

# Wisconsin HIV Surveillance Annual Review

New diagnoses, prevalence, and deaths through December 31, 2017

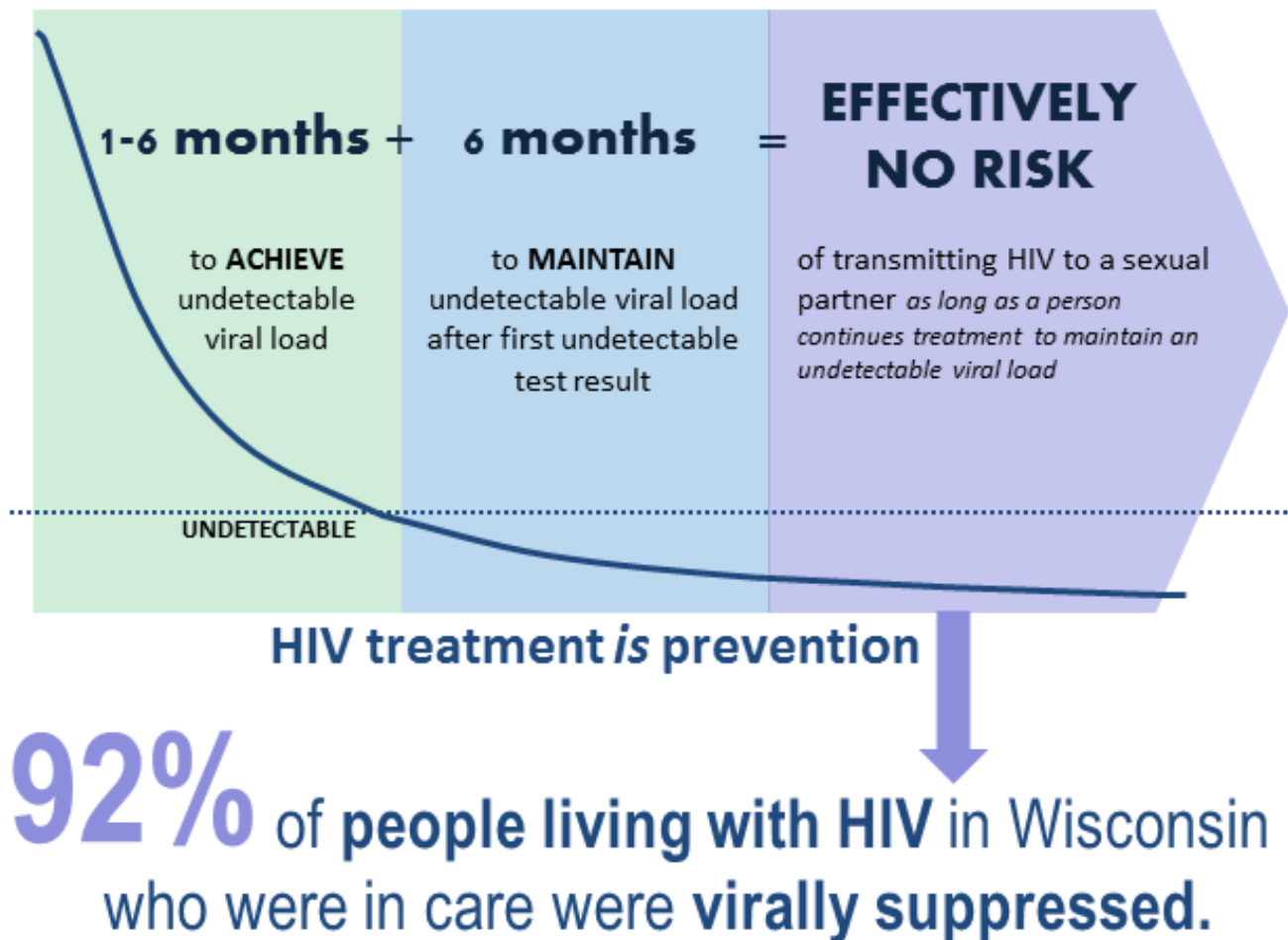


Figure modified from <https://www.niaid.nih.gov/news-events/10-things-know-about-hiv-suppression>



WISCONSIN DEPARTMENT  
of HEALTH SERVICES

Division of Public Health  
HIV Program  
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**ABBREVIATIONS**

CDC	Centers for Disease Control and Prevention
DHS	Department of Health Services
DPH	Division of Public Health
IDU	Injection drug use
MSM	Men who have sex with men
PLWH	People living with HIV
PWID	People who inject drugs
STI	Sexually transmitted infection

## Data Highlights

### New diagnoses in 2017

75% Attributed to male-male sexual contact

88% 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

7,123 People living with diagnosed HIV

72% Received some care

65% Are virally suppressed

1,200 Estimated people living with undiagnosed HIV

## EXECUTIVE SUMMARY

The annual Wisconsin HIV surveillance review presents data on people newly diagnosed with HIV during 2017; people living with HIV (PLWH) in Wisconsin as of December 31, 2017; and deaths among PLWH through 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 Wisconsin residents—those individuals for whom HIV might have been prevented or identified earlier within the state. When planning care and treatment services, the focus should be on PLWH irrespective of where they were first diagnosed.

## NEW DIAGNOSES

**Trend:** During 2017, 259 people were newly diagnosed with HIV in Wisconsin. Between 2008 and 2017, both the number and rate of new diagnoses declined. The number of new diagnoses over the last decade ranged from a low of 221 (2014) to a high of 282 (2009), with

an average of 242 new diagnoses per year. The HIV diagnosis rate in Wisconsin was the 8th lowest among the 50 states in 2016.

**Sex:** Five times more males than females were diagnosed with HIV (214 males and 42 females). Between 2008 and 2017, the HIV diagnosis rate increased among younger (ages 13-29) males and fluctuated among older (ages 30-59) males. The diagnosis rate fluctuated for younger females and declined among older females.



**Gender:** Since 1985, 56 transgender individuals have been diagnosed with HIV in Wisconsin. During 2008–2017, there were 40 new HIV diagnoses in transgender persons, of which 20 were Black, 12 were Hispanic, and 27 were under age 30 at the time of diagnosis.

**Racial/ethnic groups:** HIV disproportionately affects racial/ethnic minorities in Wisconsin. During 2017, 61% of new diagnoses were among racial/ethnic minorities, despite minorities making up just 17% of Wisconsin’s population. During 2013-2017, the HIV diagnosis rate for males was thirteenfold higher among Blacks, fivefold higher among Hispanics, and almost twofold higher among Asians and American Indians compared to Whites. For females, the HIV

diagnosis rate was twenty-onefold higher among Blacks and fivefold higher among Hispanics compared to Whites.



**Age:** The median age at HIV diagnosis was 31 years but varied considerably by transmission category. The median age at diagnosis was 28 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 35 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, including 3% attributed to both male-male sexual contact and injection drug use; 15% were attributed to heterosexual contact; and 9% were attributed to injection drug use. From 2008-2017, the number of HIV diagnoses attributed to male-male sexual contact was stable and the number attributed to heterosexual contact declined. Due to the larger number of diagnoses attributed to injection drug use during 2017 compared to 2016, there is no longer a statistical decline over the past 10 years.

**Geography:** During 2017, residents in 36 of Wisconsin's 72 counties were diagnosed with HIV. However, the distribution was uneven: Milwaukee County accounted for 51% of new diagnoses, Dane County for 10%, Kenosha and Racine counties for 4% each, and Outagamie and Winnebago for 3% each. The Department of Corrections accounted for 4%. All other counties each accounted for fewer than 3% of diagnoses.

**HIV stage at diagnosis:** One in seven people diagnosed with HIV during 2017 were identified within six months after acquiring HIV, which allows for early initiation of antiretroviral medications, and potentially less opportunity for transmission. On the other hand, one in six 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 2012 (39%) to 2017 (21%).

**Diagnosed outside of Wisconsin:** In addition to the 259 Wisconsin residents diagnosed with HIV during 2017, 231 individuals previously diagnosed with HIV moved into Wisconsin from another state or country. The number of people living with HIV who migrate into 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, 7,123 individuals reported with HIV were presumed to be alive and living in Wisconsin. Almost three-quarters (72%) of these were first diagnosed in Wisconsin; the others were initially diagnosed elsewhere. The Centers for Disease Control and Prevention (CDC) estimates that 15% of people living with HIV (PLWH) in the U.S. are unaware of their HIV status.

An estimated 1,200 individuals in the state are living with undiagnosed HIV, so the total number of PLWH in Wisconsin is estimated to be about 8,300.

HIV prevalence varies by demographic group. One in three (35%) gay or bisexual Black men is estimated to be living with HIV in Wisconsin, compared to 10% of Hispanic and 4% of White gay and bisexual men (right). Fewer than 1 in 1,000 females and heterosexual males in Wisconsin is HIV-positive.



Nearly half (47%) of all PLWH reside in Milwaukee County. Dane County has the second highest proportion (12%), followed by Racine, Kenosha, and Brown counties, with 4% each.

**Deaths**

Deaths occurring in Wisconsin among people living with HIV have declined markedly since the early 1990s. In 2016, the most recent year with complete data, 79 deaths among people living with HIV are known to have occurred in Wisconsin. HIV as the underlying cause of death is also on the decline—50 of the 79 reported deaths were attributed to causes other than HIV, while 29 had HIV indicated as the underlying cause of death. The median age at death rose from age 37 in 1990 to age 55 in 2016, indicating that people are living longer with HIV.

**HIV Care Continuum**

Eighty-eight percent of people diagnosed with HIV during 2017 were linked to care within three months of diagnosis. Of people diagnosed and living with HIV in Wisconsin, 72% received some care during 2017, 53% had two or more visits, and 65% were virally suppressed.

**IMPLICATIONS**

**HIV diagnoses**

Trends in people first diagnosed in Wisconsin should guide planning for HIV prevention. The number of new diagnoses among men who have sex with men (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. The number of new HIV diagnoses attributed to injection drug use stopped



declining in 2017 and hepatitis C virus diagnoses and heroin overdoses have been on the rise among young adults in rural parts of Wisconsin over the past few years. 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 virus.

### ***HIV prevalence***

HIV prevalence data should guide planning for HIV care and treatment services. The fact that 49% of 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 Wisconsin 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 webpage: <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 virus: <https://www.dhs.wisconsin.gov/viral-hepatitis/hcv-program.htm>

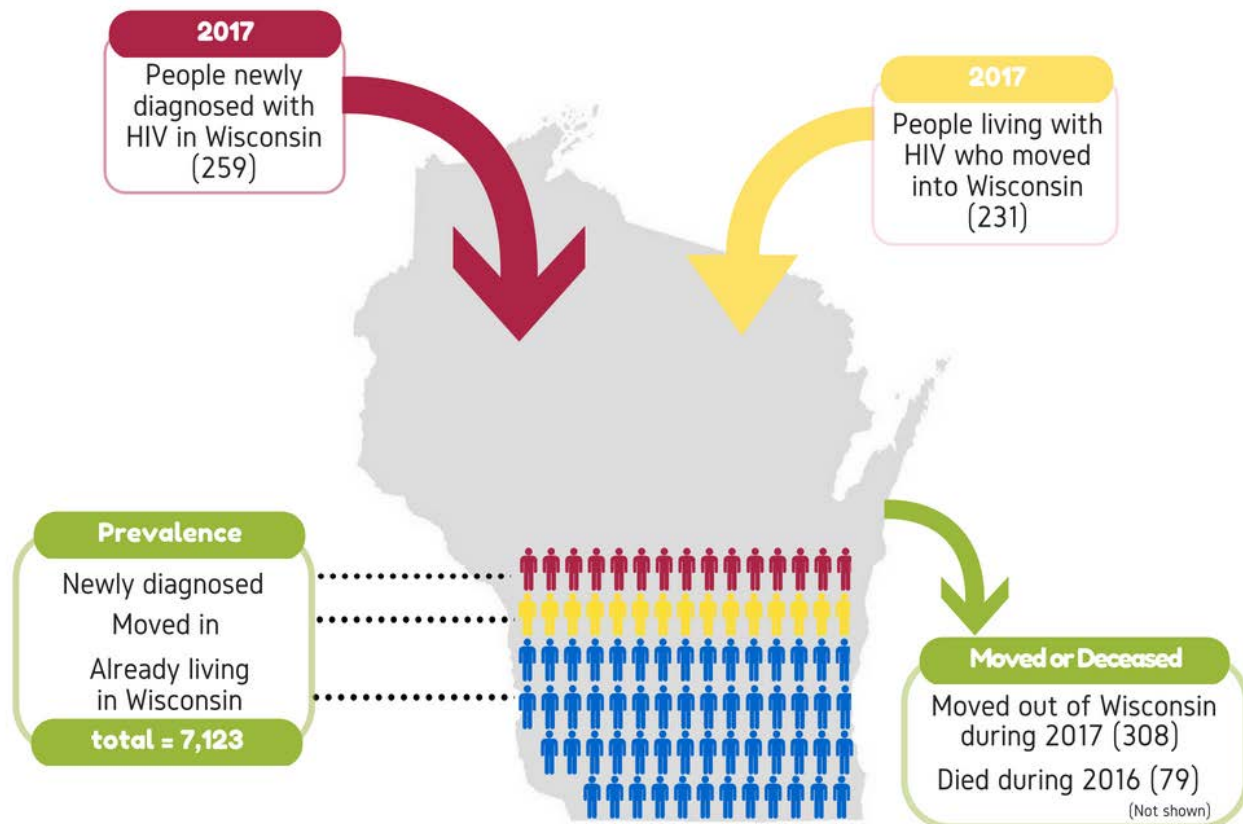
## NEW DIAGNOSES AND PREVALENCE DEFINITIONS

### Total HIV reports

Since the beginning of the HIV epidemic, 14,223 people have been reported with HIV in Wisconsin. Of these, 10,131 (71%) individuals received their first verifiable HIV diagnosis while residing in Wisconsin. The other 29% were first diagnosed with HIV while residing in another state or country and subsequently moved to, and were reported in, Wisconsin.

