, and for whom the surveillance program has no evidence of death. Address information is obtained from HIV reports, laboratory records, death certificates, and other states' HIV surveillance programs.

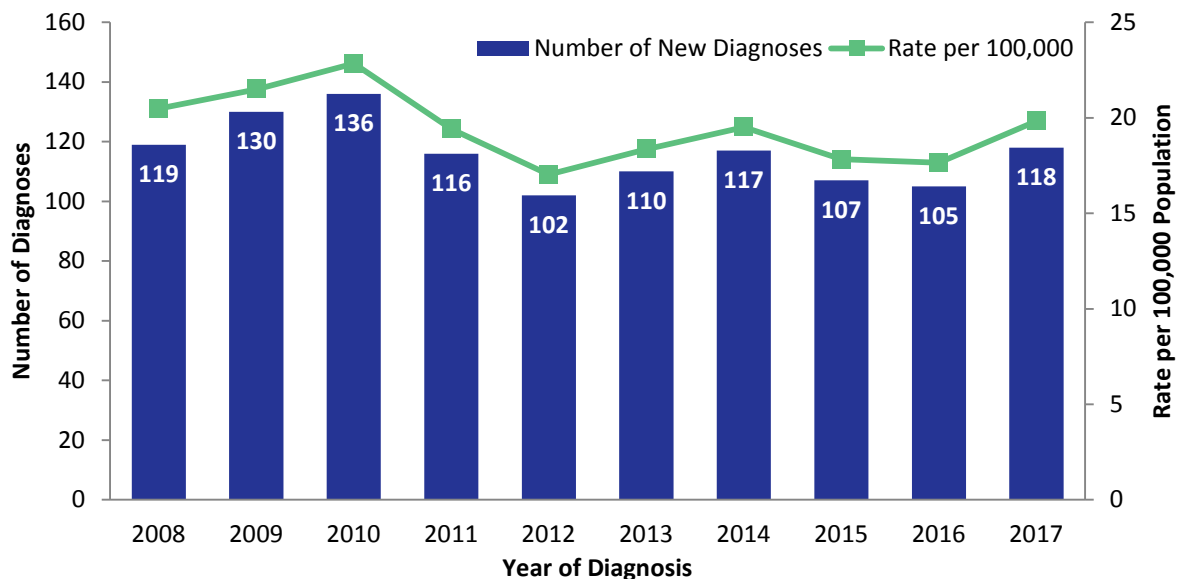
As of the end of 2017, 2,991 individuals reported with HIV were presumed to be alive and living in Milwaukee. The Centers for Disease Control and Prevention estimates that 16.7% of PLWH in Wisconsin are unaware of their HIV status, and therefore the actual prevalence of HIV in Milwaukee is likely closer to 3,600.

## New Diagnoses

### Number and rate

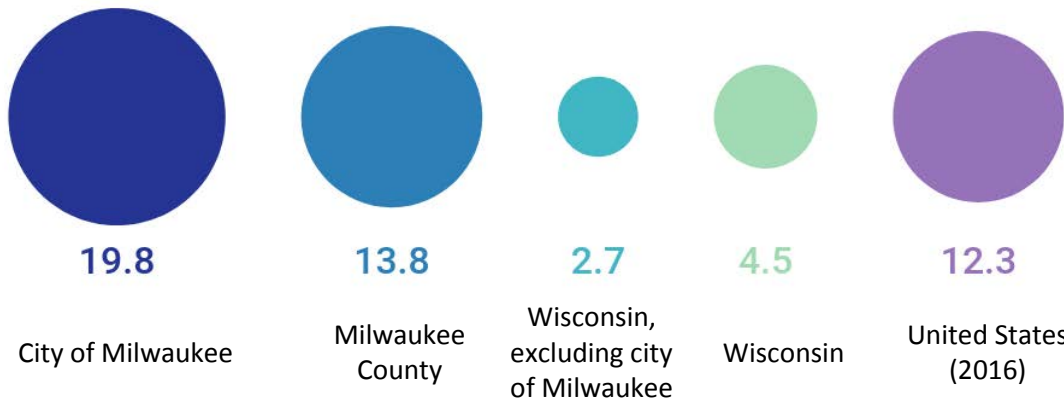
There were 118 new HIV diagnoses among Milwaukee residents during 2017, corresponding to an HIV diagnosis rate of 19.8 per 100,000 population. Between 2008 and 2017, both the number and the rate of new diagnoses fluctuated with no clear trend. The number of new diagnoses over the last decade ranged from a low of 102 (2012) to a high of 136 (2010), with an average of 116 new diagnoses per year (Figure 2).

**Figure 2: Number and rate of new HIV diagnoses, Milwaukee, 2008-2017**



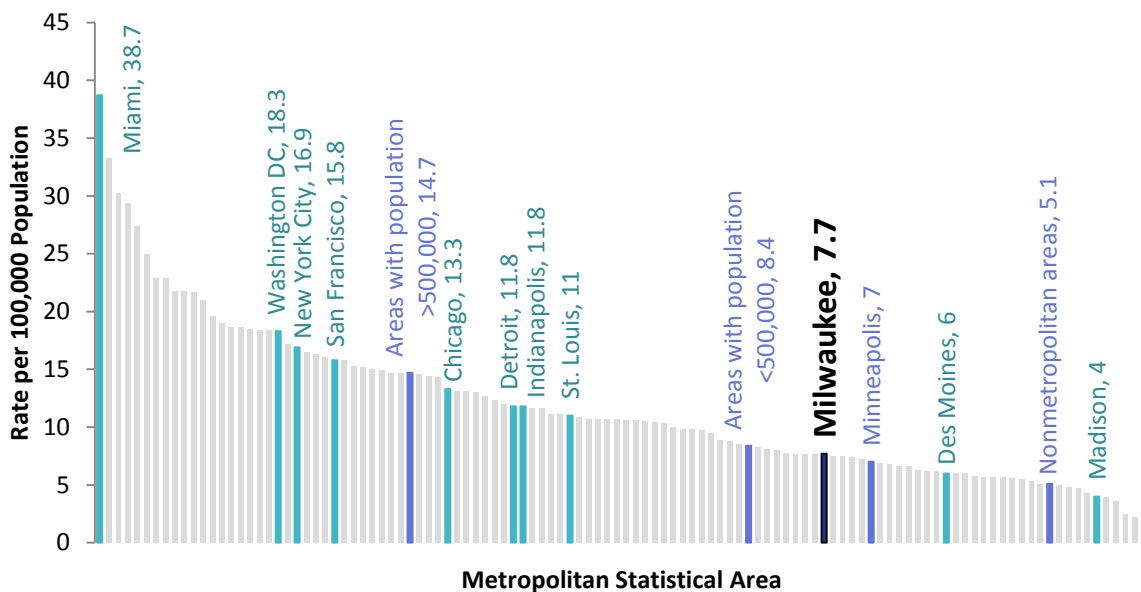
Milwaukee is disproportionately affected by HIV, as the city makes up just 10% of the state’s population yet 46% of people newly diagnosed with HIV in 2017. The diagnosis rate was seven times higher than the rate for the rest of Wisconsin (excluding the city of Milwaukee [2.7 per 100,000]) and was higher than that for the nation as a whole (12.3 per 100,000) (Figure 3).

**Figure 3: HIV diagnosis rate per 100,000 population, Milwaukee compared to other geographies, 2017**



Of metropolitan statistical areas (MSA)—geographical regions with a relatively high population density at their core—the Milwaukee area (includes Waukesha and West Allis) HIV diagnosis rate ranked 75th out of 108 MSAs in 2016 (Figure 4). Note that the city of Milwaukee rate reported above (19.8 per 100,000) is much greater than the Milwaukee MSA rate (7.7 per 100,000) due to the fact that the other cities included in the MSA have lower HIV rates. Nearby MSAs with lower HIV diagnosis rates include Minneapolis (7), Des Moines (6), and Madison (4).

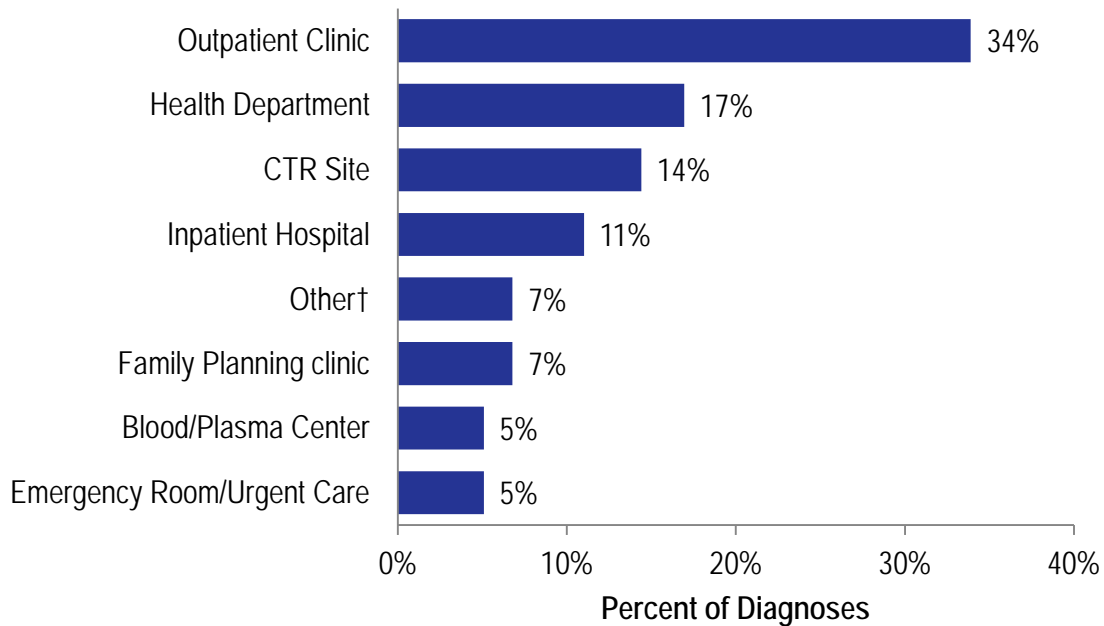
**Figure 4: Estimated HIV diagnosis rate by metropolitan statistical area, 2017**



## Type of facility providing diagnosis

During 2017, the most common settings for HIV diagnoses in Milwaukee were outpatient clinic (34%), local health department (17%) and counseling, testing and referral (CTR) site (14%) (Figure 5).