**New diagnoses** refer to those individuals who received their first verifiable HIV diagnosis while residing in Wisconsin. During 2017 there were 259 new diagnoses of HIV among Wisconsin residents (Figure 1). In addition, there were 231 individuals already diagnosed with HIV who moved into Wisconsin 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 Wisconsin at the end of 2017.

Figure 1: Flow of people with HIV in and out of Wisconsin, 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 Wisconsin, 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.

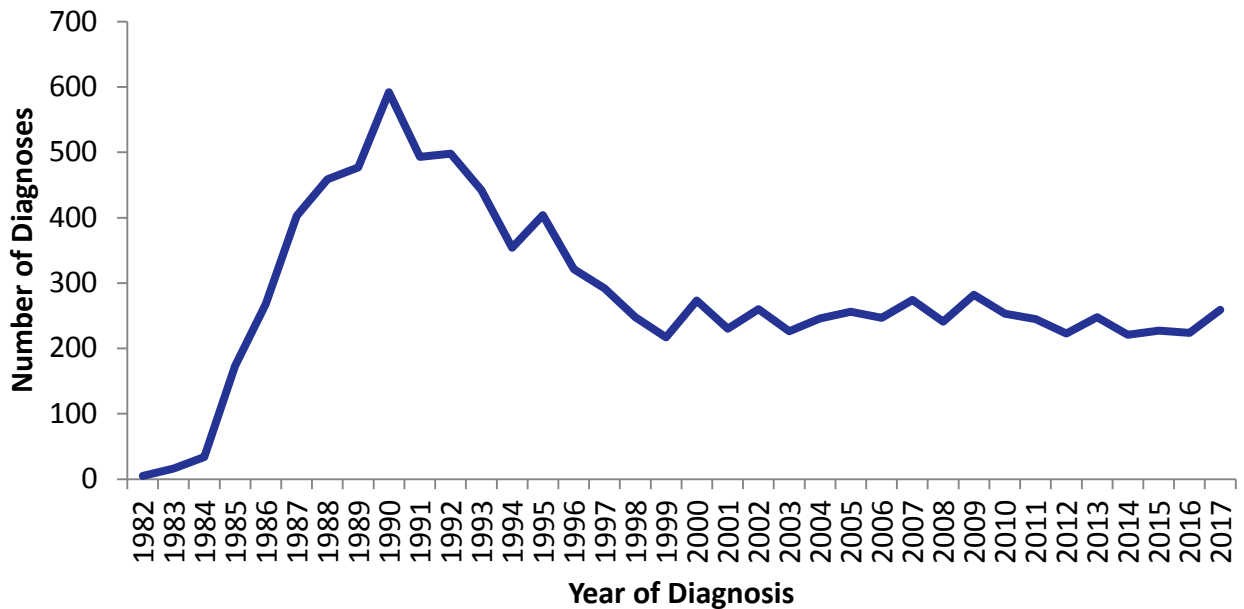
At the end of 2017 there were an estimated 7,123 people diagnosed with HIV living in Wisconsin. However, the CDC estimates that 15% of individuals living with HIV in the U.S. are unaware of their status and, therefore, the actual prevalence of HIV in Wisconsin is likely closer to 8,300.

## NEW DIAGNOSES

### *Number and rate*

A total of 10,131 individuals were first diagnosed and reported with HIV in Wisconsin since the beginning of the HIV epidemic. Diagnoses rose rapidly during the 1980s, peaking in 1992, and then declined until about 2000 (Figure 2).

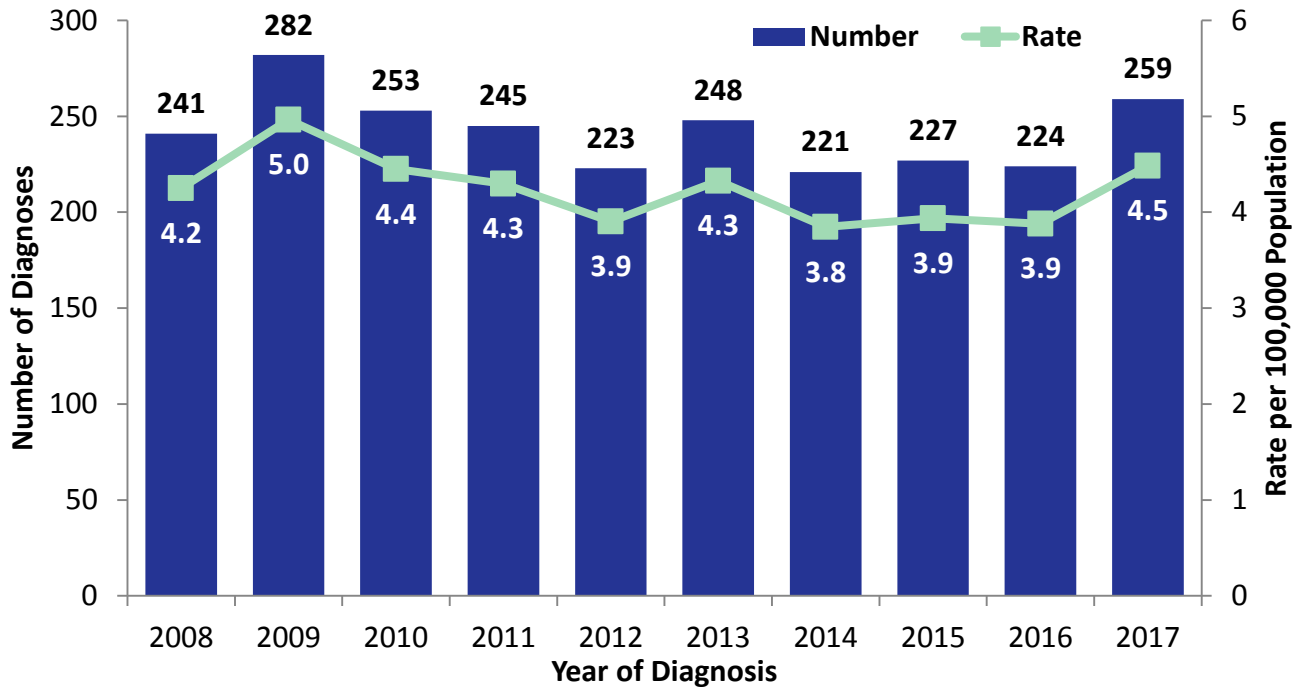
**Figure 2: Number of new HIV diagnoses, Wisconsin, 1982 - 2017**



There were 259 new HIV diagnoses among Wisconsin residents during 2017, corresponding to a diagnosis rate of 4.5 per 100,000 population. Despite more diagnoses in 2017 compared to 2016, both the number and rate of new HIV diagnoses have declined over the past 10 years. (Figure 3). Between 2008 and 2017, the number of diagnoses ranged from a low of 221 (2014) to a high of 282 (2009), with an average of 242 per year.

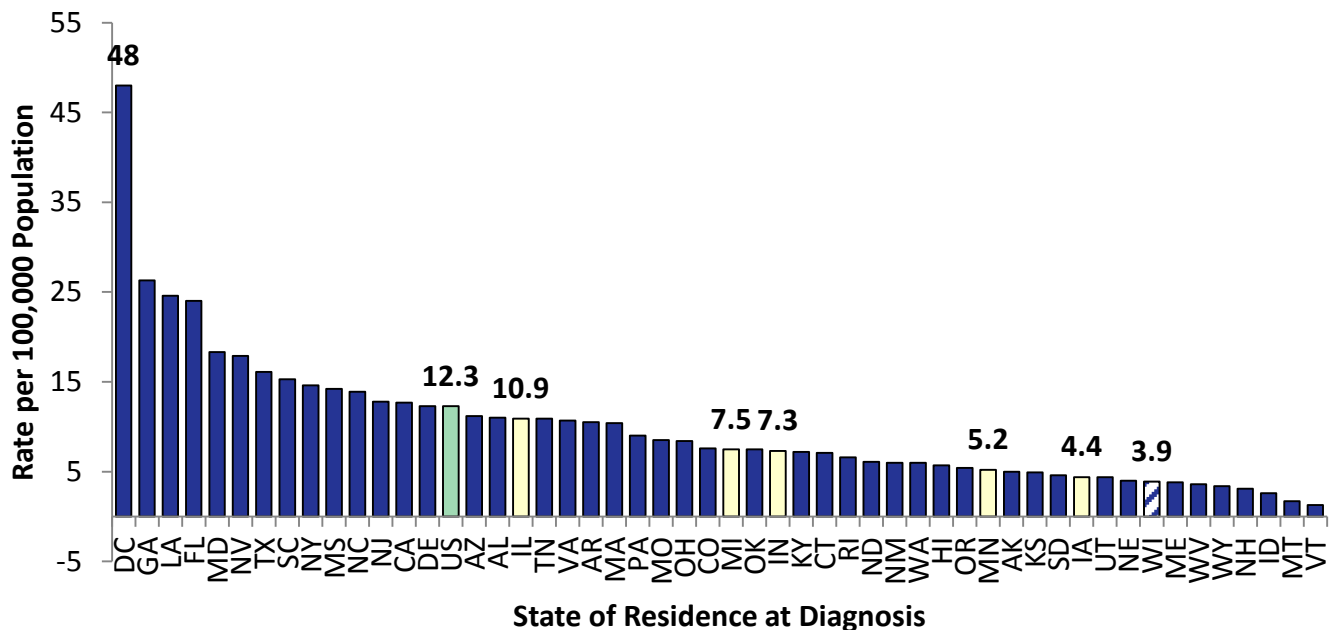


Figure 3: Number and rate of new HIV diagnoses, Wisconsin, 2008-2017



Wisconsin’s HIV diagnosis rate is low by national standards. The most recently available estimate for the national HIV diagnosis rate (2016)<sup>1</sup> is 12.3 diagnoses per 100,000 (Figure 4), while Wisconsin’s estimated diagnosis rate was 3.9 per 100,000 population.

Figure 4: Estimated HIV diagnosis rate<sup>1</sup> by state, 2016



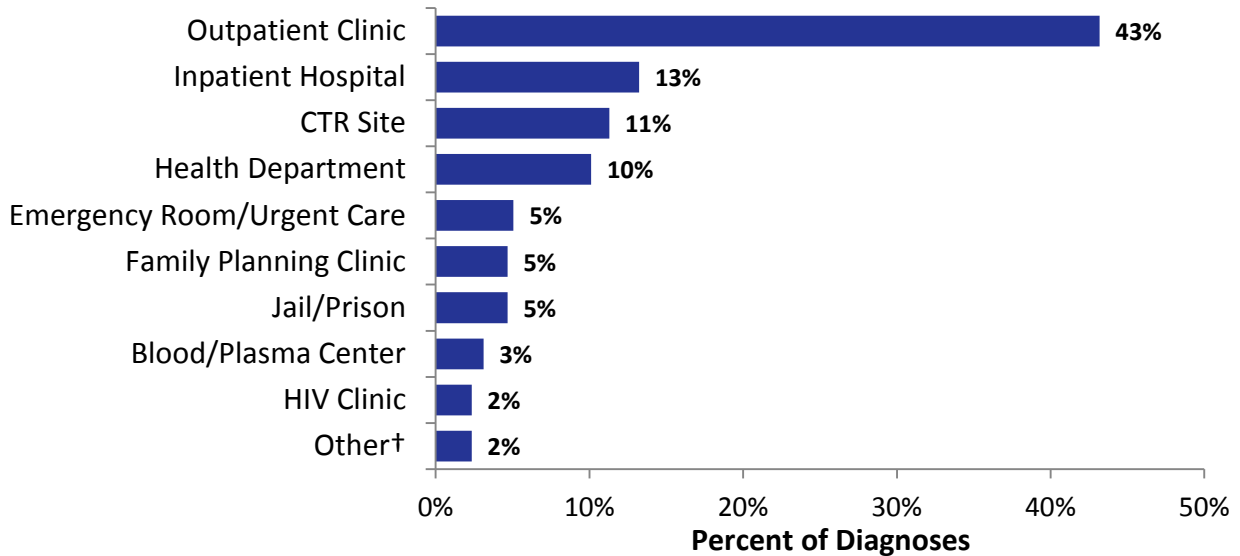
<sup>1</sup> Centers for Disease Control and Prevention. *HIV Surveillance Report, 2016*; vol. 28. <http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html>. Published November 2017.



**Type of facility providing diagnosis**

During 2017, the most common settings for HIV diagnoses were outpatient clinic (43%); inpatient hospital (13%); counseling, testing and referral (CTR) site (11%); and health department (10%) (Figure 5).