**Figure 5: Percent of diagnoses by facility of HIV diagnosis, Milwaukee, 2017**

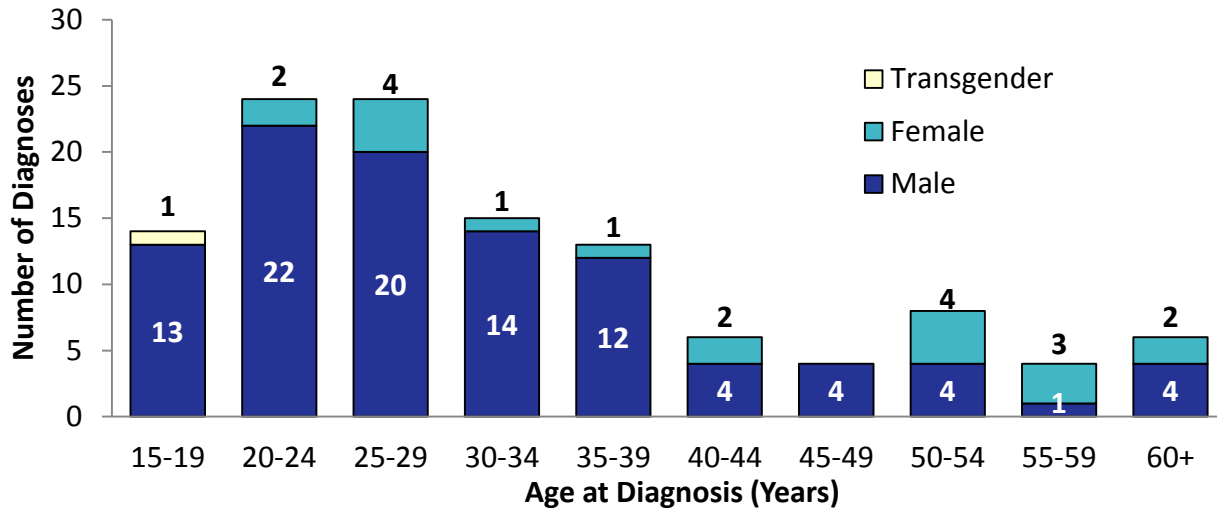


†Other includes diagnosis at an HIV clinic, jail, direct access testing facility, or life insurance.

## Gender and age at diagnosis

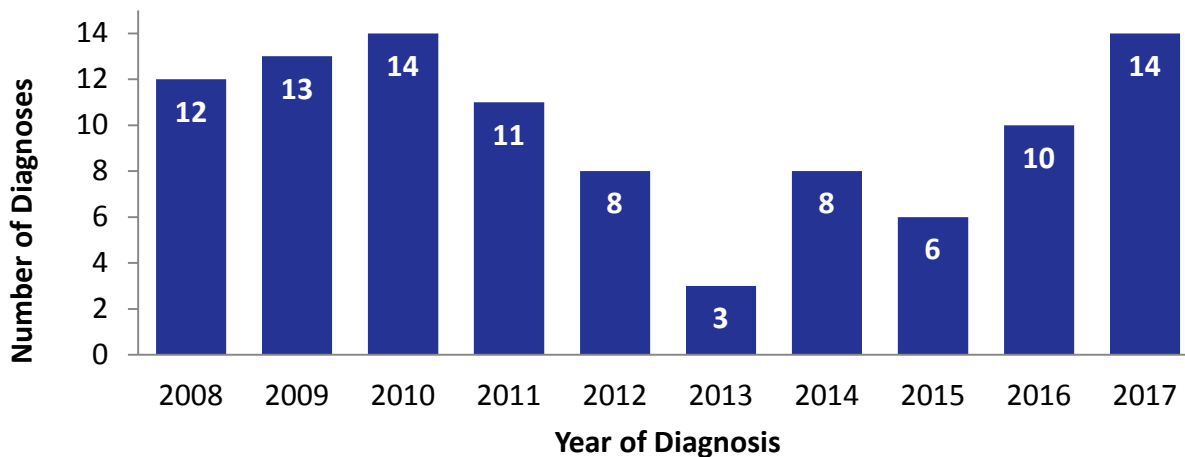
During 2017, 98 males, 19 females, and 1 transgender person were diagnosed with HIV in Milwaukee. The median age at diagnosis (the age at which half of people were older at the time of diagnosis and half were younger) was 29 years, with a range of 16-67 years. Newly diagnosed males were younger than newly diagnosed females. The median age at diagnosis was 27 years for males and 44 years for females. Age at diagnosis by gender is shown in Figure 6.

**Figure 6: Number of HIV diagnoses by age and gender, Milwaukee, 2017**



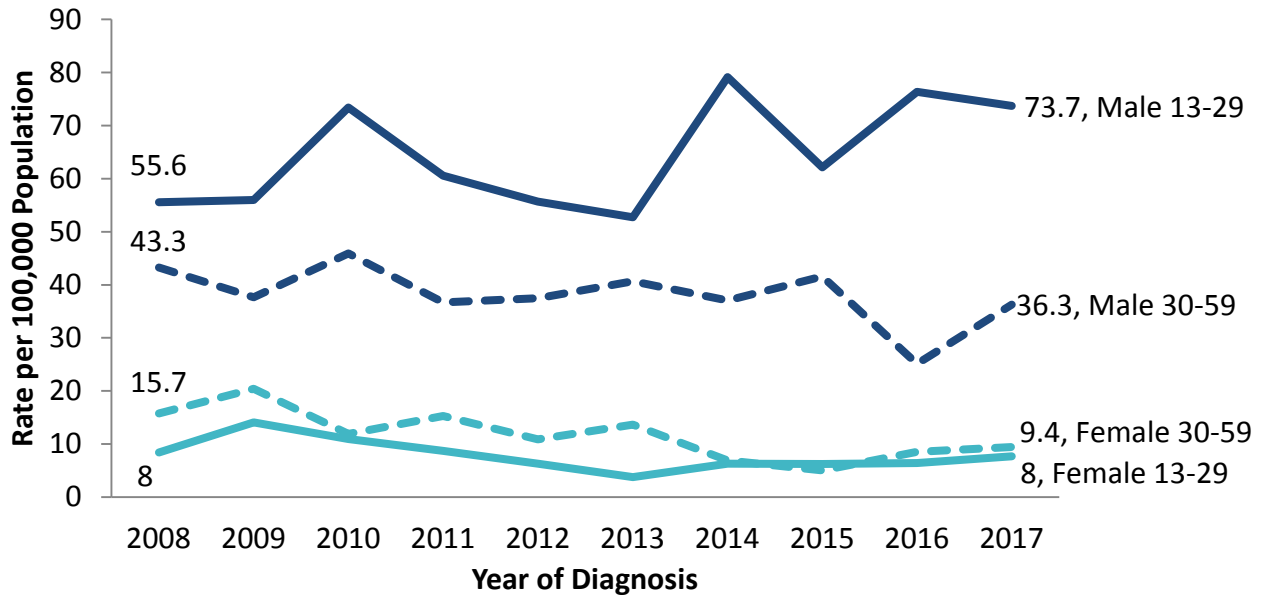
There were 14 individuals ages 15-19 years diagnosed with HIV in Milwaukee during 2017. While there was no clear trend from 2008-2017, the number has been increasing in recent years (Figure 7).

**Figure 7: Number of diagnoses among youth ages 15-19 years, Milwaukee, 2008-2017**



Over the last decade (2008-2017), the HIV diagnosis rate fluctuated across most age and gender groups, including males ages 13-29, males ages 30-59, and females ages 13-29 (Figure 8). There was a significant decrease among females ages 30-59. Diagnosis rates among males and females ages 60 and older are unreliable due to small numbers. There were 27 transgender individuals excluded from this analysis as population denominators are not available to calculate rates.

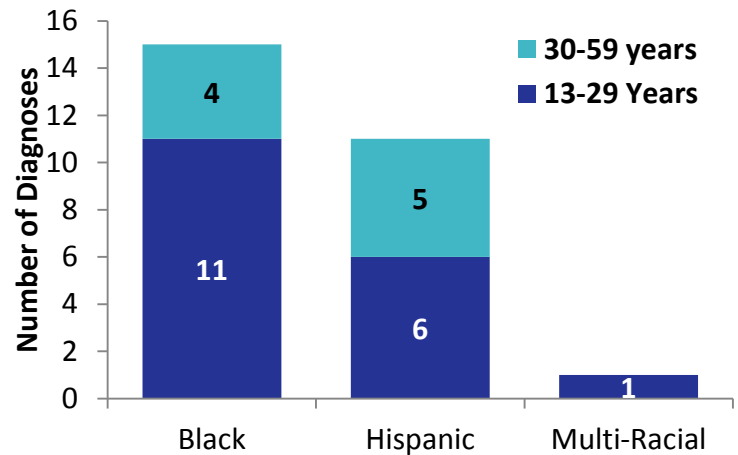
**Figure 8: HIV diagnosis rate by age at diagnosis and gender, Milwaukee, 2008-2017**



### Transgender identity

The term “transgender” refers to people whose gender identity does not conform to their sex assigned at birth. It includes people who self-identify as male-to-female or transgender women, female-to-male or transgender men, and many other gender nonconforming identities. A transgender person may have the anatomy of their sex at birth, the other sex, or a combination. 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.

**Figure 9: Number of HIV diagnoses among transgender individuals by age at diagnosis and race/ethnicity, Milwaukee, 2008-2017**



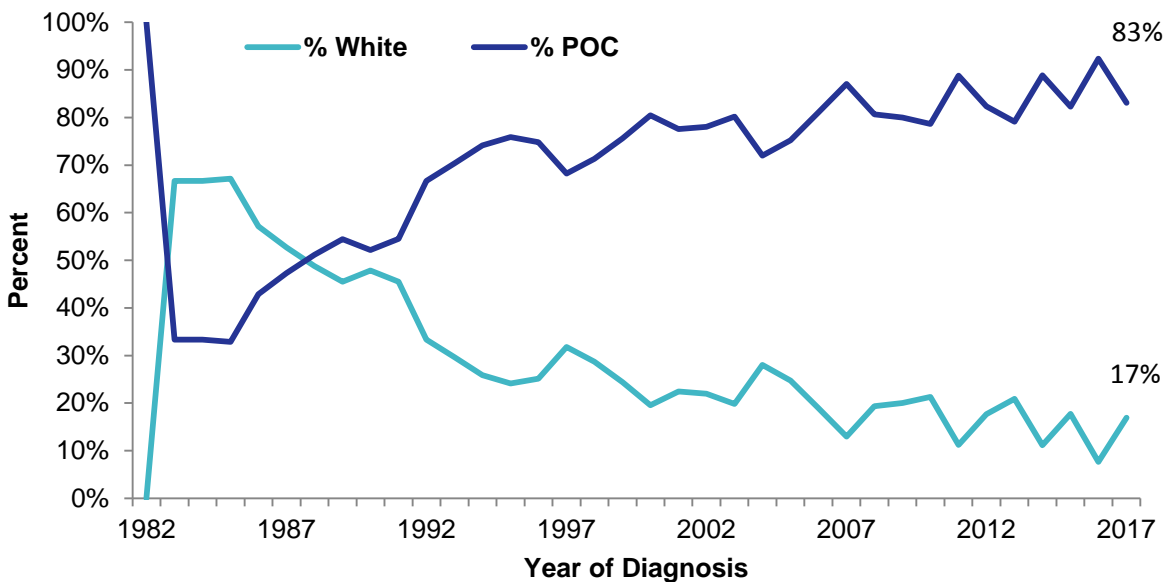
A total of 39 transgender individuals have been diagnosed with HIV in Milwaukee since the beginning of the epidemic (three female-to-male and 36 male-to-female). While the data collection of self-reported gender identity has improved over time, this likely underestimates the true number of transgender individuals diagnosed with HIV in Milwaukee (see Technical Notes for additional information on how transgender identity is determined). Of the 39 diagnoses, 27 occurred between 2008 and 2017 (Figure 9). Of these, all were people of color and most were under age 30 (n=18). For a variety of reasons, transgender people are at high risk of HIV, including barriers faced in health care settings due to providers’ lack of training on transgender

people’s unique needs; stigma, discrimination, social rejection, and exclusion; and higher levels of violence against transgender people.<sup>2</sup>

### Race/ethnicity

During 2017, eight out of 10 (83%) people newly diagnosed with HIV were people of color, yet people of color make up approximately 55% of Milwaukee’s population (Figure 10). This health disparity is not due to innate biologic factors—one’s race or ethnicity alone does not make one more or less susceptible to HIV. Rather, other determinants of health such as poverty, unequal access to health care, lack of education, stigma, homelessness, and racism can disproportionately affect people of color and can put individuals at greater risk for acquiring HIV.<sup>3</sup>

**Figure 10: Percentage of new HIV diagnoses among White people and people of color, Milwaukee, 1982-2017**



The number and percent of new diagnoses in each racial and ethnic group are shown in Table 1.