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

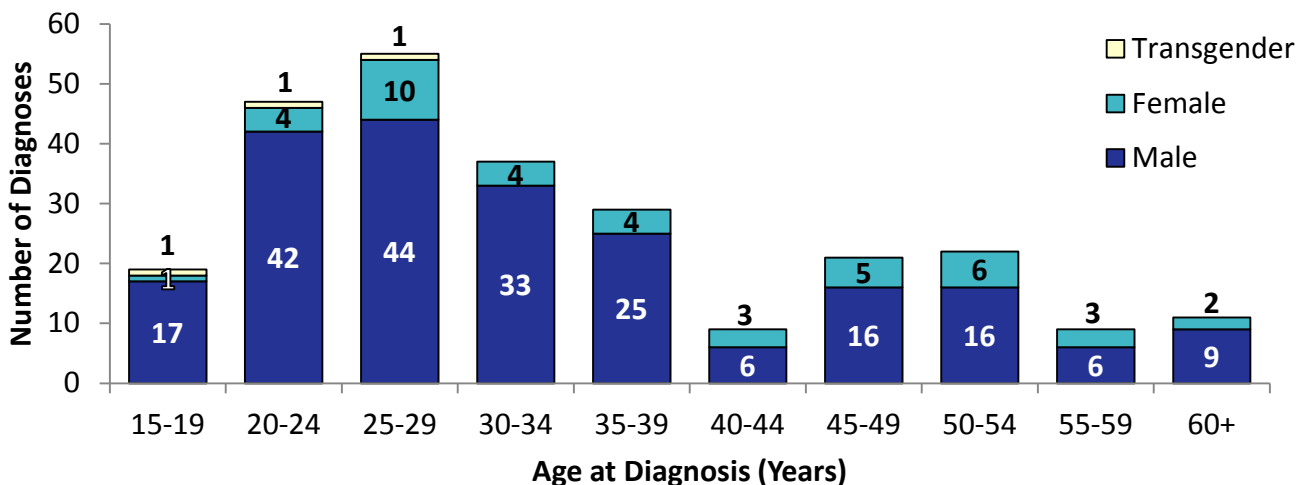


†Other includes diagnosis at a student health center, through the military or life insurance, and at a mail order or direct access testing facility.

**Gender and age at diagnosis**

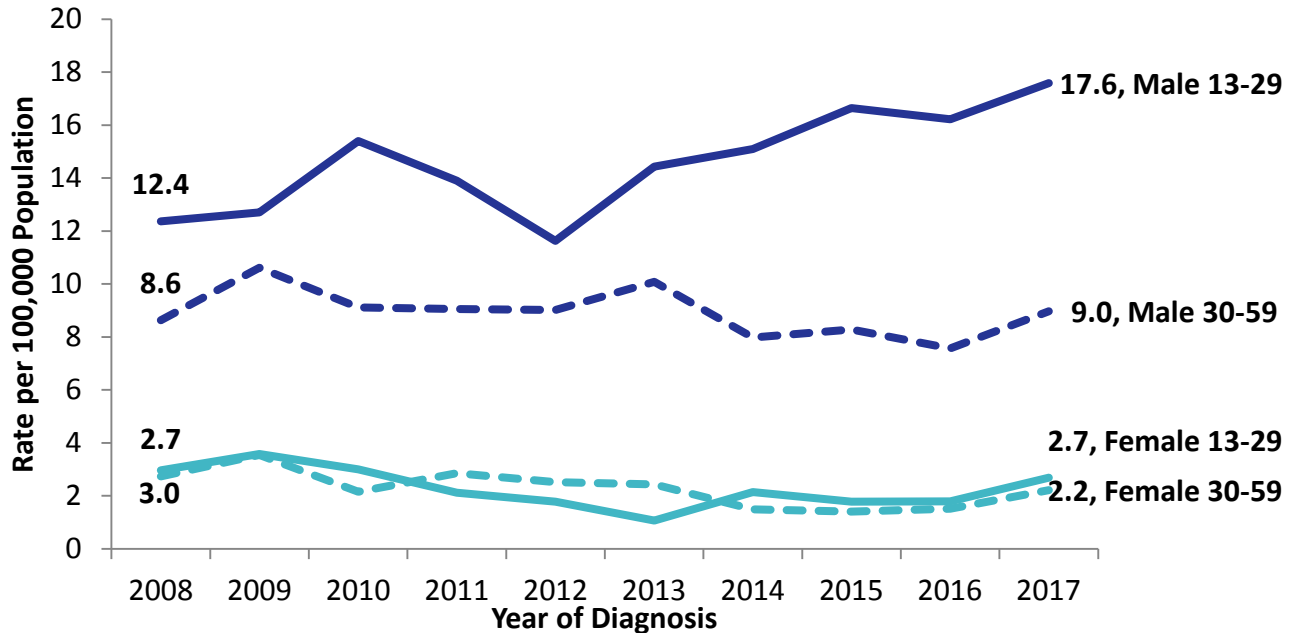
During 2017, 214 males, 42 females, and 3 transgender individuals were diagnosed with HIV in Wisconsin. The median age at diagnosis (the age at which half of people were older at the time of diagnosis and half were younger) was 31 years, with a range of 16-67 years. Newly diagnosed males were generally younger than newly diagnosed females. The median age at diagnosis was 30 years for males and 36 years for females; there were too few transgender individuals to calculate median age. Age at diagnosis by gender is shown in Figure 6.

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



Over the last decade (2008-2017) the HIV diagnosis rate increased among younger males (ages 13-29) from 12.4 per 100,000 to 17.6 per 100,000, and fluctuated among older males (ages 30-59) (Figure 7). The diagnosis rate also declined among older females and fluctuated among younger females. Diagnosis rates among males and females ages 60 and older are unreliable due to small numbers.

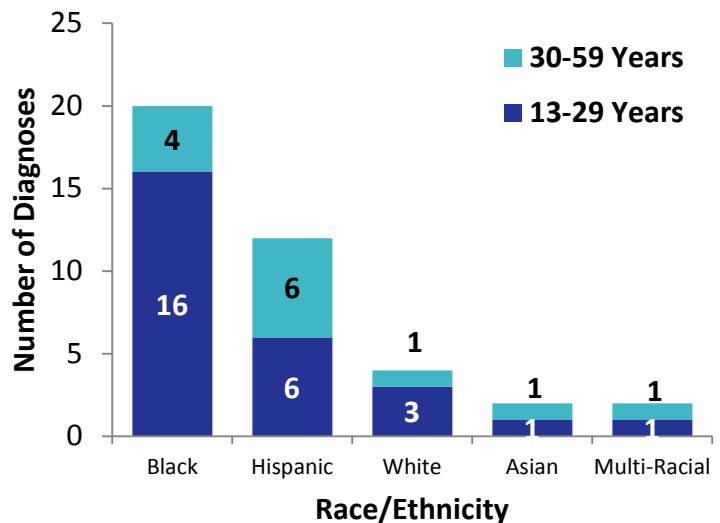
**Figure 7: HIV diagnosis rate by age at diagnosis and sex, Wisconsin, 2008-2017**



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



A total of 56 transgender individuals have been diagnosed with HIV in Wisconsin since the beginning of the epidemic (5 female-to-male and 51 male-to-female). While the data collection of self-reported gender identity has improved over time, this likely underestimates the true number of diagnoses among transgender individuals in Wisconsin. Of the 56 diagnoses, 40 occurred between 2008 and 2017 (Figure 8). Of these, the majority of individuals were from a racial or ethnic minority group (n=38) and were under age 30 (n=27). The 40 recent diagnoses were attributed to sexual contact (n=36) or both sexual contact and injection drug use (n=1); transmission category is unknown for three people.

**Race/ethnicity**

During 2017, two-thirds of individuals (61%) newly diagnosed with HIV were members of minority racial or ethnic groups, yet racial/ethnic minorities made up just 17% of the state’s population (Figure 9). 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 persons of color and can put individuals at greater risk for acquiring HIV.<sup>2</sup>

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

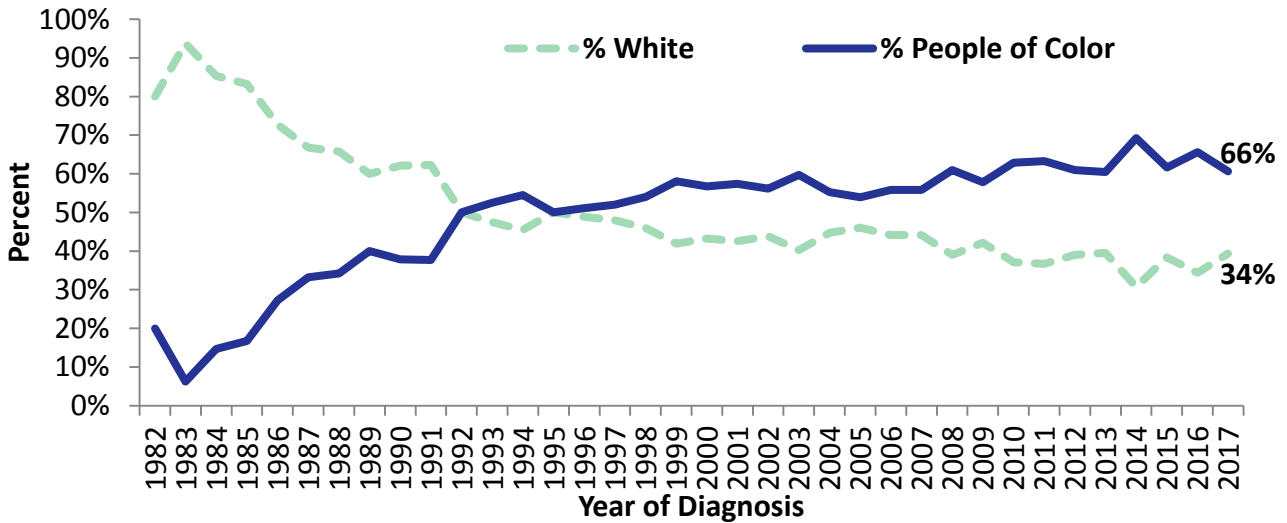
**Table 1: Number and percentage of new HIV diagnoses by sex and race/ethnicity, Wisconsin, 2017**

	Black	White	Hispanic	American Indian	Asian	Multi-Racial	Total
Male	86 (40%)	87 (41%)	29 (14%)	1 (<1%)	2 (1%)	9 (4%)	214
Female	21 (50%)	15 (36%)	3 (7%)	-	1 (2%)	2 (5%)	42
Transgender	3 (100%)	-	-	-	-	-	3
<b>TOTAL</b>	<b>110 (42%)</b>	<b>102 (39%)</b>	<b>32 (12%)</b>	<b>1 (&lt;1%)</b>	<b>3 (1%)</b>	<b>11 (4%)</b>	<b>259</b>

<sup>2</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.



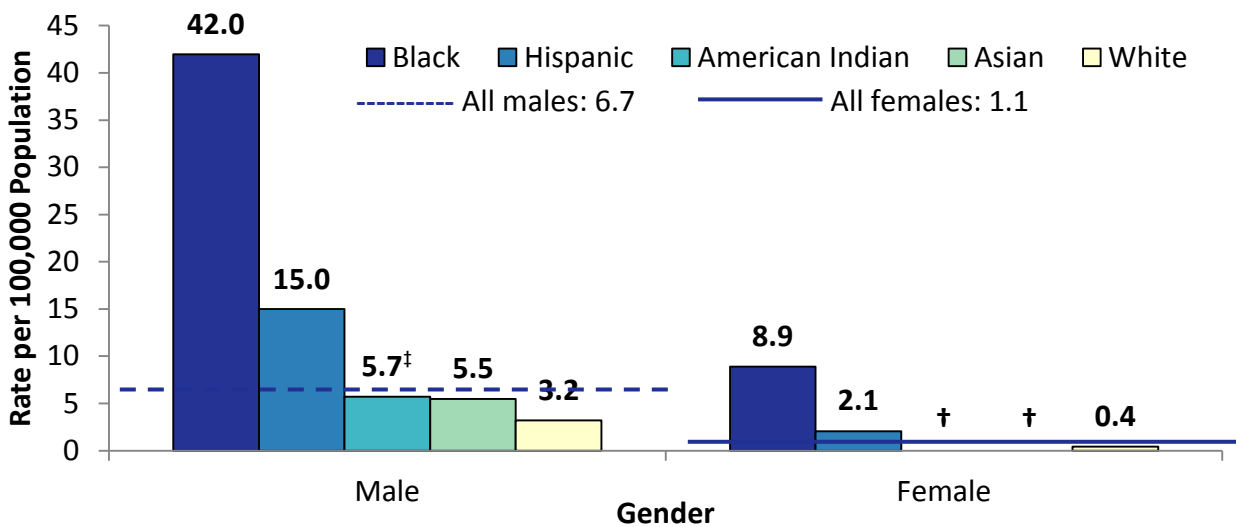
**Figure 9: Percentage of new HIV diagnoses among Whites and people of color, Wisconsin, 1982-2017**



**Race/ethnicity and gender**

The HIV diagnosis rate further highlights the disproportionate impact of HIV on racial/ethnic minorities. During 2013-2017, the average annual HIV diagnosis rate for males was thirteenfold higher among Blacks, fivefold higher among Hispanics, and almost twofold higher among Asians and American Indians compared to Whites (Figure 10). For females, the HIV diagnosis rate was twenty-onefold higher among Blacks and fivefold higher among Hispanics compared to Whites. Sixteen transgender individuals are excluded from this analysis as population denominators are not available to calculate rates.

**Figure 10: HIV diagnosis rate by gender and race/ethnicity, Wisconsin, 2013-2017**



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

‡Rates are statistically unreliable due to counts <12.

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





significant changes among the other groups. Forty transgender individuals are excluded from this analysis as population denominators are not available to calculate rates.

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

Year of Diagnosis	Black Male	White Male	Hispanic Male	Black Female	White Female	Hispanic Female
2008	38.3	3.4	14.6	16.7	0.5	3.4 <sup>†</sup>
2009	37.8	4.3	16.9	18.6	0.7	3.9 <sup>†</sup>
2010	45.9	3.6	13.6	15.1	0.4 <sup>†</sup>	†
2011	40.6	3.2	16.6	11.4	0.5	5.5 <sup>†</sup>
2012	36.1	3.1	16.2	12.3	0.6	3.0 <sup>†</sup>
2013	41.0	3.8	17.5	10.2	0.3 <sup>†</sup>	3.4 <sup>†</sup>
2014	40.6	2.5	19.7	8.6	0.3 <sup>†</sup>	2.8 <sup>†</sup>
2015	39.8	3.2	14.2	7.0	0.4 <sup>†</sup>	†
2016	44.7	2.9	10.0	8.5	0.4 <sup>†</sup>	†
2017	44.2	3.7	14.5	10.5	0.6	†

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

‡Rates are statistically unreliable due to counts <12.

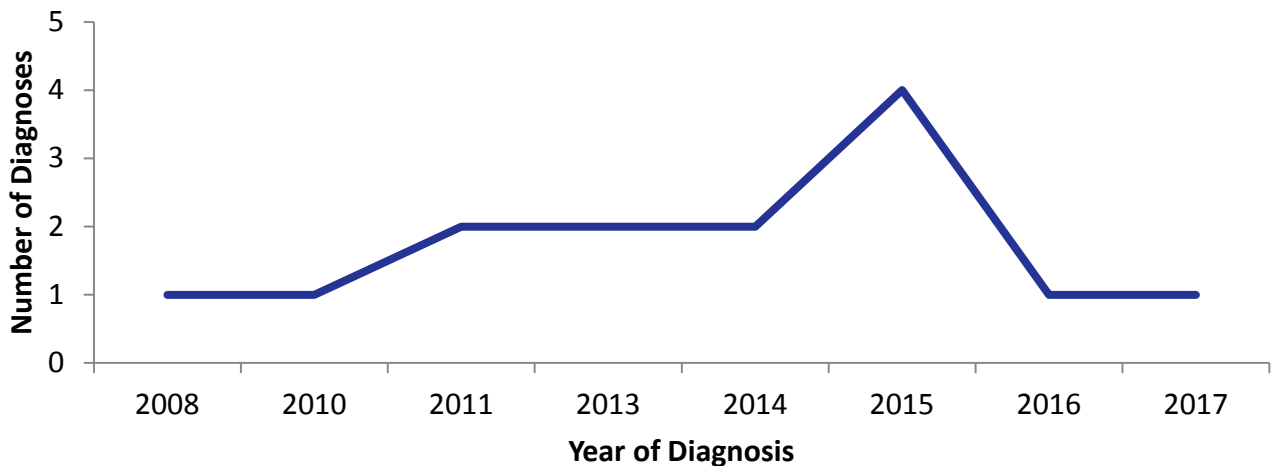
**American Indians and Asians**

Due to the small number of American Indians and Asians diagnosed in Wisconsin each year, these populations are excluded from many sections of the HIV Surveillance Annual Review. Additional information for these populations is presented here.

**American Indians**

During 2008-2017, 14 American Indians were diagnosed with HIV in Wisconsin, with an average of about two new diagnoses per year (Figure 11).

**Figure 11: Number of HIV diagnoses among American Indians, Wisconsin, 2008-2017**



The demographics are as follows:

- At the time of diagnosis, 43% were under age 30.

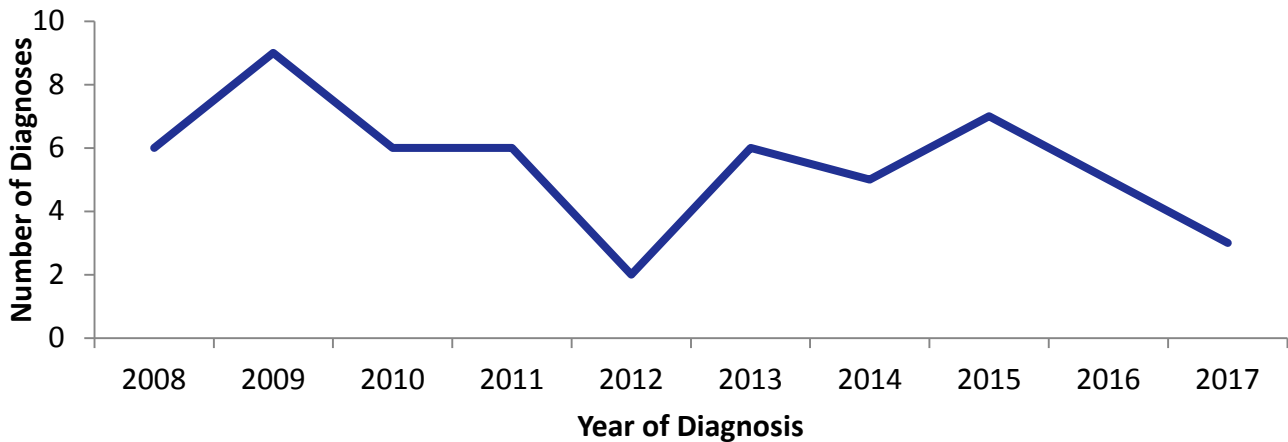


- Of the total, 43% were diagnosed in the southeastern region, 21% in the northern region, 14% in each the northeastern and southern regions, and 7% in the western region.
- Nine of the diagnoses were attributed to male-male sexual contact and one to injection drug use; four had unknown transmission category.

**Asians**

During 2008-2017, 55 Asians were diagnosed with HIV in Wisconsin, with an average of about six new diagnoses per year (Figure 12).

**Figure 12: Number of HIV diagnoses among Asians, Wisconsin, 2008-2017**



The demographics are as follows:

- Of the total, 76% were male, 20% were female, and 4% were transgender individuals.
- At the time of diagnosis, 40% were under age 30.
- Of the total, 55% were diagnoses in the southeastern region, 22% in the southern region, 9% in the northeastern region, and 7% each in the northern and western regions.
- Of the total, 53% of diagnoses were attributed to male-male sexual contact, including 4% with injection drug use; 16% to heterosexual contact, and 2% to sexual contact; 29% had unknown transmission category.

**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 categories for people diagnosed with HIV in Wisconsin 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, Wisconsin, 2017**

	MSM <sup>†</sup>	MSM and IDU <sup>‡</sup>	IDU	Hetero-sexual Contact	Sexual Contact	Unknown	Total
Male	152 (71%)	6 (3%)	12 (6%)	5 (2%)	-	39 (18%)	214
Female	-	-	5 (12%)	14 (33%)	-	23 (55%)	42
Transgender	-	-	-	-	3 (100%)	-	3
<b>TOTAL</b>	152 (59%)	6 (2%)	17 (7%)	19 (7%)	3 (1%)	62 (24%)	259

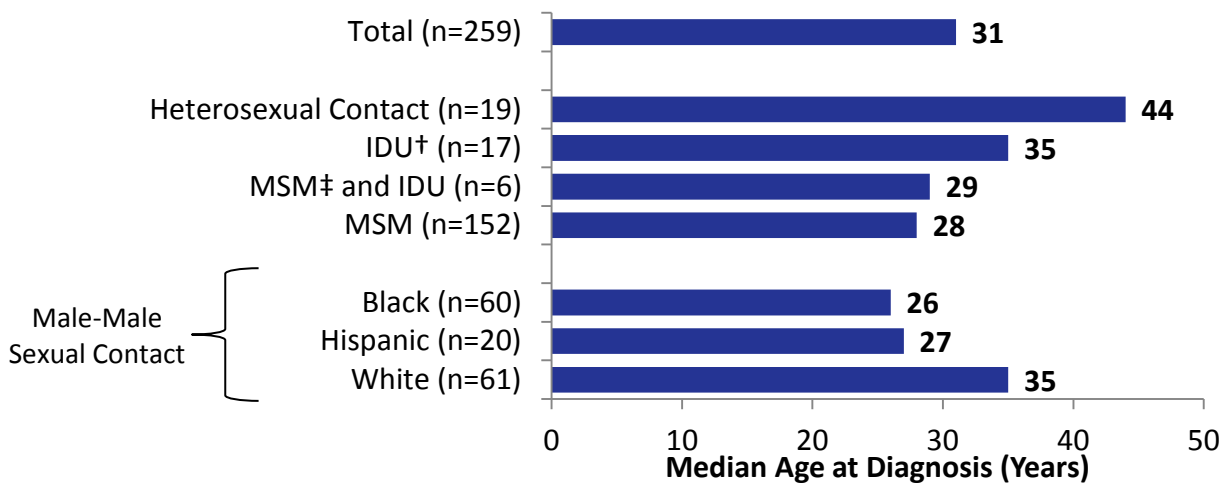
<sup>†</sup>MSM=male-male sexual contact

<sup>‡</sup>IDU=injection drug use

**Transmission category based on reported risk and age**

The median age at HIV diagnosis during 2017 was 31 years, with variation by transmission category and within transmission category (Figure 13). For men whose diagnoses were attributed to male-male sexual contact, the median age at diagnosis was 28 years; Black and Hispanic men tended to be younger (median ages of 26 and 27 years, respectively) than White men (median age 35 years) at the time of diagnosis. The median age at diagnosis among individuals with diagnoses attributed to injection drug use alone or heterosexual contact was 35 and 44 years, respectively.

**Figure 13: 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, Wisconsin, 2017**



<sup>†</sup>IDU=injection drug use

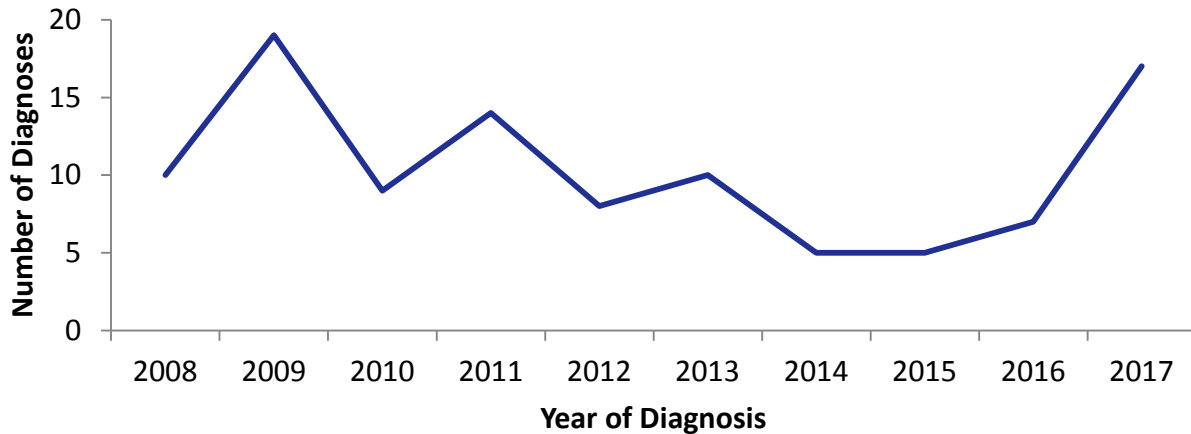
<sup>‡</sup>MSM=male-male sexual contact

**Injection Drug Use**

During 2017 there were 17 diagnoses attributed to injection drug use, more than double that reported in recent years (Figure 14). Seventy-one percent of individuals were White, 18% were Black, and 6% each were Hispanic and multiracial. Individuals were more likely to be male (n=12) and over age 30 (n=13). Diagnoses were geographically distributed, but half (n=9) were in Milwaukee County.



**Figure 14: HIV diagnoses attributed to injection drug use, Wisconsin, 2017**

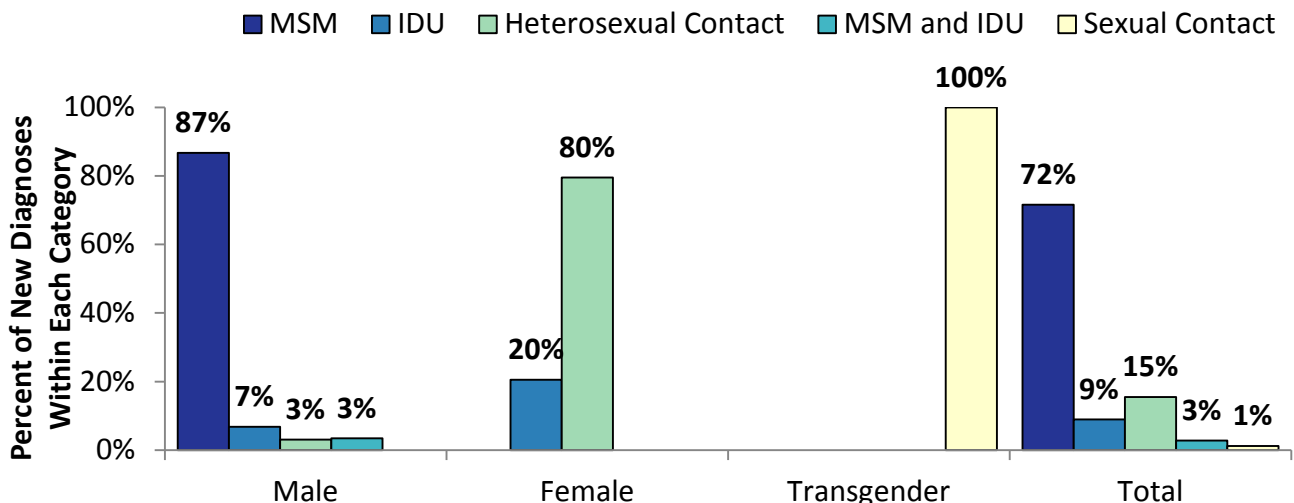


**Estimated transmission category**

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, including 3% of MSM who also injected drugs, 15% to heterosexual contact, % to injection drug use, and 1% to sexual contact (Figure 15).

Among males, after adjusting to account for those with unknown transmission category, 90% of diagnoses were attributed to male-male sexual contact, including 3% due to both male-male sexual contact and injection drug use, 3% were attributed to heterosexual contact, and 7% were attributed to injection drug use (Figure 15). Among females, 80% of diagnoses were attributed to heterosexual contact and 20% to injection drug use. Among transgender individuals, all diagnoses were attributed to sexual contact.