**Table 1: Number and percentage of new HIV diagnoses by gender and race/ethnicity, Milwaukee, 2017**

	Black	White	Hispanic	Other Races	Total
<b>Male</b>	62 (63%)	17 (17%)	16 (16%)	3 (3%)	<b>98</b>
<b>Female</b>	13 (68%)	3 (16%)	2 (11%)	1 (5%)	<b>19</b>
<b>Transgender</b>	-	-	1 (100%)	-	<b>1</b>
<b>TOTAL</b>	<b>75 (64%)</b>	<b>20 (17%)</b>	<b>19 (16%)</b>	<b>4 (3%)</b>	<b>118</b>

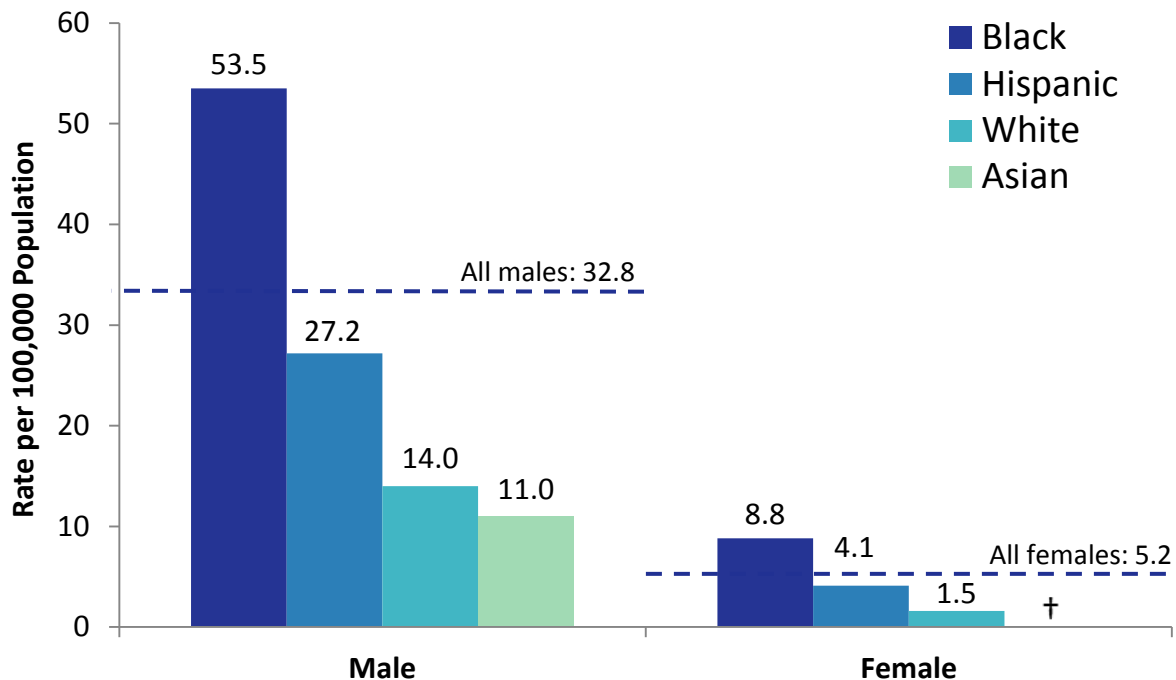
<sup>2</sup> Centers for Disease Control and Prevention. HIV Among Transgender People. <https://www.cdc.gov/hiv/group/gender/transgender/>. Published April 2017.

<sup>3</sup> Centers for Disease Control and Prevention. Disparities in HIV/AIDS, Viral Hepatitis, STDs, and TB. *Defining Health Disparities*. <http://www.cdc.gov/nchstp/healthdisparities/>. Published March 2014. Accessed April 2015.

## Race/ethnicity and sex

For all racial/ethnic groups, the HIV diagnosis rate is higher in Milwaukee than in the state. The HIV diagnosis rate further highlights the disproportionate impact of HIV on people of color. During 2013-2017 (years have been combined due to the small numbers for some racial/ethnic groups), the average annual HIV diagnosis rate for males was fourfold higher among Black people and twofold higher among Hispanic people (Figure 11). For females, the HIV diagnosis rate was sixfold higher among Black people and threefold higher among Hispanic people compared to White people. Rates for American Indian/Alaska Native people, Asian females, and multi-racial people are unreliable due to the small numbers in these categories. A comparison to White people is presented because this is the population group with the lowest stable rate for males and females.

**Figure 11: HIV diagnosis rate by sex and race/ethnicity, Milwaukee, 2013-2017**



†Rates based on counts less than five have been suppressed.  
Rates for American Indians and persons reporting multiple races not shown due to small counts for both sexes.

Annual HIV diagnosis rates for the larger racial/ethnic groups are shown in Table 2. The HIV diagnosis rate declined from 2008-2017 among Black females. There were no statistically significant changes among the other groups.



**Table 2: HIV diagnosis rate per 100,000 by sex and race/ethnicity, Milwaukee, 2008-2017**

Year of Diagnosis	Black Male	White Male	Hispanic Male	Black Female	White Female	Hispanic Female
2008	48.6	18.7	27.0	14.8	†	†
2009	51.0	20.8	18.3‡	19.9	†	†
2010	65.8	21.8	14.7‡	12.6	4.3‡	†
2011	57.7	10.1‡	22.3	12.7	†	9.8‡
2012	43.7	13.9	28.5	10.9	†	†
2013	47.8	18.6	28.2	10.2	†	†
2014	63.4	12.1	32.7	6.3‡	†	9.4‡
2015	55.4	16.8	21.2	6.3‡	†	†
2016	59.7	5.7‡	20.8	9.6	†	†
2017	58.9	16.2	27.2	10.3	†	†

†Rates based on counts less than 5 have been suppressed.

‡Rates are statistically unreliable due to counts less than 12.

### Transmission category based on reported risk and gender

Transmission categories for HIV include male-male sexual contact, both male-male sexual contact and injection drug use, heterosexual contact, sexual contact, injection drug use, and perinatal exposure (see Technical Notes for transmission category definitions). The transmission category for people diagnosed with HIV in Milwaukee during 2017 is shown in Table 3.

**Table 3: Number and percentage of new HIV diagnoses by gender and transmission category based on reported risk, Milwaukee, 2017**

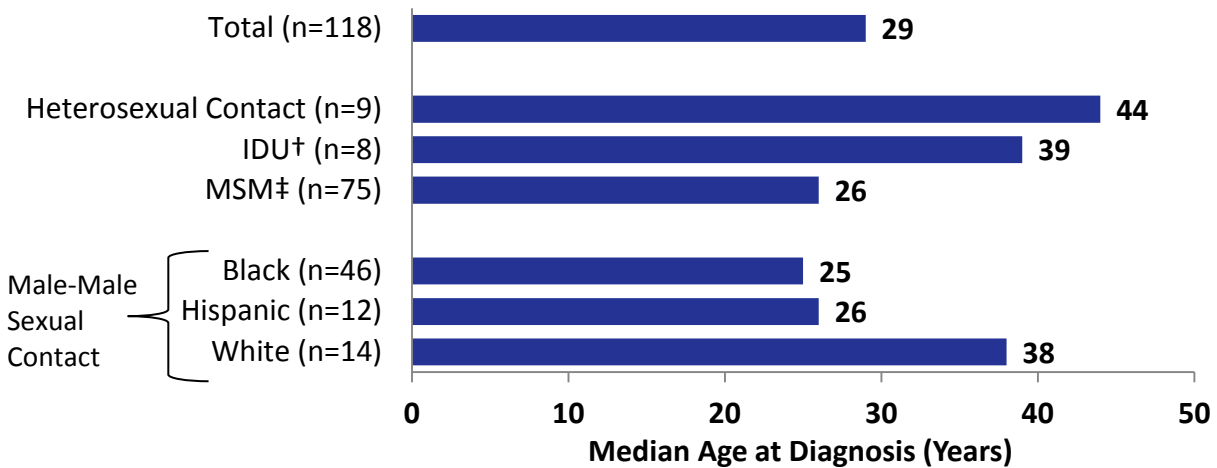
	MSM <sup>†</sup>	Injection Drug Use	Heterosexual Contact	Sexual Contact	Unknown	Total
Male	75 (77%)	5 (5%)	2 (2%)		16 (16%)	98
Female	-	3 (16%)	7 (37%)		9 (47%)	19
Transgender	-	-	-	1	-	1
<b>TOTAL</b>	<b>75 (64%)</b>	<b>8 (7%)</b>	<b>9 (5%)</b>	<b>1 (&lt;1%)</b>	<b>25 (8%)</b>	<b>118</b>

### Transmission category based on reported risk and age

The median age at HIV diagnosis during 2017 was 29 years, with variation by transmission category and within transmission category (Figure 12). For men whose diagnoses were attributed to male-male sexual contact, the median age at diagnosis was 26 years; however, Black and Hispanic men tended to be younger (median age 25 and 26 years, respectively) and White men tended to be older (median age 38 years) at the time of diagnosis. The median age at diagnosis among those with male-male sexual contact reflects in part the median age of the general male population living in Milwaukee. However, differences in HIV testing patterns may also explain the differing median ages at diagnosis. The median age at diagnosis among individuals with diagnoses attributed to injection drug alone or heterosexual contact was 44 and

39 years, respectively, although these numbers should be interpreted with caution due to the small number of individuals.