**Figure 15: Percentage of HIV diagnoses by gender and estimated transmission category<sup>†</sup>, Wisconsin, 2017**

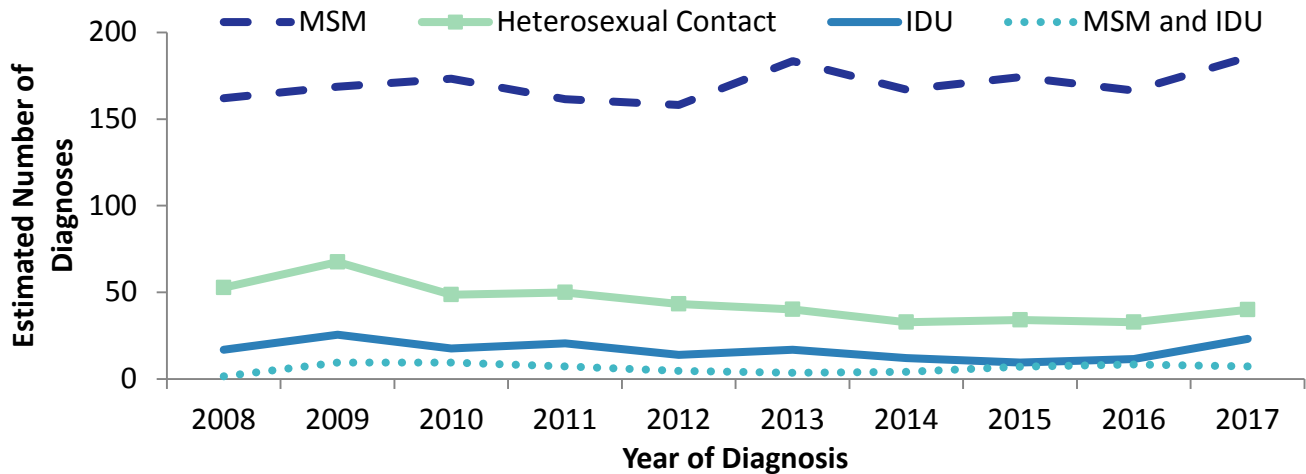


<sup>†</sup>Data have been statistically adjusted to account for those with unknown transmission category.



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 16). Despite stability in the total number of new diagnoses attributed to male-male sexual contact, there were differences within subgroups (see below). Due to the larger number of diagnoses attributed to injection drug use during 2017 (n=23) compared to 2016 (12), there is no longer a statistical decline in new HIV diagnoses attributed to injection drug use over the past 10 years.

**Figure 16: HIV diagnoses by estimated transmission category<sup>†</sup>, Wisconsin, 2008-2017**

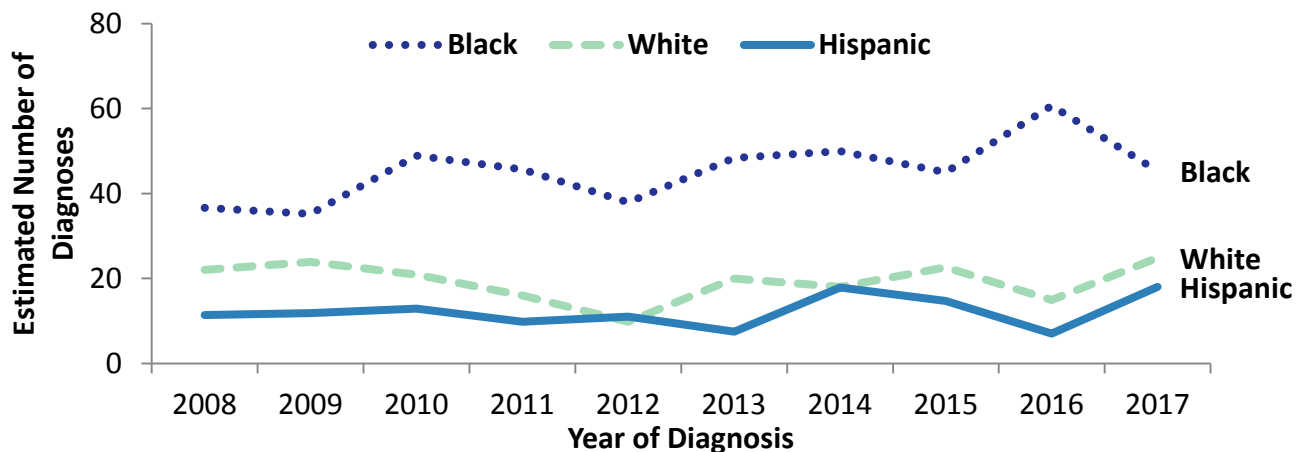


<sup>†</sup>Data have been statistically adjusted to account for those with unknown transmission category.

**Young men by race/ethnicity**

Among the 97 young men (ages 13-29) diagnosed with HIV during 2017 whose HIV was attributed to male-male sexual contact, 47% were Black, 26% were White, and 19% were Hispanic. While the number of diagnoses in 2017 was less than during 2016, there has still been a statistical increase in HIV among young Black MSM over the last decade (Figure 17). On the other hand, while the number of diagnoses among young White and Hispanic MSM was *greater* in 2017 than 2016, there is no statistical trend over the last 10 years.

**Figure 17: HIV diagnoses attributed to male-male sexual contact<sup>†</sup>, ages 13-29, by race/ethnicity, Wisconsin, 2008-2017**



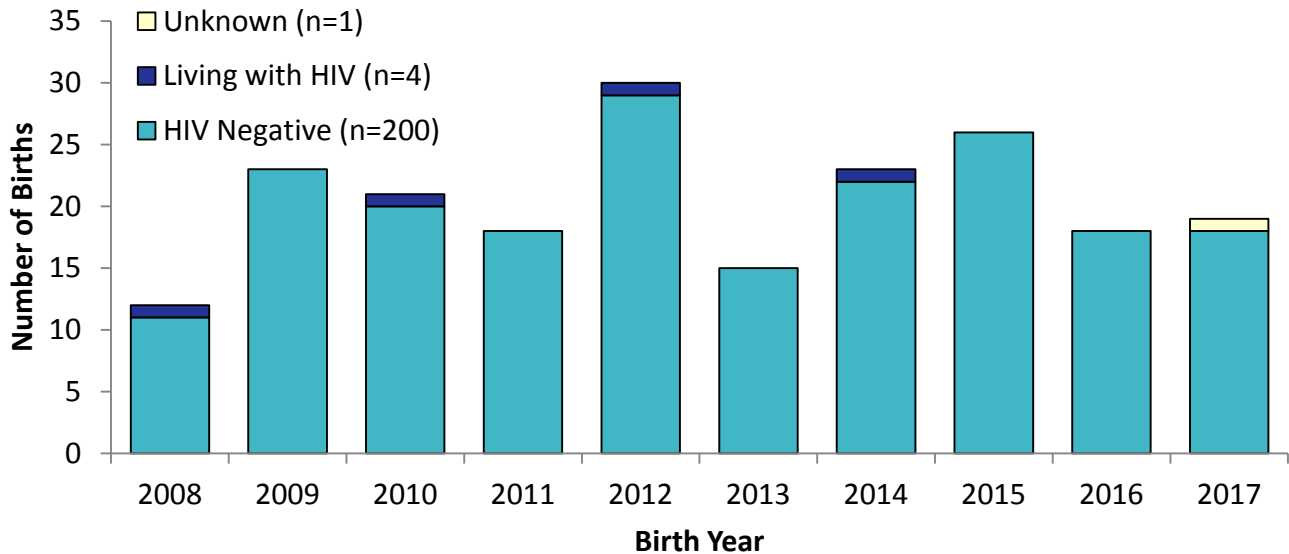
<sup>†</sup>Data have been statistically adjusted to account for those with unknown transmission category.



***Pediatric HIV and perinatal exposure***

During 2008-2017, there were 205 infants born in Wisconsin or whose mother was a resident of Wisconsin, who were exposed to HIV through childbirth. Of these infants, 200 (98%) are HIV negative, four are living with HIV (2%), and 1 has unknown diagnostic status due to the recency of birth (Figure 18).

**Figure 18: Diagnostic status of HIV-exposed infants born in Wisconsin or whose mother lived in Wisconsin at the time of birth, 2008-2017**



***Birth country***

Among the 259 individuals first diagnosed with HIV in Wisconsin during 2017, most (248) were born in the U.S. or were likely born in the U.S. (unreported country of birth). The other 11 people were born outside of the U.S.

***County of residence***

During 2017, new HIV diagnoses were made among residents from 36 Wisconsin counties. Counties with the largest numbers of new diagnoses were Milwaukee (131), Dane (25), Racine (11), Kenosha (9), Outagamie and Winnebago (8 each), and La Crosse (6) (Table 4). All other counties had five or fewer new diagnoses each. There were nine new diagnoses made within the Department of Corrections among inmates during admission into prison.



**Table 4: Number, percent, and rate of new HIV diagnoses by county of residence, Wisconsin, 2017**

County of Residence	Number	Percent	Rate <sup>†</sup>
Barron	2	0.8%	-
Brown	4	1.5%	-
Calumet	1	0.4%	-
Chippewa	1	0.4%	-
Dane	25	9.7%	4.8
Dodge	1	0.4%	-
Door	3	1.2%	-
Douglas	1	0.4%	-
Iowa	1	0.4%	-
Iron	1	0.4%	-
Jefferson	1	0.4%	-
Kenosha	9	3.5%	5.4 <sup>‡</sup>
La Crosse	6	2.3%	5.1 <sup>‡</sup>
Manitowoc	2	0.8%	-
Marathon	2	0.8%	-
Marinette	1	0.4%	-
Milwaukee	131	50.6%	13.8
Monroe	1	0.4%	-
Oconto	1	0.4%	-
Outagamie	8	3.1%	4.4 <sup>‡</sup>
Ozaukee	1	0.4%	-
Polk	2	0.8%	-
Portage	3	1.2%	-
Racine	11	4.2%	5.6 <sup>‡</sup>
Rock	3	1.2%	-
Sauk	2	0.8%	-
Sheboygan	2	0.8%	-
St. Croix	1	0.4%	-
Vernon	1	0.4%	-
Walworth	1	0.4%	-
Washington	5	1.9%	3.7 <sup>‡</sup>
Waukesha	5	1.9%	1.3 <sup>‡</sup>
Waupaca	1	0.4%	-
Winnebago	8	3.1%	4.7 <sup>‡</sup>
Wood	2	0.8%	-
Department of Corrections	9	3.5%	-
<b>TOTAL</b>	<b>259</b>	<b>100%</b>	<b>4.5</b>

<sup>†</sup>Rates calculated for counts  $\geq$  five.

<sup>‡</sup>Estimate is statistically unreliable due to counts  $<12$ .

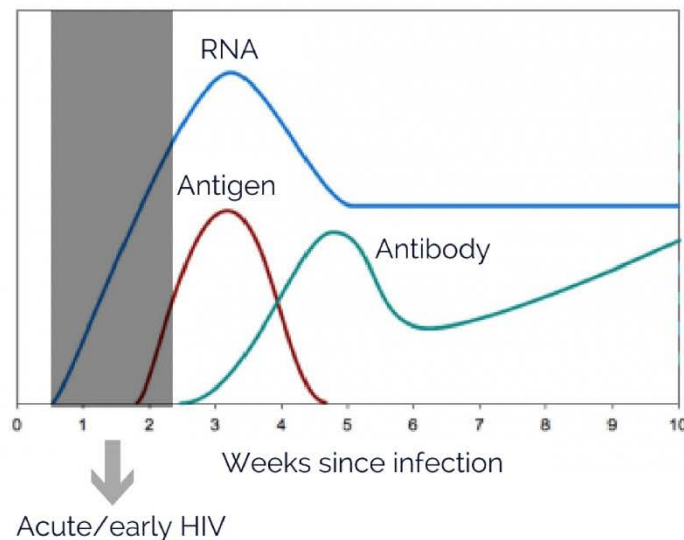


## HIV STAGE AT DIAGNOSIS

### *Acute and recent HIV*

For this report, acute HIV is when an individual is diagnosed with HIV in the 2-4 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 (Figure 19). 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 19: Window of laboratory-confirmed acute HIV infection**



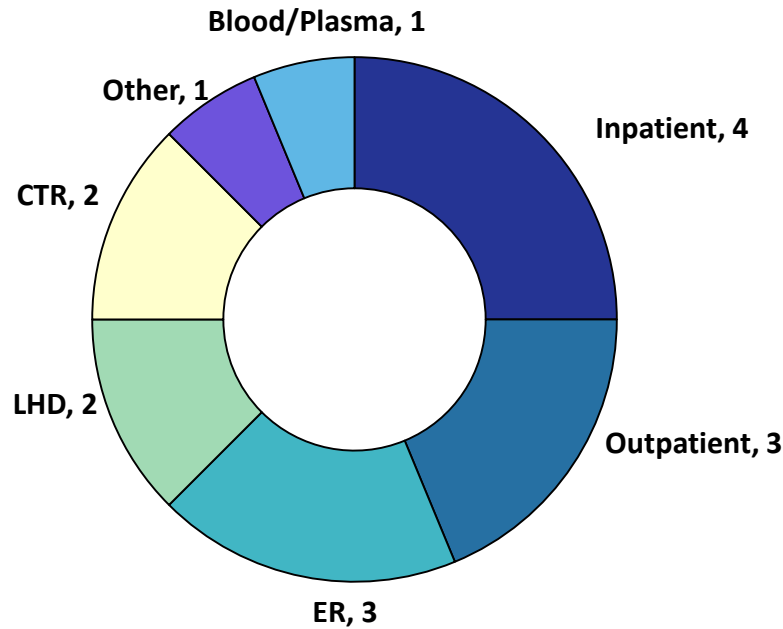
During 2017 there were an estimated 41 individuals diagnosed with acute or recent HIV:

- Of the 41, 16 people met the acute HIV definition based on the laboratory testing algorithm or the presence of acute symptoms.
- An additional 25 people reported a negative 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 16 people with evidence of acute HIV, most were diagnosed at an inpatient facility or emergency room (Figure 20).