**Figure 12: Median age at HIV diagnosis by transmission category based on reported risk, and among men with diagnoses attributed to male-male sexual contact by race/ethnicity, Milwaukee, 2017**



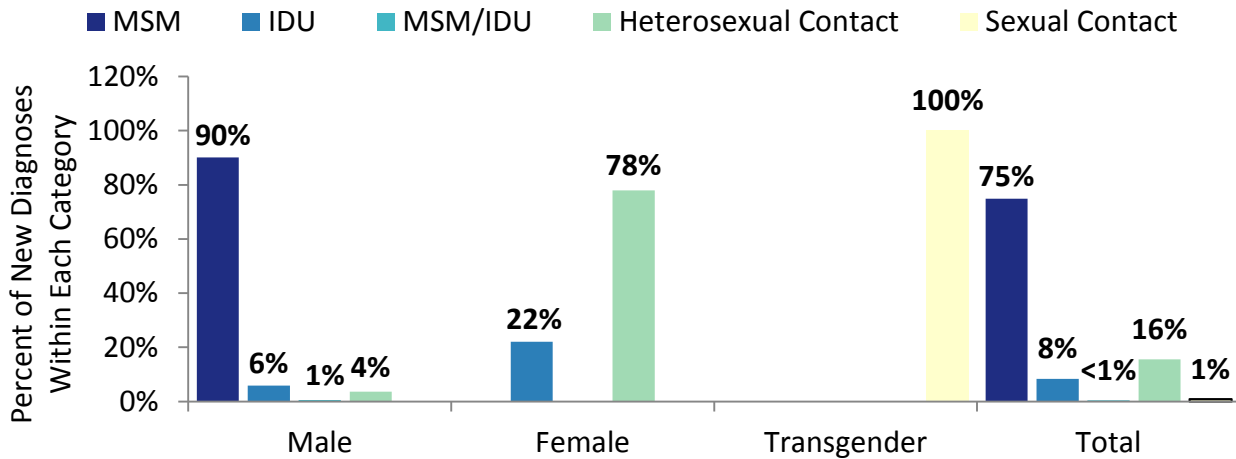
†IDU=injection drug use; ‡MSM=male-male sexual contact

### Estimated transmission category

In order to include all individuals in transmission category-based analyses, a statistical method called imputation is used to estimate the most likely transmission categories for individuals with missing information (see Technical Notes). After adjusting to account for those with unknown transmission category, 75% of new diagnoses during 2017 were attributed to male-male sexual contact, 16% to heterosexual contact, 8% to injection drug use (Figure 13).

Among males, after adjusting to account for those with unknown transmission category, 90% of diagnoses were attributed to male-male sexual contact, 1% was attributed to both male-male sexual contact and injection drug use, 4% were attributed to heterosexual contact, and 6% were attributed to injection drug use (Figure 13). Among females, 78% of diagnoses were attributed to heterosexual contact and 22% to injection drug use.

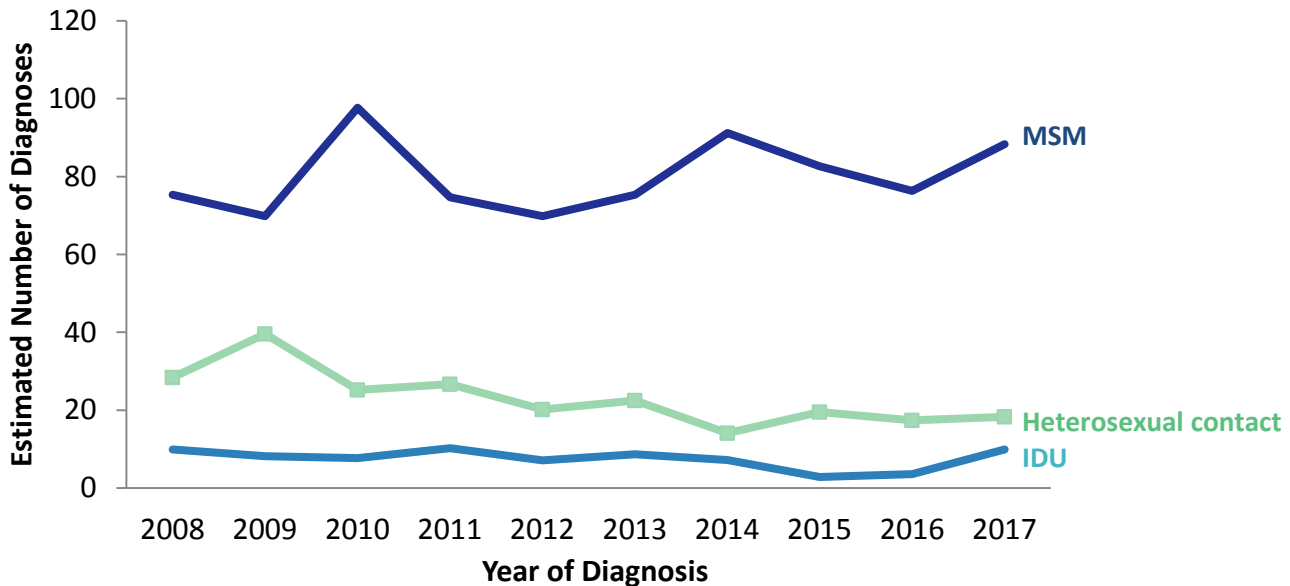
**Figure 13: Percentage of HIV diagnoses by sex and estimated transmission category†, Milwaukee, 2017**



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

From 2008 to 2017, the estimated number of diagnoses attributed to male-male sexual contact was stable and the number attributed to heterosexual contact declined (Figure 14). Prior to 2016, HIV diagnoses attributed to IDU were stable or declining, but an increasing trend has been observed since 2016.

**Figure 14: HIV diagnoses by estimated transmission category†, Milwaukee, 2008-2017**



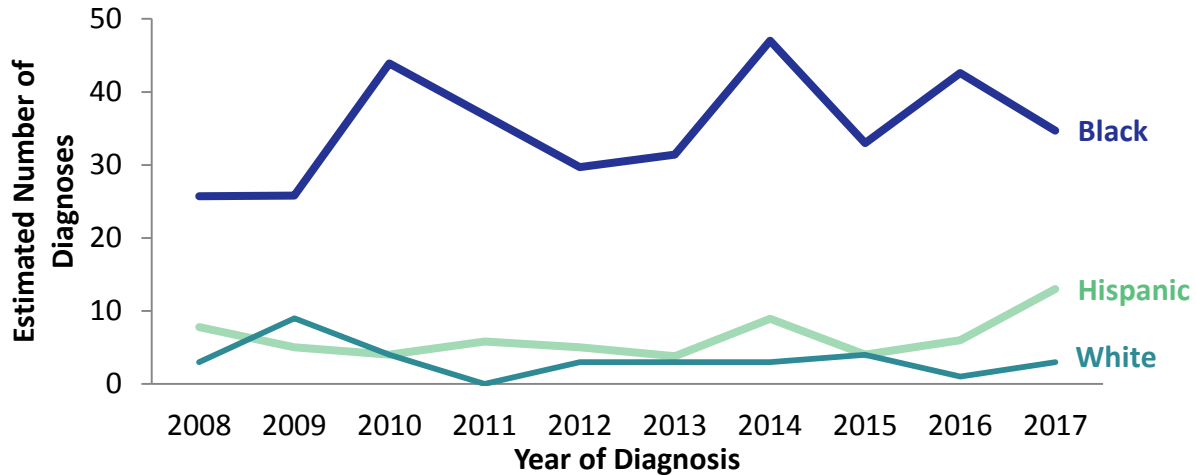
† Data have been statistically adjusted to account for those with unknown transmission category.

### Young men by race/ethnicity

Among the 54 young men (ages 13-29) diagnosed with HIV during 2017 whose HIV was attributed to male-male sexual contact, 65% were Black, 24% were Hispanic, 6% were White, and 6% were other races. The number of new diagnoses attributed to male-male sexual contact

among young men of all racial and ethnic groups fluctuated over the last decade such that there was no defined trend (Figure 15).

**Figure 15: HIV diagnoses attributed to male-male sexual contact<sup>†</sup>, ages 13-29, by race/ethnicity, Milwaukee, 2008-2017**



<sup>†</sup> Data have been statistically adjusted to account for those with unknown transmission category.

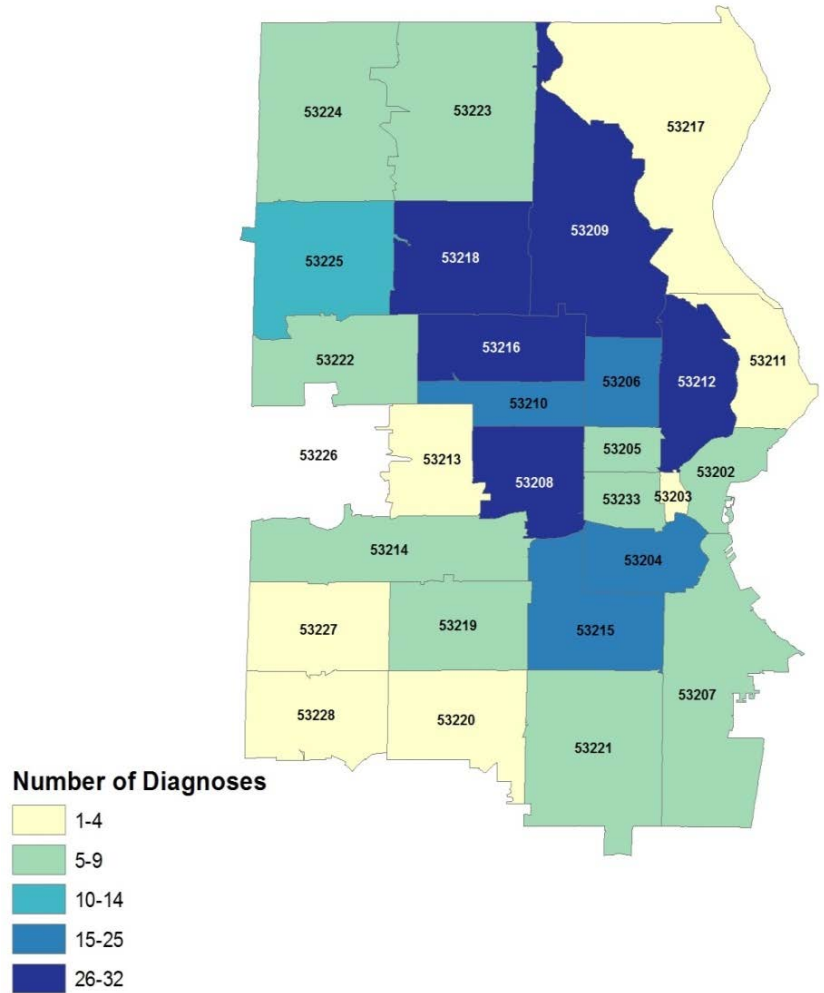
### Zip code of residence

During 2017, new HIV diagnoses were made among residents from 23 Milwaukee zip codes. Zip codes with the largest numbers of new diagnoses were 53208 (13), 53215 (12), and 53209, 53212, and 53216 (10 each). All other zip codes had fewer than 10 new diagnoses each.

During 2015-2016, new HIV diagnoses were made among residents from 27 Milwaukee zip codes. Zip codes with the largest numbers of new diagnoses were 53209 (32), 53208 and 53216 (27 each), 53212 and 53218 (26 each), and 53210 (25). All other zip codes had fewer than 25 new diagnoses each (Table 4, Figure 16).

**Table 4: Number and percent of new HIV diagnoses by zip code of residence, Milwaukee, 2015-2017**

Zip Code	Number	Percent
53209	32	9.7
53208	27	8.2
53216	27	8.2
53212	26	7.9
53218	26	7.9
53210	25	7.6
53215	24	7.3
53206	23	7.0
53204	21	6.4
53225	14	4.2
53207	9	2.7
53214	9	2.7
53233	9	2.7
53224	8	2.4
53205	7	2.1
53222	7	2.1
53223	7	2.1
53202	5	1.5
53219	5	1.5
53221	5	1.5
53211	4	1.2
53213	4	1.2
53227	2	0.6
53203	1	0.3
53217	1	0.3
53220	1	0.3
53228	1	0.3
<b>TOTAL</b>	<b>330</b>	<b>100%</b>



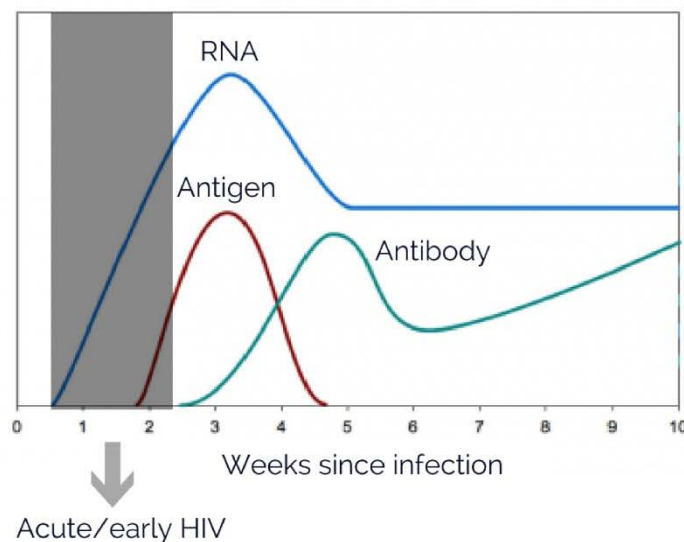
**Figure 16: HIV diagnoses by zip code of residence, Milwaukee, 2015-2017**

## HIV Stage at Diagnosis

### Acute and recent HIV

For this report, acute HIV is when an individual is 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 RNA or p24 antigen (Figure 17). Individuals with acute HIV may be more likely to transmit HIV to others due to the high amount of virus in the body and will benefit in the long term from rapid initiation of therapy. Therefore, it is critical to rapidly link people with acute HIV to medical care and to Partner Services staff at local health departments who notify and test individuals who may have been exposed to HIV. Recent HIV, for this report, 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 (see Technical Notes).

**Figure 17: Window of laboratory-confirmed acute HIV infection**



During 2017, there were an estimated 24 individuals diagnosed with acute or recent HIV in Milwaukee. Of the 24:

- Eight people met the acute HIV definition based on the laboratory testing algorithm or the presence of acute symptoms.
- Sixteen additional people reported a negative HIV test result in the six months prior to their positive test result, indicating they acquired HIV within the prior six months. Self-reported negative HIV tests are not verified, and therefore some individuals may be misclassified as having recently acquired HIV.

Of the eight diagnoses of acute HIV, three were from an inpatient hospitalization or an emergency room, two were from an outpatient clinic, two were from the city health department, and one was from a counseling, testing, and referral site.

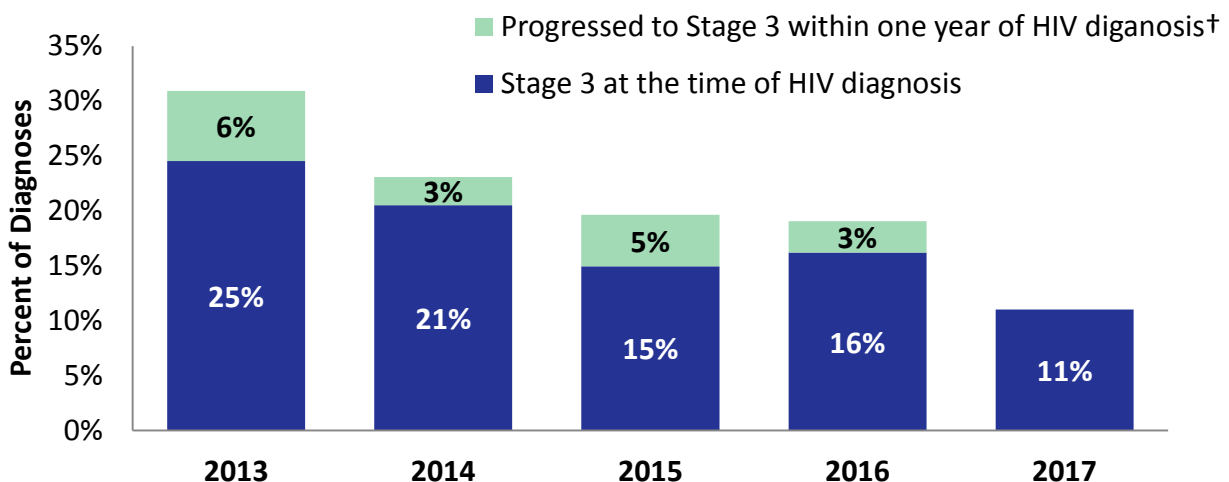
## Late diagnosis

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 who have progressed to Stage 3 by the time they are first diagnosed with HIV. Stage 3 HIV typically occurs eight to ten years after acquiring HIV in the absence of treatment and is based on very low CD4 count and/or a Stage 3-defining opportunistic infection. Early diagnosis is important both for optimal health outcomes for the person living with HIV and for reducing the risk of further HIV transmission.

The percentage of people diagnosed with HIV in Milwaukee who had already progressed to Stage 3 by the time they were first diagnosed with HIV declined from 25% in 2013 to 11% in 2017 (Figure 18). This may reflect, in part, a 2014 change to the Stage 3 surveillance definition, in which individuals with a Stage 3-defining CD4 count (<200 cells/mL) are no longer designated as having progressed to Stage 3 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.

The percentage of individuals progressing to Stage 3 within one year of HIV diagnosis (including being first diagnosed during Stage 3) declined from 31% in 2013 to 19% in 2016.

**Figure 18: Percentage of people first diagnosed with HIV during Stage 3 or who progressed to Stage 3 within one year of HIV diagnosis, by year of HIV diagnosis, Milwaukee, 2013-2017**

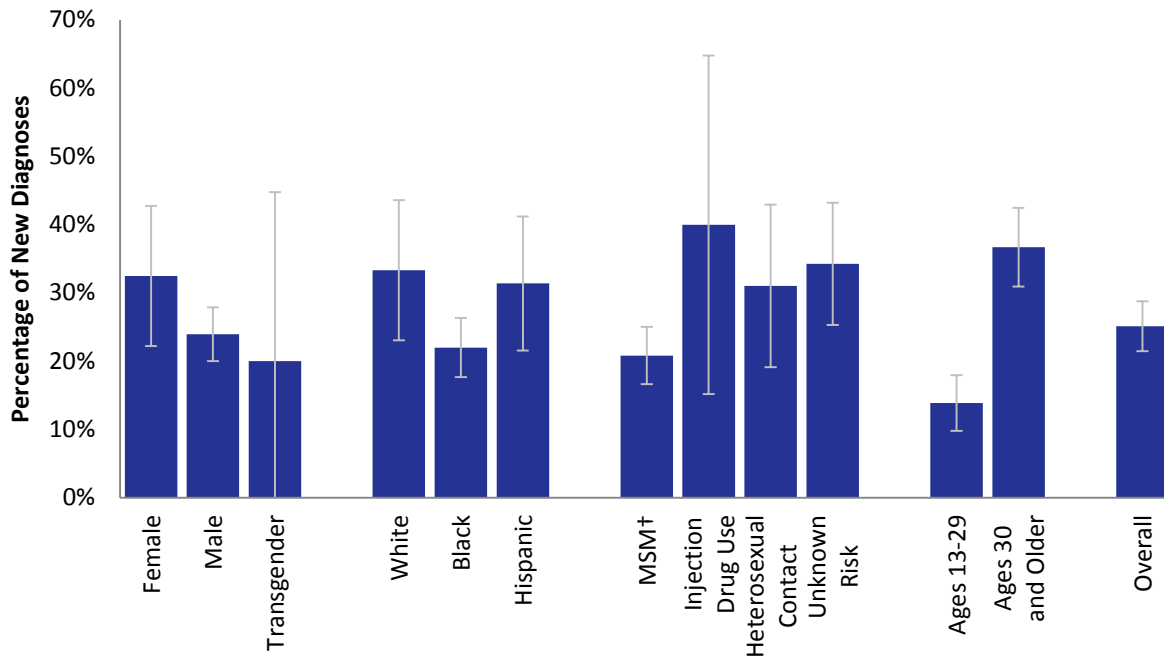


†Those diagnosed with HIV during 2017 have not had one full year to evaluate progression to Stage 3 and therefore this category is excluded.

The proportion of individuals diagnosed in Milwaukee during 2012-2016 who had already progressed to Stage 3 by the time they were first diagnosed, or who progressed to Stage 3 within one year is shown in Figure 19 by demographic group. A higher percentage of persons ages 30 and older had progressed to Stage 3 within a year of HIV diagnosis compared to persons ages 13-

29. A higher percentage of White and Hispanic people had progressed to Stage 3 within a year of HIV diagnosis compared to Black people.

**Figure 19: Percentage of people first diagnosed with HIV during Stage 3 or who progressed to Stage 3 within one year of HIV diagnosis, by demographic group, Milwaukee, 2013-2017**



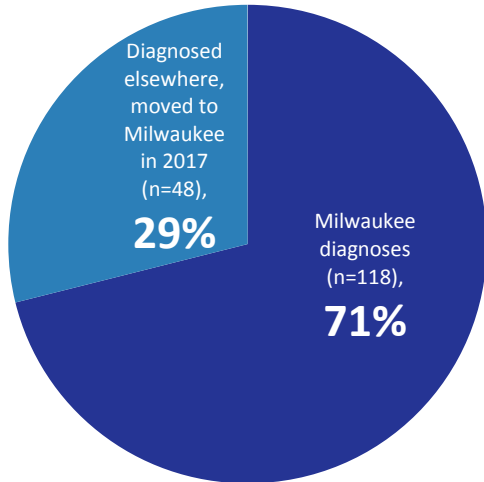
†MSM includes MSM/PWID.

## In-migration

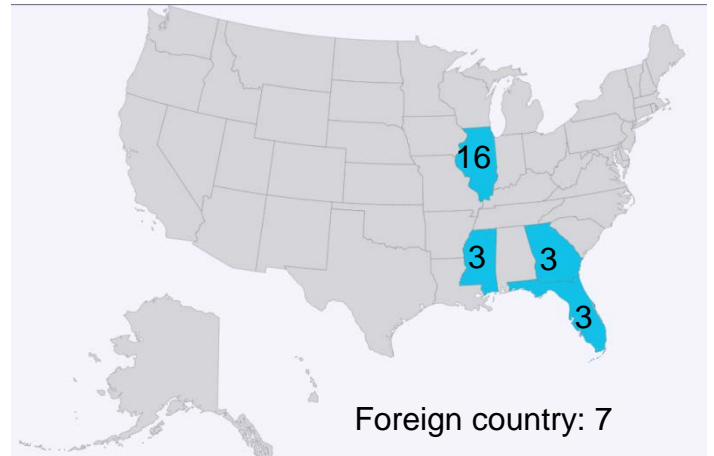
Each year individuals who were previously diagnosed with HIV in another state or country move to Milwaukee and are reported to the HIV Surveillance Program. During 2017, there were 48 individuals newly reported with HIV in Milwaukee who were first diagnosed outside of Milwaukee (Figure 20). People previously diagnosed with HIV who moved to Milwaukee most commonly moved from Illinois (16), a foreign country (7), Georgia (3), Florida (3), and Mississippi (3)—all other states had fewer than three people (Figure 21).