**Figure 20: Facility<sup>†</sup> of diagnosis among persons with confirmed acute HIV, Wisconsin, 2017**



<sup>†</sup>ER=emergency room, LHD=local health department, CTR=counseling, testing, and referral site

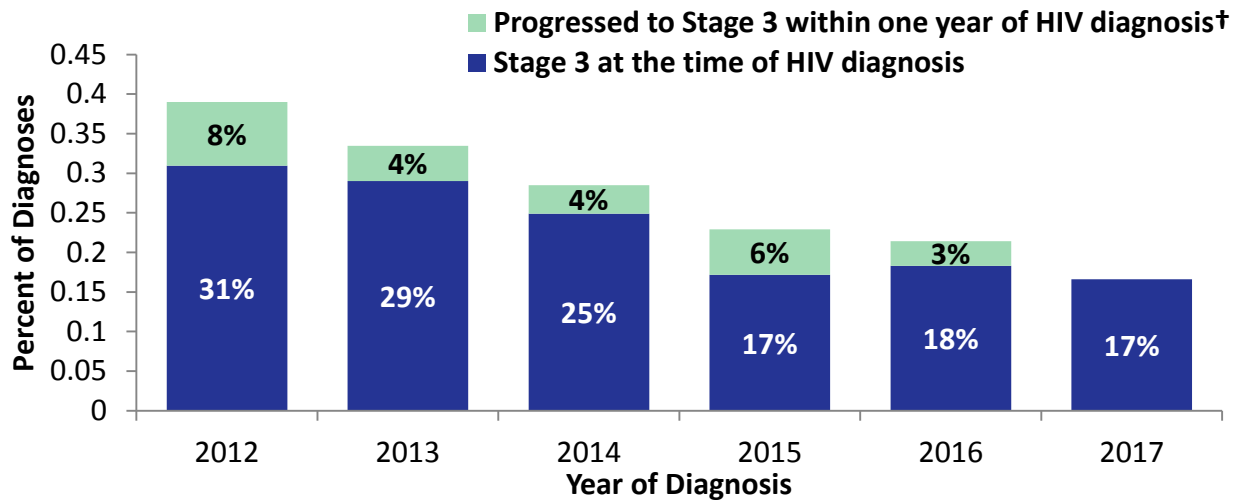
### ***Late diagnosis***

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 10 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 thus 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 Wisconsin who had already progressed to Stage 3 by the time they were first diagnosed with HIV declined from 31% in 2012 to 17% in 2017 (Figure 21). 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 39% in 2012 to 21% in 2016.

**Figure 21: 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, Wisconsin, 2012-2017**

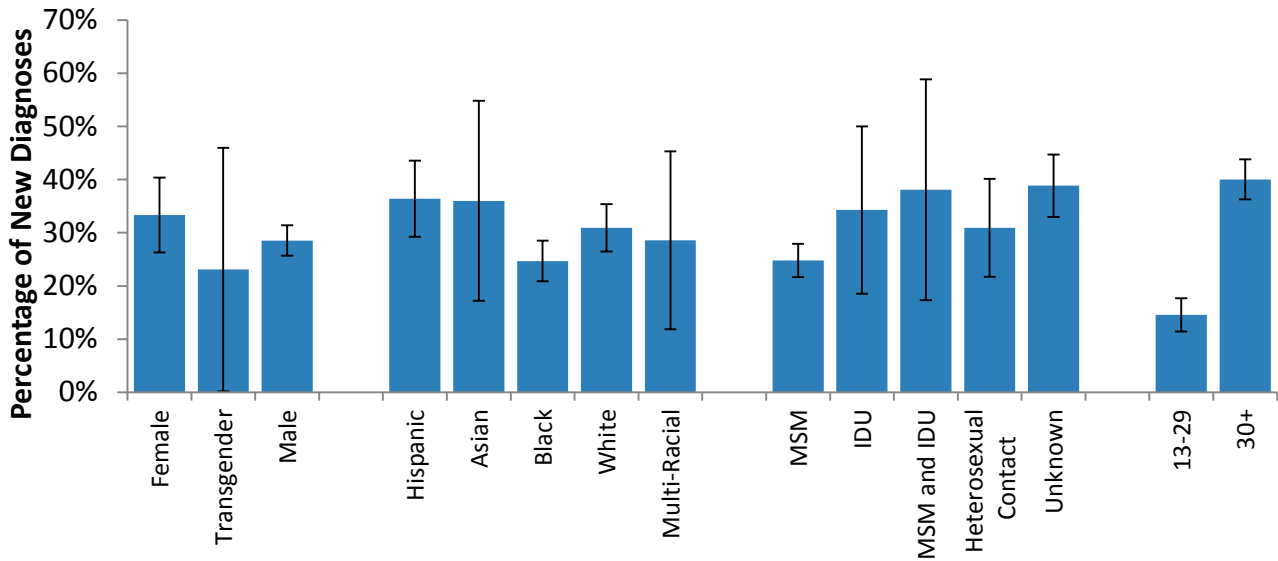


†Those diagnosed with HIV during 2017 have not had one full year to evaluate progression to Stage 3 and therefore this category is excluded.

The proportion of individuals diagnosed in Wisconsin 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 22 by demographic group. The following groups were more likely to have progressed to Stage 3 within a year of HIV diagnosis: Whites and Hispanics compared to Blacks, those with an unknown transmission category compared to those with diagnoses attributed to male-male sexual contact, and people over the age of 30 at the time of diagnosis compared to people ages 13-29 years.



**Figure 22: 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, Wisconsin, 2012-2016†**

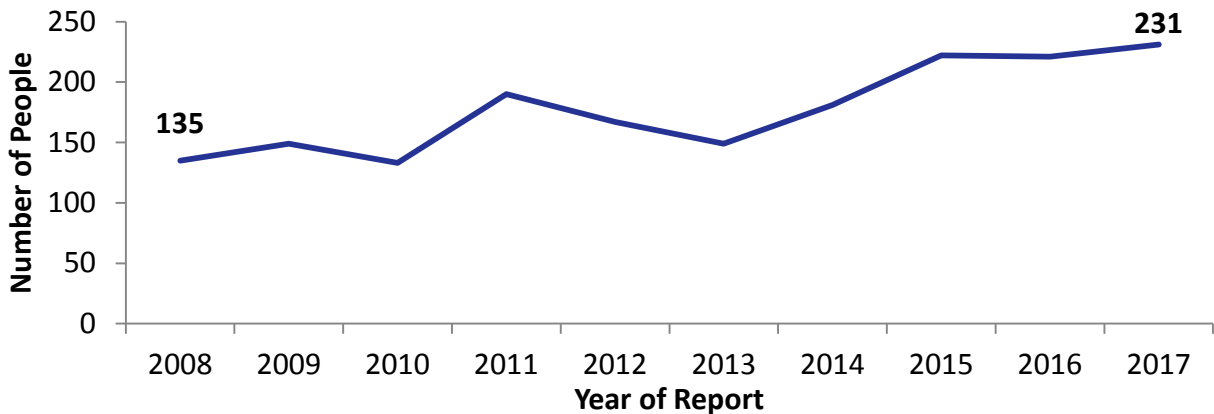


†Bars indicate 95% confidence interval.

### IN-MIGRATION

Each year individuals who were previously diagnosed with HIV in another state or country move into Wisconsin and are reported to the HIV Surveillance Program. The number of people moving into Wisconsin increased from 135 in 2008 to 231 in 2017 (Figure 23).

**Figure 23: Number of people previously diagnosed with HIV moving into Wisconsin, 2008-2017**



A comparison of people newly reported with HIV due to a new diagnosis, versus those reported because they moved into Wisconsin, is shown in Table 5. People newly reported because they moved into Wisconsin were more likely to be older and have a known transmission category compared to people newly reported due to a new HIV diagnosis. The demographics of those moving into Wisconsin more closely resemble the demographics of people already living with HIV rather than those newly diagnosed with HIV.



**Table 5: Comparison of 2017 new HIV reports: Wisconsin HIV diagnoses versus in-migration**

	Wisconsin, Newly Diagnosed # (%)	In-Migration # (%)
<b>Total</b>	<b>259 (100%)</b>	<b>231 (100%)</b>
<b>Sex</b>		
Male	214 (83%)	177 (77%)
Female	42 (16%)	46 (20%)
Transgender	3 (<1%)	8 (3%)
<b>Median Age (Years)</b>	<b>31 (16-67)</b>	<b>38 (5-71)</b>
<b>Race and/or Ethnicity</b>		
American Indian	1 (<1%)	1 (<1%)
Asian	3 (1%)	4 (2%)
Black	110 (42%)	96 (42%)
Hispanic	32 (12%)	32 (14%)
White	102 (39%)	87 (38%)
Multiracial	11 (4%)	9 (4%)
Unknown	-	2 (<1%)
<b>Transmission Category</b>		
MSM†	152 (59%)	135 (58%)
IDU‡	17 (7%)	17 (7%)
MSM and IDU	6 (2%)	19 (8%)
Heterosexual Contact	19 (7%)	26 (11%)
Unknown	-	3 (1%)
Perinatal Exposure	62 (24%)	31 (13%)

† MSM=men who have sex with men; IDU=injection drug use

## 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, people already living in Wisconsin, and people that move into Wisconsin. In 2017, there were 7,123 people living with diagnosed HIV in Wisconsin.

### ***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>3</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 (Figure 24).

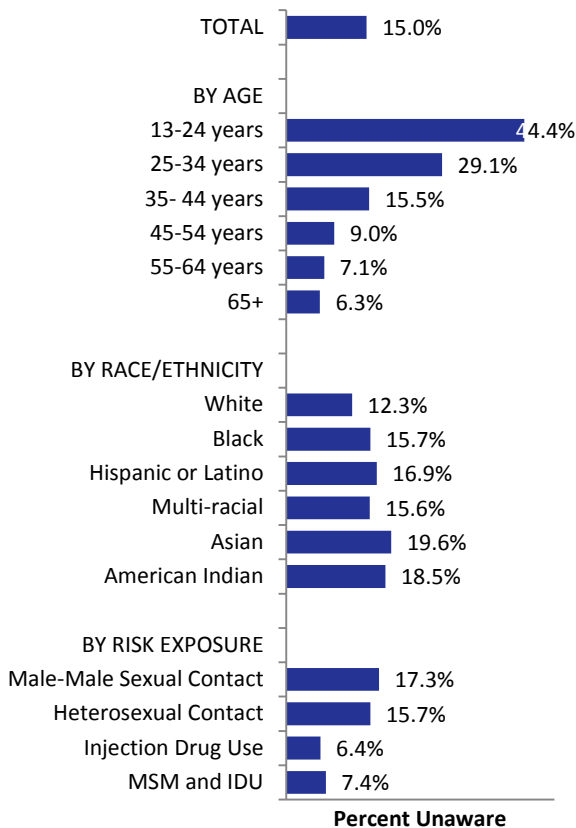
<sup>3</sup> Centers for Disease Control and Prevention. Monitoring selected national HIV prevention and care objectives by using HIV surveillance data—United States and 6 dependent areas—2015. *HIV Surveillance Supplemental Report 2017*;22 (No. 2). <https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-22-2.pdf> . Published July 2017. Accessed February 2018.



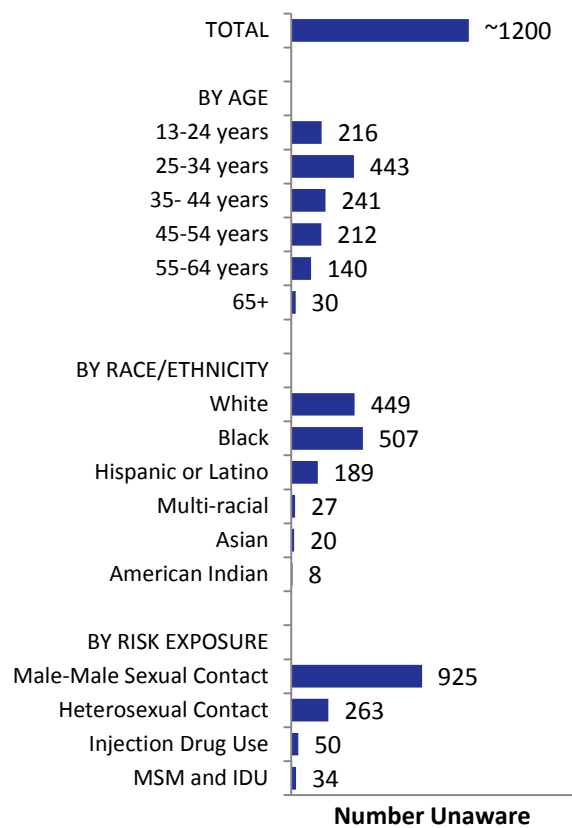
In 2017, CDC provided state-level estimates of the percentage of people living with HIV who were unaware of their status.<sup>4</sup> The estimate for Wisconsin, based on data from 2008-2014, is 16.7% (1 in 6), higher than the national estimate of 15%. Figures 24 and 25 use the national number because demographic breakdowns are not available for the state-level estimates. Readers should bear in mind that the Wisconsin numbers shown may be underestimates.

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.