**Figure 20: Percent of people diagnosed with HIV in another state and moved to Milwaukee compared to percent of people newly diagnosed with HIV, Milwaukee, 2017**



**Figure 21: Number of people living with HIV in Milwaukee who received their initial HIV diagnosis in another state, by top five places of initial HIV diagnosis, Milwaukee, 2017**



## Prevalence

The number of people living with HIV at a given point in time is termed “prevalence.” As described in Figure 1, prevalence includes people newly diagnosed with HIV in Milwaukee, people already living with HIV in Milwaukee, and people living with HIV that move to Milwaukee. In 2017, there were 2,991 people living with diagnosed HIV in Milwaukee.

### *Unaware of HIV Status*

Due to increased testing efforts, the number of people living with HIV who are unaware of their status is decreasing. The most recent CDC estimates<sup>4</sup> (based on 2014 data) indicate that nationally, 15% of people (about 1 in 6) living with HIV are unaware of their status—and this percentage varies considerably by demographic group. People in the younger age groups are estimated to be less aware of their positive HIV status; almost half (44%) of people ages 13–24 with HIV are estimated to be unaware of their status.

In 2017, CDC provided state-level estimates of the percentage of people living with HIV who were unaware of their status.<sup>5</sup> The estimate for Wisconsin, based on data from 2008–2014, is 16.7% (1 in 6), higher than the national estimate of 15%. Thus, there are likely nearly 3,600 people living with HIV in Milwaukee.

These findings have implications for planning HIV testing services. Once people are aware they are living with HIV, they are at lower risk of transmitting HIV for two reasons: they are more likely to reduce their risk behaviors and they are more likely to receive medical care and have access to medication that reduces their viral load—the amount of virus circulating in the body. These estimates of the number unaware of their HIV should guide priority-setting and population-targeting for testing services.

## Geography

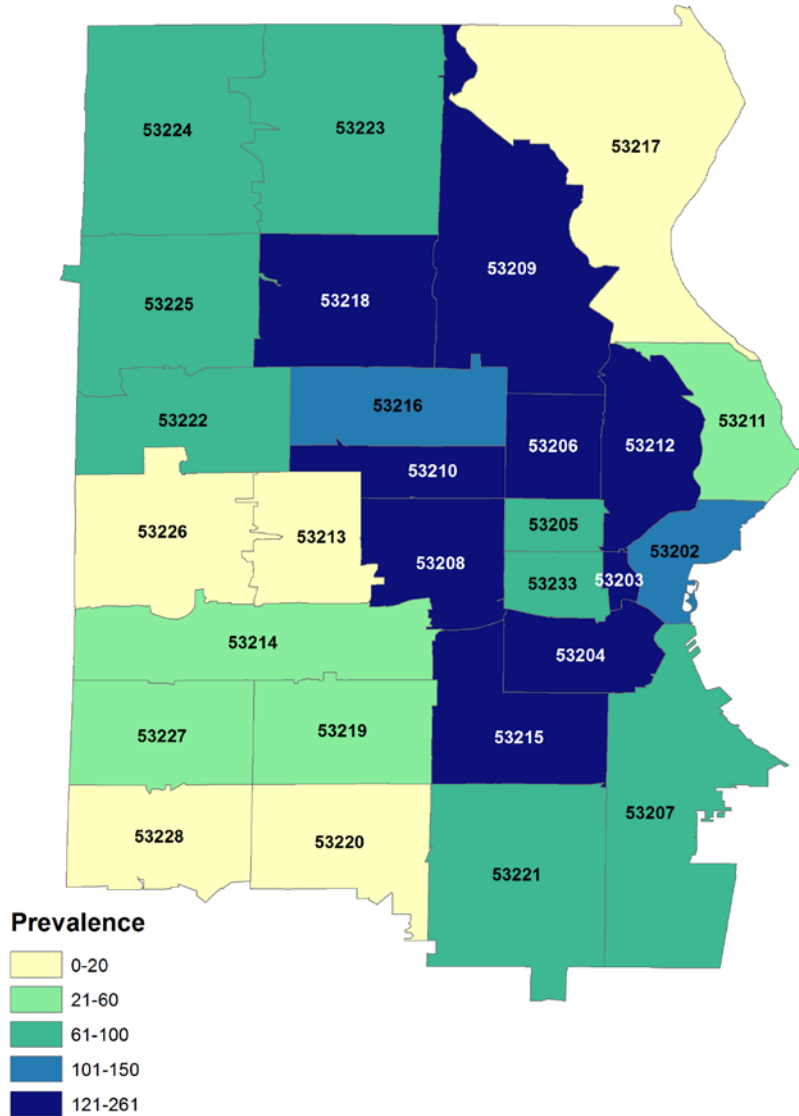
HIV prevalence by last known zip code of residence is shown in Figure 22. Zip codes with the highest reported HIV prevalence were 53208 (261), 53204 (256), 53215 (224), 53203 (215), and 53212 (194).

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<sup>4</sup> Centers for Disease Control and Prevention. Monitoring selected national HIV prevention and care objectives by using HIV surveillance data—United States and 6 dependent areas, 2014. *HIV Surveillance Supplemental Report* 2016;2(No. 4). <https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-21-4.pdf>. Published July 2016. Accessed February 2017.

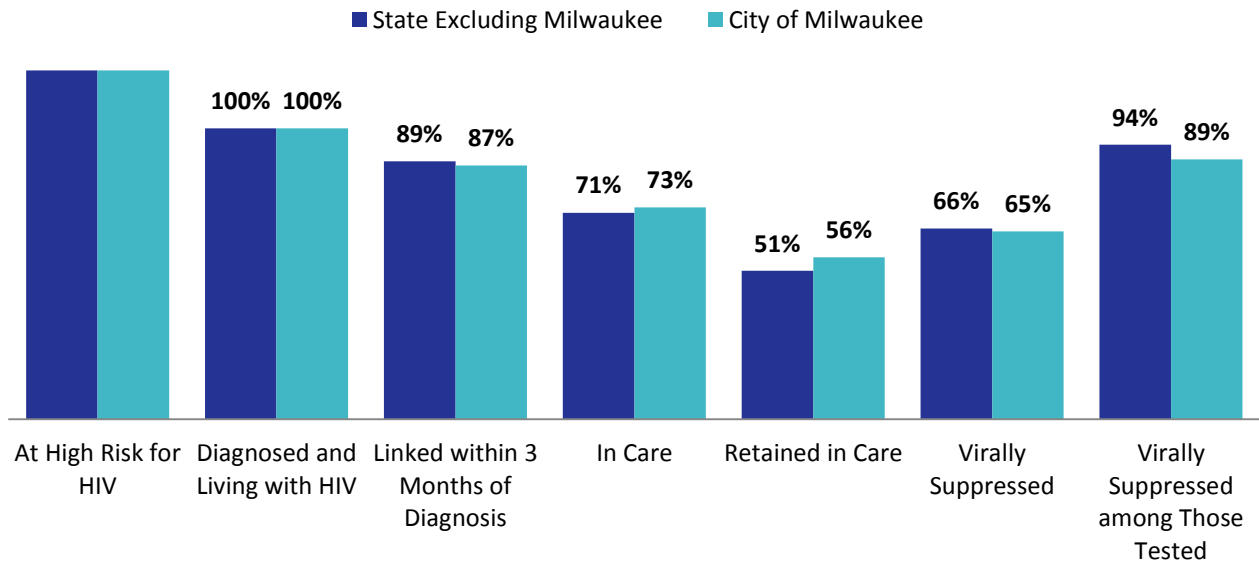
<sup>5</sup> Johnson AS, Song R, Hall I. State-level estimates of HIV incidence, prevalence, and undiagnosed infections. February 2017. Poster presented at the annual Conference on Retrovirus Infection, Seattle, WA.

**Figure 22: Number of people living with HIV (prevalence) by zip code, Milwaukee, 2017**



## HIV Care Continuum

The HIV care continuum is used at the state, regional, and local levels to measure and monitor HIV engagement and health outcomes across the continuum. The care continuum in Figure 23 depicts timely linkage among individuals diagnosed with HIV in Milwaukee during 2017 and care patterns during 2017 among people living with HIV at the end of 2016 and compares Milwaukee with the state.

**Figure 23: HIV care continuum,<sup>†</sup> Milwaukee compared to Wisconsin, 2017**

<sup>†</sup>Reflects laboratory data received through March 15, 2018

**At High Risk for HIV—the “bar before the bars”:** Factors that put people at higher risk for HIV include male-to-male sex without a condom or pre-exposure prophylaxis (PrEP), sharing injection drug-use equipment, and heterosexual sexual contact with a person living with HIV or at risk of acquiring HIV. The size of this population is not known. These risk behaviors occur in the context of social determinants of health, such as poverty, unequal access to health care, lack of education, stigma, homelessness, and racism.

## Based on Surveillance Data

**Diagnosed and Living with HIV:** CDC estimates that 16.7% of people living with HIV in Wisconsin are unaware of their status. The second bar, however, shows only those who are diagnosed. All individuals reported with HIV in Milwaukee by the end of 2016 who were still alive and living in Milwaukee by the end of 2017 (n=2,783) are represented by the second teal bar. Statewide, excluding Milwaukee, 3,807 people were reported by the end of 2016 who were still alive and living in Wisconsin by the end of 2017.

**Linked within Three Months of Diagnosis:** 87% of individuals newly diagnosed with HIV in Milwaukee during 2017 were linked to care within three months of HIV diagnosis; 89% statewide excluding Milwaukee. Using the definition of timely linkage described in the most recent National HIV/AIDS Strategy,<sup>6</sup> 73% of newly diagnosed individuals were linked to care within one month in Milwaukee; 76% of newly diagnosed individuals were linked to care within one month statewide excluding Milwaukee.

<sup>6</sup> Office of National AIDS Policy. National HIV/AIDS Strategy for the United States: Updated to 2020. (2015). Available at <https://www.whitehouse.gov/administration/eop/onap/nhas>.

**In Care:** 73% of individuals diagnosed and living with HIV in Milwaukee had at least one medical visit, using laboratory data as a proxy for medical care, during 2017 71% statewide excluding Milwaukee.

**Retained in Care:** 56% of individuals diagnosed and living with HIV in Milwaukee were retained in care, based on laboratory data as a proxy for medical care; 51% statewide excluding Milwaukee. Retention was defined as two or more medical visits at least three months apart during 2017. This definition may underestimate retention in care, as individuals who are medically stable or who are uninsured may receive care only once per year. Milwaukee has higher retention in care than statewide excluding Milwaukee.

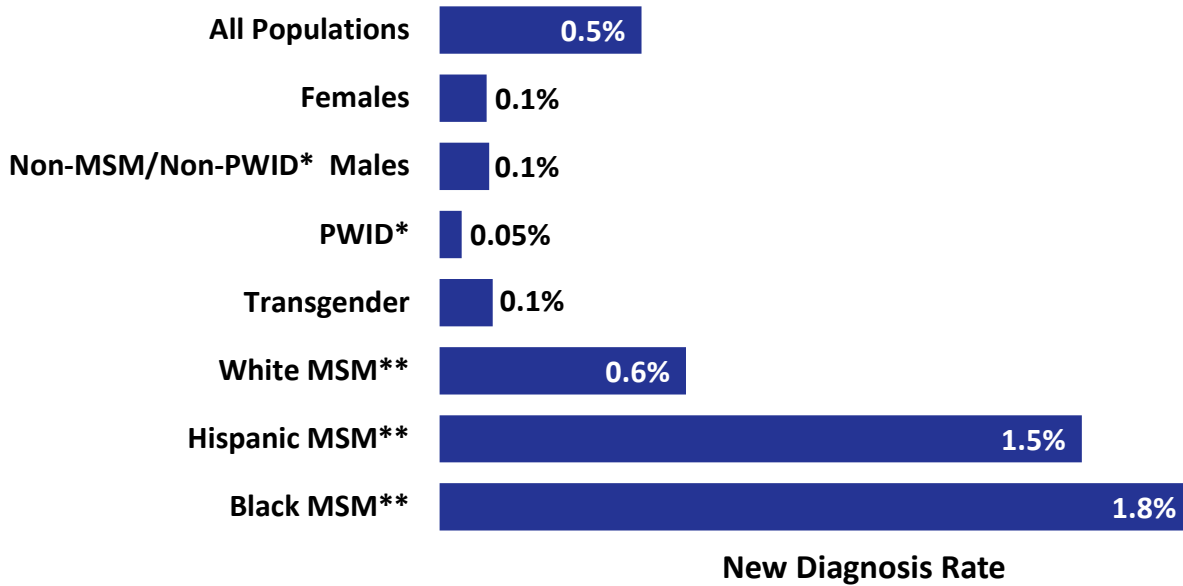
**Virally Suppressed:** 65% of individuals living with HIV in Milwaukee were virally suppressed at their last viral load test during 2017 66% statewide excluding Milwaukee. Viral loads <200 copies/mL were considered suppressed. Individuals whose last viral load test was prior to 2017 or who did not have a viral load test were considered to have unsuppressed viral loads.

**Virally Suppressed Among Those Tested:** 89% of individuals living with HIV in Milwaukee who had a viral load test during 2017 were suppressed at their last measurement; 94% statewide excluding Milwaukee. This suggests that most individuals receiving some medical care are achieving viral suppression. Milwaukee has lower viral suppression among those tested than statewide excluding Milwaukee.

## HIV Testing

HIV testing occurs in a variety of settings, including publicly funded test sites and private medical clinics. This section provides information about new diagnoses identified at the counseling, testing, and referral (CTR) sites in the city of Milwaukee funded by the Wisconsin Division of Public Health. These CTR sites include community-based organizations and the city health department. From 2013 to 2017, the new diagnosis rate—the number of new HIV diagnoses divided by the total number of HIV tests for each year—for the CTR sites in Milwaukee was 0.5% (Figure 24). The new diagnosis rate was higher among men who have sex with men (summarized here as MSM). The new diagnosis rate was the highest at 1.8% among Black MSM, followed by Hispanic MSM (1.5%).

**Figure 24: New HIV diagnosis rate at publicly funded counseling, testing, and referral sites in Milwaukee for various populations, 2013-2017**

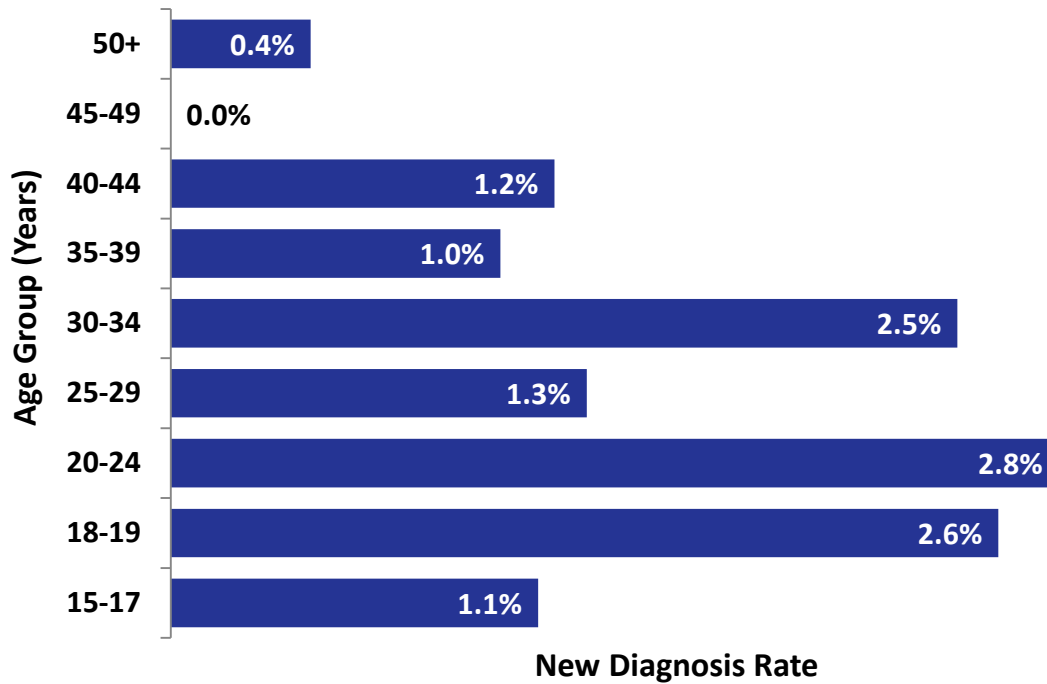


\* People who inject drugs (PWID)

\*\* Male-male sexual contact also includes diagnoses attributed to both male-male sexual contact and injection drug use.

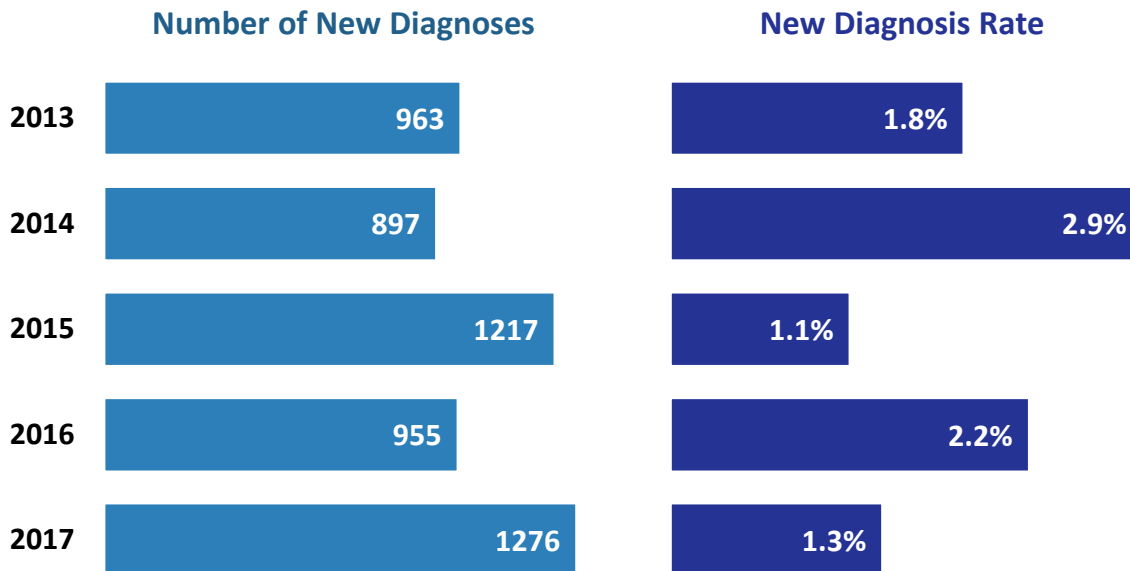
Among Black MSM, the new diagnosis rate at CTR sites was the highest (2.8%) in the 20- to 24-year age group, followed by the 18- to 19-year age group (2.6%) and the 30- to 34-year age group (2.5%), over the five-year period (Figure 25).

**Figure 25: New HIV diagnosis rate at publicly funded counseling, testing, and referral sites in Milwaukee for Black MSM, by age group, 2013-2017**



Among Black MSM, the number of HIV tests conducted by CTR sites in Milwaukee has fluctuated around a median of 963 tests per year during 2013-2017. New HIV diagnosis rates ranged 1.1%-2.9% during this time period with a median of 1.8% (Figure 26).

**Figure 26: Total tests and new HIV diagnosis rate at publicly funded counseling, testing, and referral sites in Milwaukee for Black MSM, 2013-2017**



From 2013-2017, 70% of the new HIV diagnoses from all the publicly funded CTR sites across Wisconsin were identified by the CTR sites in Milwaukee. Of those diagnosed at CTR sites in

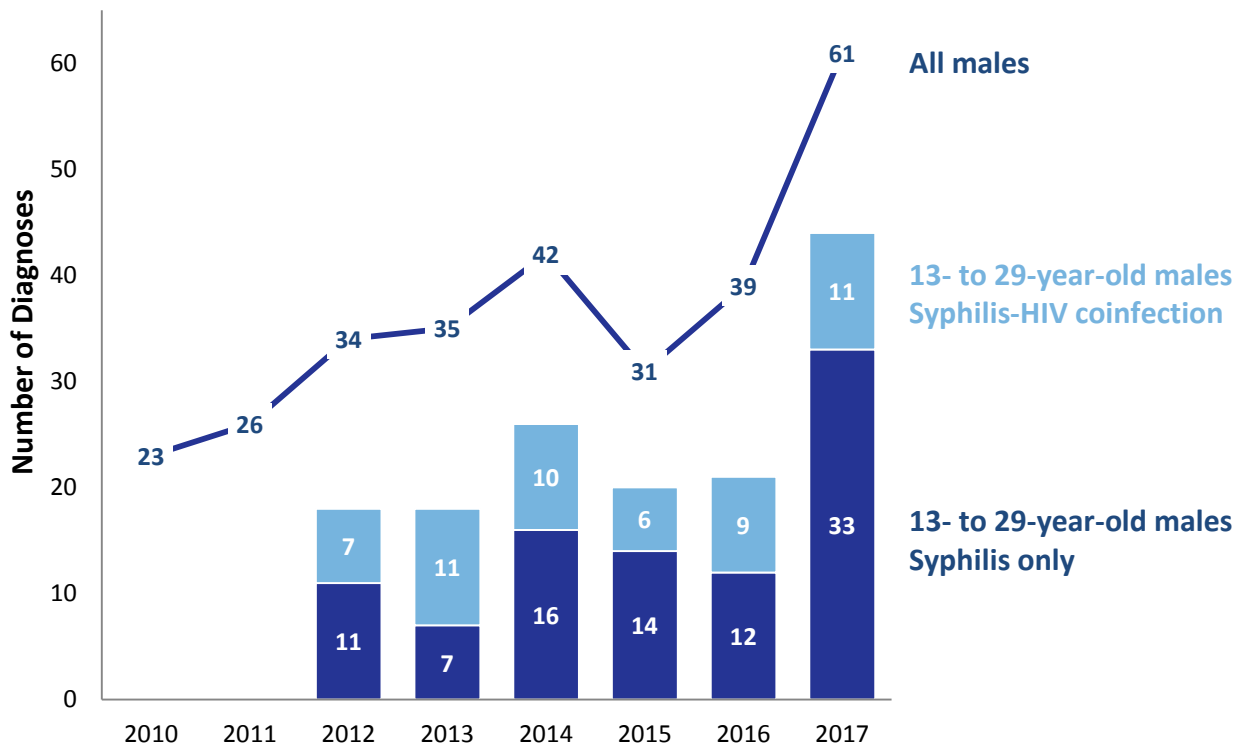
Milwaukee, about one out of three people were diagnosed at the Milwaukee Health Department and the remainder at other funded CTR sites in the city.