**Figure 24: Estimated percentage of those living with HIV who are unaware of their status, by demographic group, United States, 2014**



**Figure 25: Estimated number living with HIV who are unaware of their status<sup>†</sup>, by demographic group, Wisconsin, 2017**



<sup>†</sup>Wisconsin numbers using national estimates for the proportion living with HIV who are unaware of their status

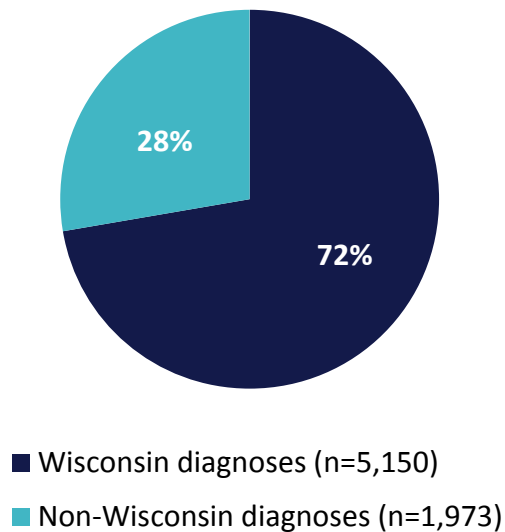
<sup>4</sup> Johnson A.S., Song R., Hall I. State-level estimates of HIV incidence, prevalence, and undiagnosed infections. February 2017. Poster presented at the annual Conference on Retrovirus Infection, Seattle, WA.



***State of diagnosis***

About three out of four (72%) PLWH in Wisconsin received their first verifiable HIV diagnosis in Wisconsin; 28% received their initial HIV diagnosis in another state or country and subsequently moved to Wisconsin. Of the 1,973 individuals diagnosed outside of Wisconsin, more than half were from one of the five following locations: Illinois (477), California (160), Minnesota (143), Florida (136), and foreign countries (123) (Figure 26).

**Figure 26: Number of people living with HIV in Wisconsin by state of diagnosis, 2017**

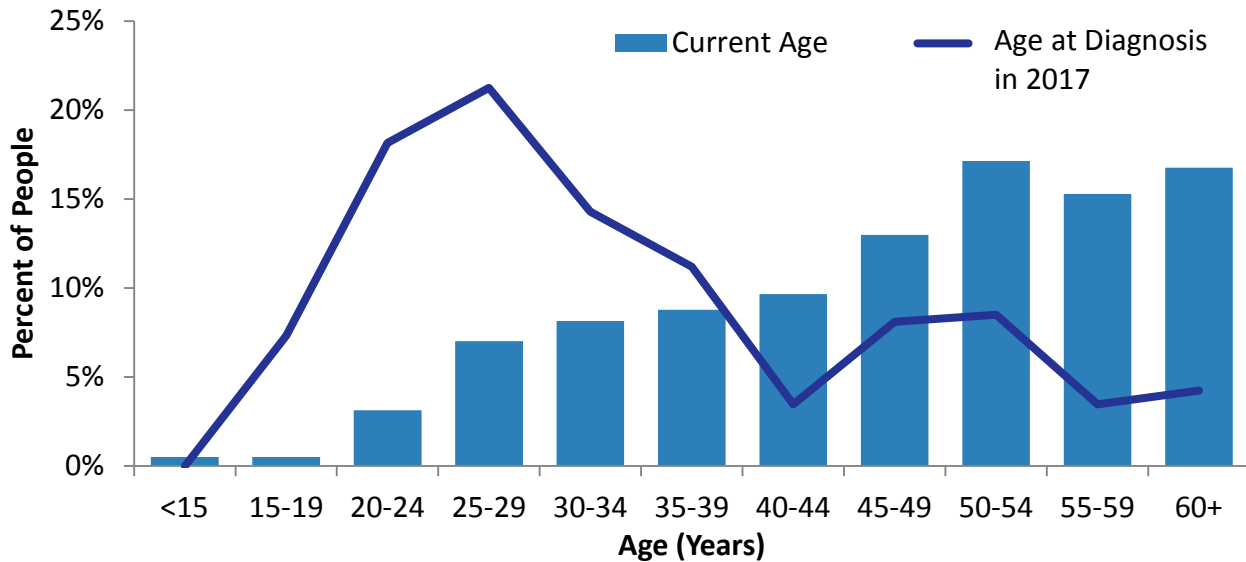


**Age**

Of Wisconsin’s known total PLWH, 11% are under age 30, 89% are ages 30 and older, and the median age is 49 years (Figure 27). By contrast, among 2017 diagnoses, 61% were under age 30 and 39% were ages 30 and older.

Thus, services for PLWH need to address health conditions of aging in addition to HIV, while prevention efforts need to target the younger age groups.

**Figure 27: People living with HIV by current age as of December 31, 2017, and people diagnosed during 2017 by age at diagnosis, Wisconsin**



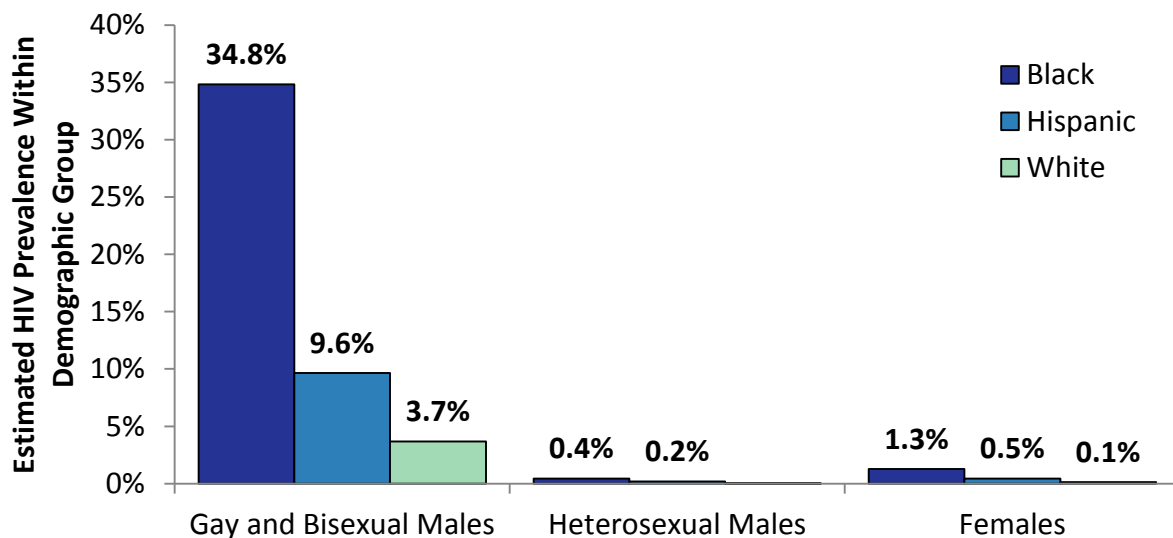
**Estimated prevalence by demographic group**

Disparities in HIV prevalence occur both *between* demographic groups and by race/ethnicity *within* each demographic group (Figure 28). One in three (35%) Black gay or bisexual men ages 15-59 is estimated<sup>5</sup> to be living with HIV in Wisconsin compared to 10% of Hispanic and 4% of White gay and bisexual men.

Fewer than 1 in 1,000 females and heterosexual males in Wisconsin are living with HIV. Among heterosexual males and females, the estimated HIV prevalence is highest among Black individuals (0.4% of males and 1.3% of females). Other races were excluded from this analysis due to small numbers.

The HIV prevalence estimates presented below may vary from estimates reported in previous years due to a change in age range and updated estimates of the proportion of individuals living with undiagnosed HIV.

**Figure 28: Estimated prevalence of HIV in selected demographic groups, ages 15-59, Wisconsin, 2017**



<sup>5</sup> Estimates generated from surveillance data and state-specific estimates of the number of men who have sexual contact with men in: Lieb S., *et al.* Statewide estimation of populations of gay and bisexual men in the United States. *Public Health Reports* 2011;126(1):60-72 and CDC’s estimate that overall 15% of people living with HIV are unaware of their status, with variations by race/ethnicity. See Technical Notes for additional information.



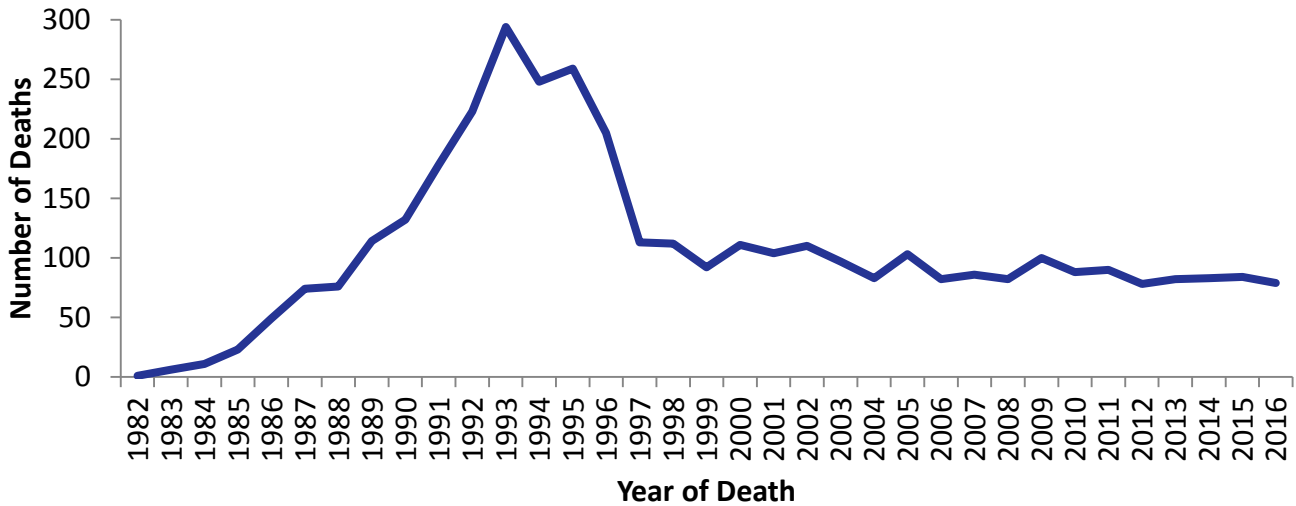




## DEATHS

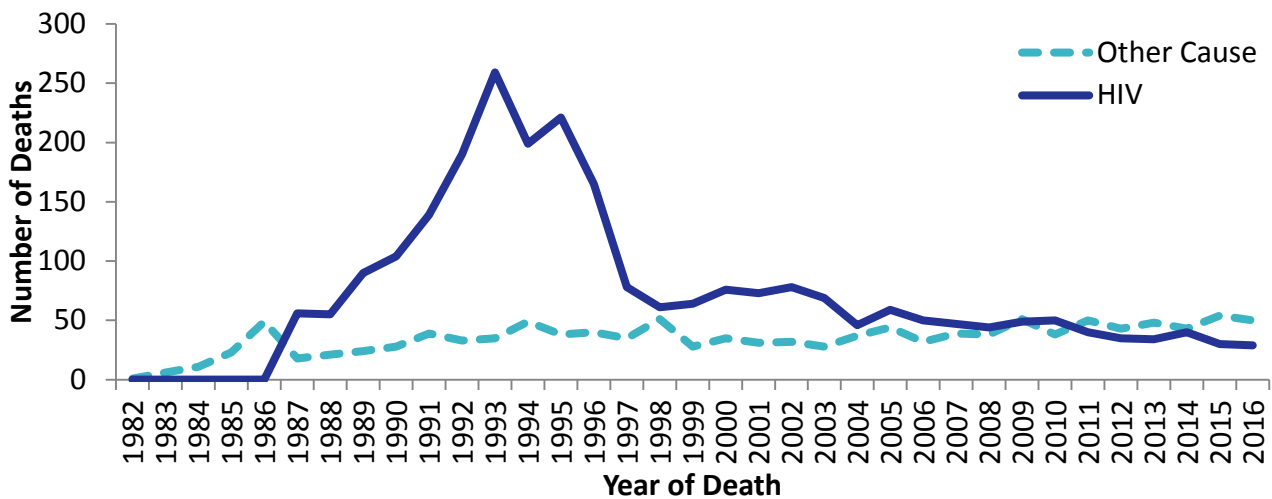
Deaths due to any cause among PLWH in Wisconsin have declined since the early-to-mid-1990s. During 2016 (the most recent year for which complete death data are available), 79 deaths occurred in Wisconsin among people living with HIV (Figure 30). Over time, there have been 91 deaths where state of death was unknown and these deaths are, therefore, excluded from the graphics that follow.

**Figure 30: Number of deaths due to any cause among people living with HIV in Wisconsin, 1982-2016**



During 2016, 29 of the 79 reported deaths had HIV listed as the cause of death, while 50 deaths were attributed to another cause (Figure 31).

**Figure 31: Number of deaths,<sup>†</sup> by cause of death, among people living with HIV in Wisconsin, 1982-2017**

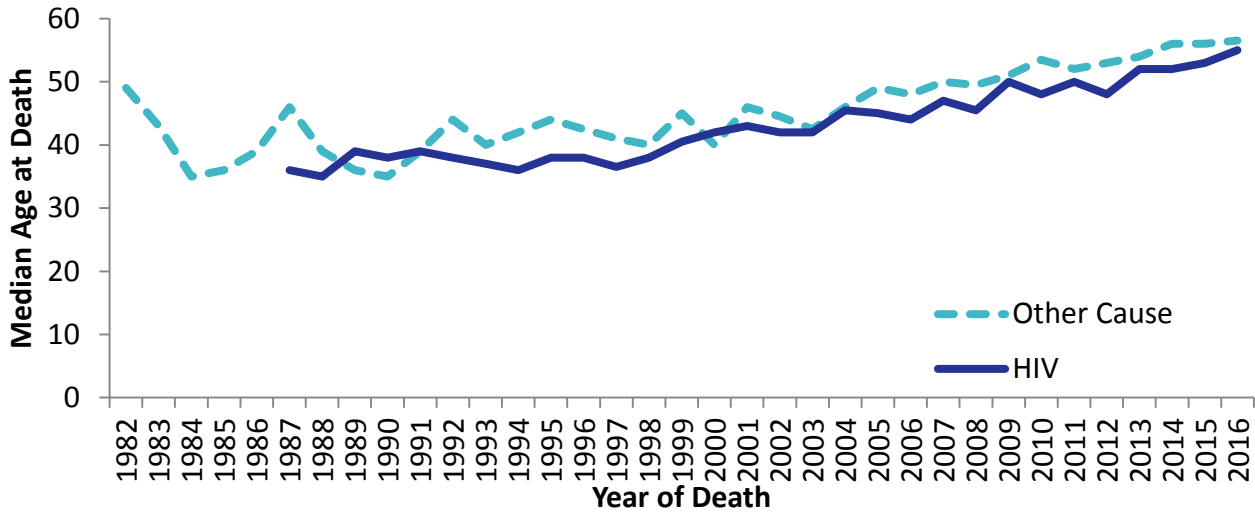


<sup>†</sup>Excludes 78 individuals with an unknown cause of death.



The median age at death of PLWH who died in Wisconsin has increased steadily, both for those with and without HIV listed as the cause of death (Figure 32). The median age at death among individuals whose death was attributed to HIV (age 55) has generally been younger than those who died from other causes (age 56.5).

**Figure 32: Median age at death, by cause of death,<sup>†</sup> among people living with HIV in Wisconsin, 1982-2016**



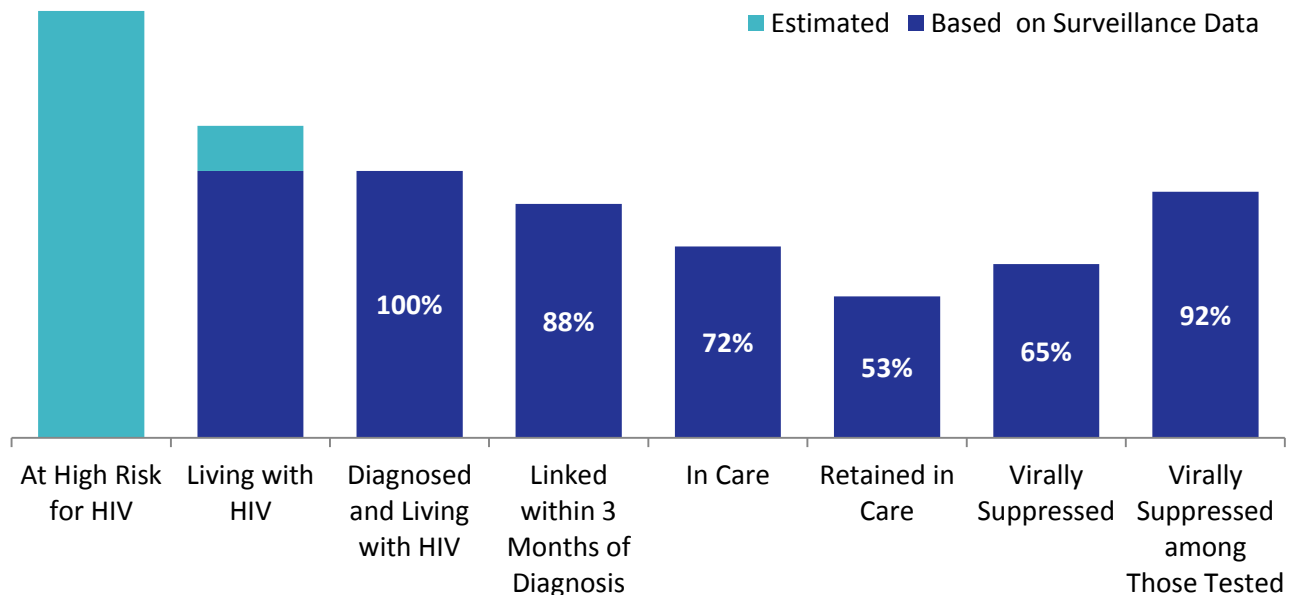
<sup>†</sup>Excludes 78 individuals with an unknown cause of death.



## 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 33 depicts timely linkage among individuals diagnosed with HIV in Wisconsin during 2017 and care patterns during 2017 among people living with HIV at the end of 2016.

**Figure 33: HIV care continuum†, Wisconsin, 2017**



†Reflects laboratory data received through February 28, 2018.

### **Estimated Data**

**At High Risk for HIV:** People at higher risk for HIV include those with factors such as condomless male-to-male sex without 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.

**Living with HIV:** CDC estimates that 15% of individuals living with HIV in the U.S. are unaware of their status. This bar shows both those aware and diagnosed and those unaware of their HIV.

### **Based on Surveillance Data**

**Diagnosed and Living with HIV:** All individuals reported with HIV in Wisconsin by the end of 2016 who were still alive and living in Wisconsin by the end of 2017 (n=6,592).

**Linked within Three Months of Diagnosis:** Of individuals diagnosed with HIV in Wisconsin during 2017, 88% were linked to care within three months of diagnosis. Three out of four newly



diagnosed individuals were linked to care within the one month target described in the most recent National HIV/AIDS Strategy<sup>6</sup>.

**In Care:** Of individuals diagnosed and living with HIV in Wisconsin, 72% had at least one medical visit, using laboratory data as a proxy for medical care, during 2017.

**Retained in Care:** Of individuals diagnosed and living with HIV in Wisconsin, 53% were retained in care, based on laboratory data as a proxy for medical care. 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.

**Virally Suppressed:** Of individuals living with HIV in Wisconsin, 65% were virally suppressed at their last viral load test during 2017. 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:** Of individuals who had a viral load test during 2017, 92% were suppressed at their last measurement. This suggests that most individuals receiving some medical care are achieving viral suppression. Viral suppression not only improves the health of the person living with HIV but also prevents them from transmitting HIV sexually to partners.

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<sup>6</sup> Office of National AIDS Policy. National HIV/AIDS Strategy for the United States: Updated to 2020. (2015). Available at <https://files.hiv.gov/s3fs-public/nhas-update.pdf>.



### HIV-STI CO-INFECTIONS

Identifying sexually transmitted infections (STI) among people living with HIV is important for:

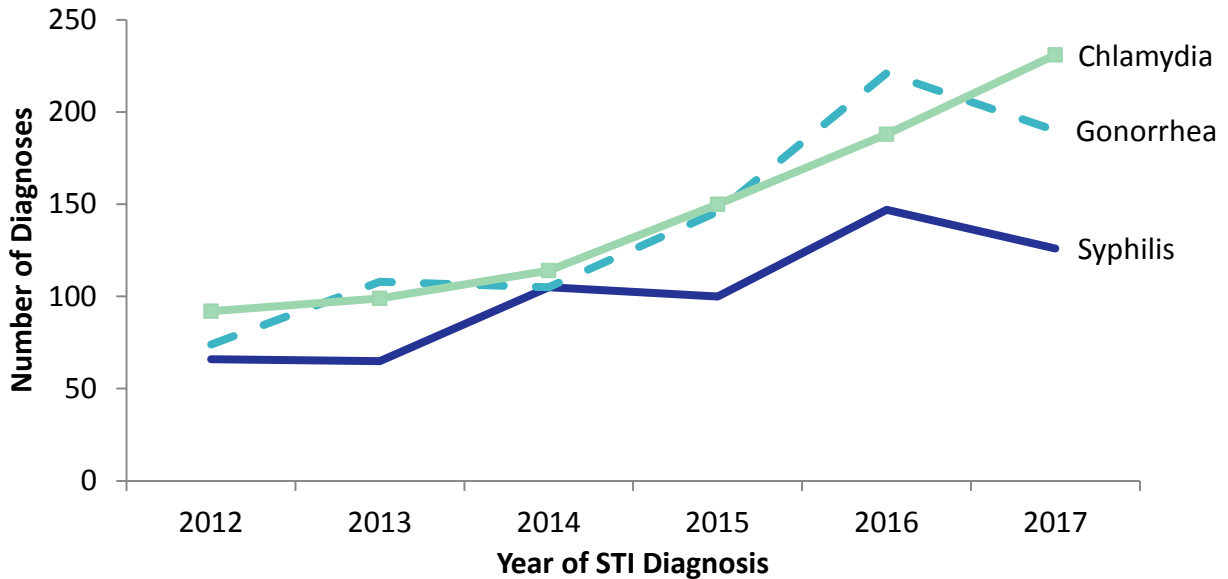
- Providing treatment for the STI.
- Identifying undiagnosed HIV.
- Testing named partners for HIV in addition to STIs.
- Offering eligible partners pre-exposure prophylaxis (PrEP) for preventing HIV.
- Re-linking out-of-care individuals back into HIV care.

During 2017 there were 547 diagnoses of an STI among individuals living with HIV (individuals may be duplicated if they had more than one STI diagnosis during the year). There were:

- 126 syphilis diagnoses.
- 190 gonorrhea diagnoses.
- 231 chlamydia diagnoses.

STI diagnoses among people living with HIV have increased since 2012, as they have in the general population (Figure 34). Syphilis diagnoses among PLWH have almost doubled, while gonorrhea and chlamydia diagnoses have more than doubled.

**Figure 34: Sexually transmitted infections among people living with HIV, by year of STI diagnosis, Wisconsin, 2012-2017†**



† Sexually transmitted infection data are from the Wisconsin Electronic Disease Surveillance System. This analysis may be missing disease incidents from 2017 that have not yet been finalized in the STI surveillance database.



## 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>7</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 HIV Program and is based primarily on HIV surveillance data collected by 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 reports 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 (that is, 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.

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.

<sup>7</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.



### Estimated Prevalence of HIV

The estimated 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 persons 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. 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.
- Heterosexual contact includes persons who have ever had heterosexual contact with a person known to have, or to be at high risk for, HIV (for example, 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.

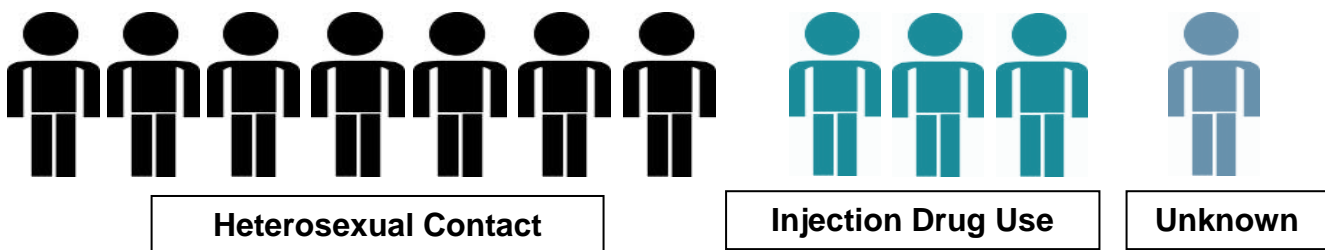
- The category "Other" is used to group less common transmission categories, including people with hemophilia, people who were exposed to HIV through a blood transfusion or tissue/organ transplant, and other pediatric transmission categories.
- Perinatal transmission refers to HIV transmitted during 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 persons 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 (for example, 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**

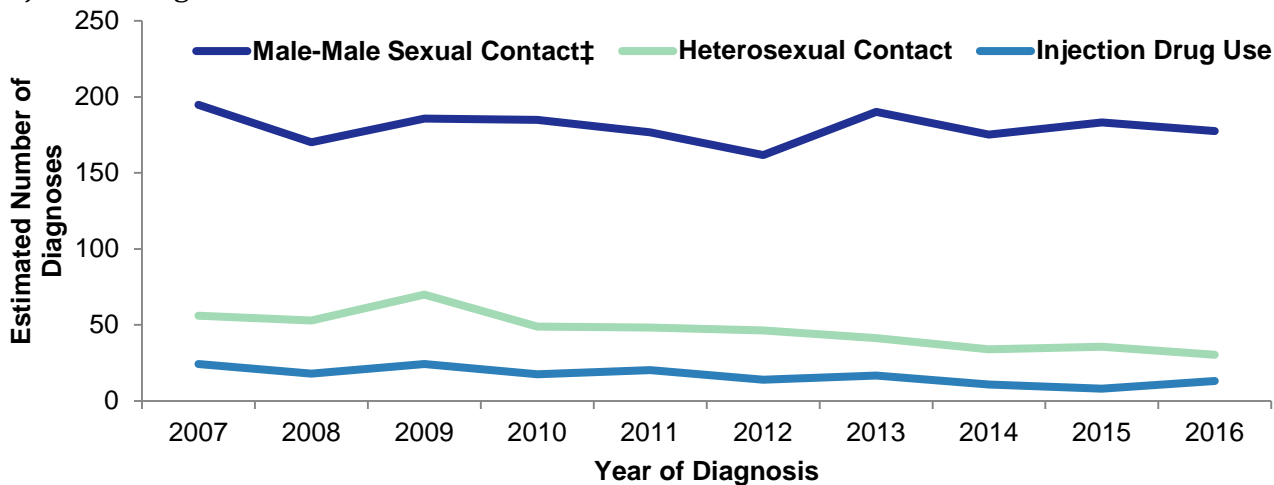
- In this report, rates are defined as number of people per 100,000 population, except where noted. Population denominators used to calculate rates are from the Wisconsin Interactive Statistics on Health website (<https://www.dhs.wisconsin.gov/wish/index.htm>).
- Rates published by the CDC for Wisconsin,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

### 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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