## Syphilis Diagnoses

Syphilis diagnoses can be an indicator of HIV risk within the community of gay, bisexual, and other men who have sex with men. Sores associated with syphilis can make it easier to transmit and acquire HIV. According to the CDC, gay, bisexual, and other men who have sex with men accounted for over 81% of all primary and secondary syphilis diagnoses in the U.S. during 2015 among males for whom sex of sex partner was known.<sup>7</sup> Males ages 20-29 have the highest syphilis diagnosis rates nationally.<sup>7</sup>

Among males in Milwaukee, the total number of primary and secondary syphilis diagnoses increased between 2010 and 2017, with a median number of 34.5 diagnoses per year (Figure 27). Between 2013 and 2017, 42% of men aged 13-29 diagnosed with syphilis were living with HIV (Figure 27).

**Figure 27: Primary and secondary syphilis diagnoses and HIV co-infection among men—Milwaukee, 2010-2017**



<sup>7</sup> Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2015*. Atlanta: U.S. Department of Health and Human Services; 2016. <https://www.cdc.gov/std/stats15/std-surveillance-2015-print.pdf>



## Technical Notes

### New in 2017

**Gender-based analyses:** To be consistent with the Council of State and Territorial Epidemiologists' (CSTE) position statement on Transgender HIV Surveillance<sup>8</sup>, and to provide stakeholders, partners, and community members with more information on how HIV affects transgender persons, the report no longer uses sex assigned at birth, but rather gender identity. Additional details on the calculation of transgender gender identity are described below.

### Background

This report is compiled by the Wisconsin AIDS/HIV Program and is based primarily on HIV surveillance data collected by the Wisconsin DPH. In Wisconsin, state statutes require health care providers and laboratories to report people known or suspected to have HIV to DPH. Data in this report are compiled from report forms completed by health care providers. Risk information is self-reported by patients. Data reported here are based on the information available on the date the data were frozen for analysis. Therefore, all data are provisional and subject to change as additional information becomes available.

Completeness of reporting for HIV in Wisconsin is estimated to be over 99% but may vary by geographic region, transmission category, and demographic group. Thus, at any time, reports of HIV represent only part of the total number of people diagnosed with HIV. Because some people are living with *undiagnosed* HIV, reported HIV underestimates total HIV morbidity.

### 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 Wisconsin at the time of diagnosis.
- Wisconsin is the first state of verifiable, name-based, HIV report. Also included are individuals who report being first diagnosed with HIV in another country, but for whom evidence is lacking to support a foreign residence at diagnosis. These practices conform to CDC's guidelines for residency assignment.

### Prevalence

People living with HIV are included in the prevalence calculation for a given year if they meet all of 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 (i.e., no documentation of death has been received and the person did not match any records in local or national death data).
- The last known address available for the person is a Wisconsin address.

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<sup>8</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 February 28, 2018.

Because of delays in reporting deaths, 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 Wisconsin are found to be deceased or living out of state.

### **Estimated Prevalence of HIV**

The estimate prevalence is dependent upon the most recent estimate of the proportion of individuals unaware of their HIV. The calculation consists of:

- Number known to be living with HIV
- Proportion unaware

The estimated prevalence is calculated as:

$$\frac{\text{Number of cases living with HIV}}{\text{Proportion unaware}}$$

### **HIV stage at diagnosis**

In this report, HIV refers to all people with laboratory-confirmed HIV. This includes both HIV and Stage 3 HIV (AIDS). People classified with Stage 3 HIV include only those that meet the CDC's Stage 3 HIV surveillance definition.

### **Age**

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

### **Gender**

Gender is calculated based on information in eHARS. 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. In 2017, transgender gender identity was not further verified; therefore, some individuals may be mistakenly counted as transgender in this report if sex or gender was incorrectly reported on any document or if data entry errors occurred.

### **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. People 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.
- Heterosexual contact includes persons who have ever had heterosexual contact with a person known to have, or to be at high risk for, HIV (e.g., someone who injects drugs). The

heterosexual contact category excludes men who have ever had sexual contact with both men and women.

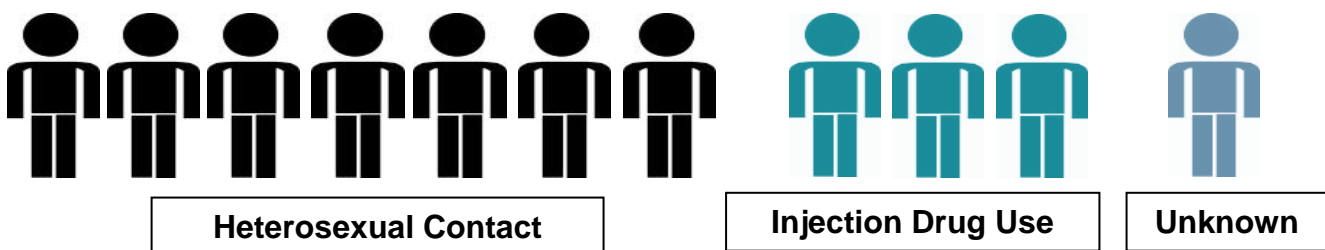
- Injection drug use includes persons who have ever reported injecting drugs.
- Unknown includes people without a risk factor listed in the hierarchy of transmission categories. People may have an unknown transmission category because they did not identify risk behaviors, identified risk behaviors not 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 people exposed to HIV through sexual contact.

### Imputed transmission category

Because some people diagnosed with HIV are reported in Wisconsin with unknown transmission category, multiple imputation is used to assign possible transmission categories. 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.

#### Example

Assume there were 11 women ages 45-64 diagnosed with HIV, and seven of them had diagnoses attributed to heterosexual contact (70%), three of them had diagnoses attributed to injection drug use (30%), and one had unknown transmission category (see figure below). The 10 known transmission categories will be applied to the one person with unknown transmission category. In this case the person with unknown transmission category would be assigned 70% heterosexual contact and 30% injection drug use.



It is important to note that counts by imputed transmission category are estimates, not actual counts. Imputed transmission categories are subject to change as more information becomes available. This method conforms to CDC's method of addressing people with unknown transmission category.

### Estimated Prevalence of HIV by Demographic Group

The estimated HIV prevalence is dependent upon the most recent estimate of the proportion of individuals unaware of their HIV, the age group of interest, the estimate of the number of men who have sexual contact with other men, and HIV prevalence. Since several of these measures

change over time (e.g., estimated proportion unaware, HIV prevalence), estimates may not be comparable from year to year. The calculation consists of:

- Number of people living with HIV in Wisconsin at year end, using imputed estimates for transmission categories.
- Estimated number unaware, calculated as the number living with HIV/proportion unaware, using the more recent national estimate.
- Actual population size from the Wisconsin Interactive Statistics on Health (WISH, <https://www.dhs.wisconsin.gov/wish/index.htm>) or estimated population size by transmission category using available estimates.

The estimated prevalence for each demographic group is calculated as:

$$\frac{\text{Number of cases living with HIV} + \text{estimated number unaware}}{\text{Population size}}$$

### Rates

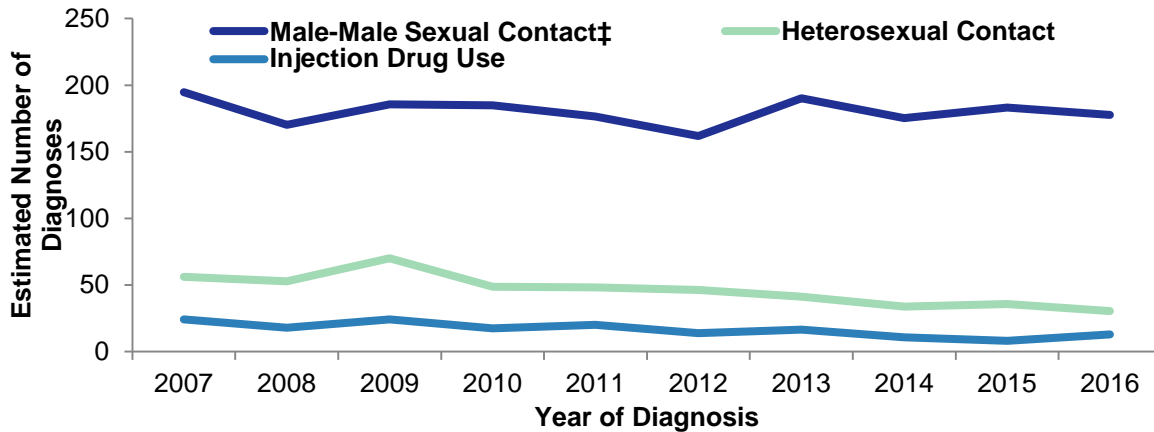
- In this report, rates are defined as number of people per 100,000 population, except where noted. Population denominators used to calculate rates are from the Wisconsin Interactive Statistics on Health website (<https://www.dhs.wisconsin.gov/wish/index.htm>).
- Rates published by the CDC for Wisconsin, Milwaukee, and Madison cannot be compared to those prepared by the Wisconsin Division of Public Health and local health departments because they use different data sources.

### Statistical significance

Statements about statistical significance are sometimes made when looking at a change over time or when comparing groups. Tests of statistical significance allow us to determine whether the observed change over time or difference between groups is most likely due to random fluctuation or whether it is likely to be a real difference. In this report, linear regression was used to assess trends over time and chi-squared analysis was used to assess differences between groups.

### Example

Looking at the figure below, it is difficult to tell whether the overall number of diagnoses for each transmission category changed over the last decade; therefore, a statistical test is used to help distinguish true trends from annual fluctuation. In this case, statistical tests (not shown) indicate that the number of diagnoses was stable among people with diagnoses attributed to male-male sexual contact, and declined for those with diagnoses attributed to heterosexual contact or injection drug use.



In this report, statements are made about trends only if the trends are statistically significant. Non-significant trends are described as stable or fluctuating. When comparing groups, differences are statistically significant if confidence intervals do not overlap. However, if confidence intervals do overlap, we cannot say whether or not the two groups are statistically different without doing additional statistical tests.

### Residency

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

### Death Data

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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