HIV Prevalence December 31, 2019

Data as of July 2020

The HIV Prevalence Report includes diagnosed persons living with HIV (PLWH) in Michigan. This slide set highlights key observations related to HIV prevalence and transmission and is meant to guide care and prevention strategies. To view the tables used to create this slide set, Stage 3 data, HIV transmission rate information, STD diagnoses among prevalent persons, and other geographic and demographic breakdowns, please see the HIV Prevalence Report Tables.

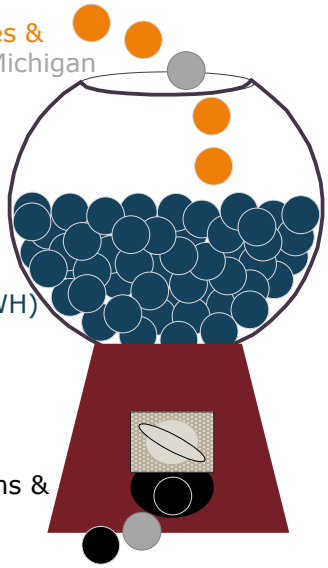
For care-related assessments (estimated undiagnosed, care, viral suppression, and maintained undetectable), see the Continuum of Care Report. For Linkage-related assessments see the Trends Report.

All reports may be found on the website: https://www.michigan.gov/mdhhs/0,5885,7-339-71550_2955_2982-428731--,00.html

For a copy of the slide set, email: MDHHS-DHSP-TAandData-Requests@michigan.gov.

Key Definitions & History

Key Definitions: New diagnoses & Prevalence

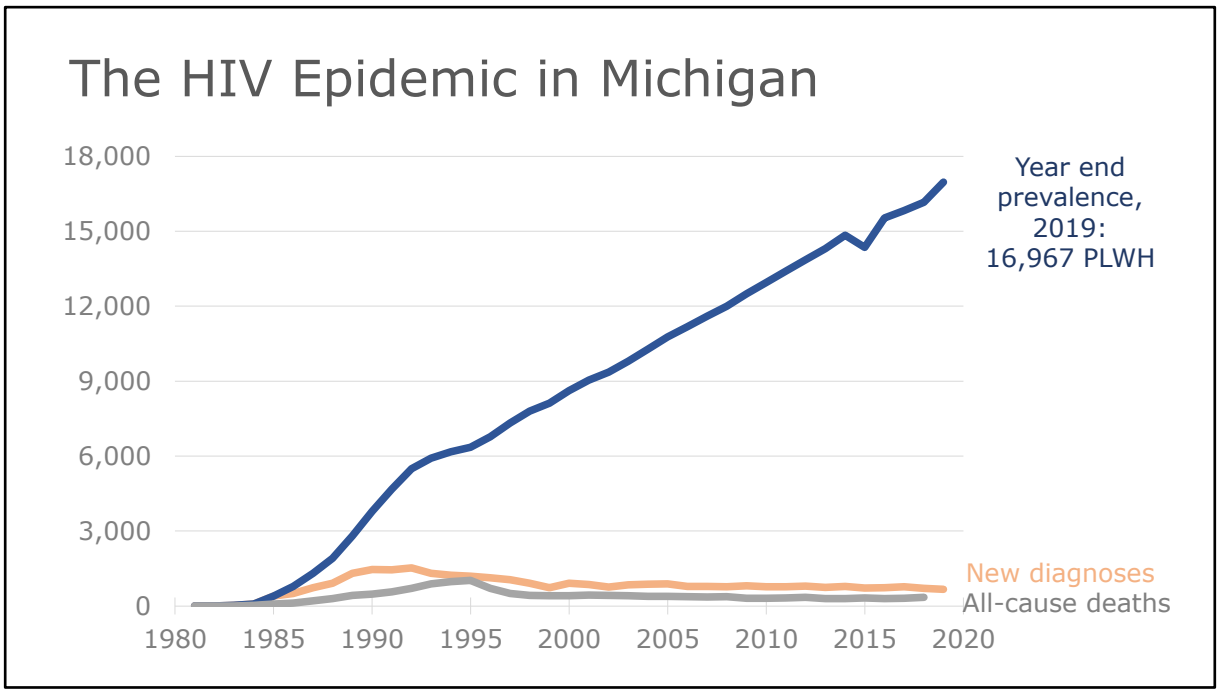


In Michigan, prevalence continues to increase because the number of new diagnoses is larger than the number of deaths.

For further clarification, check out the notes section of this slide set

New Diagnoses: The number of cases newly diagnosed over a given period of time, usually a year. In HIV surveillance, new diagnoses do not necessarily represent new infections as newly diagnosed persons may have been infected for many years.

Prevalence: The total number of persons currently living with HIV (PLWH).



In Michigan, prevalence continues to increase because the number of new diagnoses is larger than the number of deaths. Before 2014, prevalence counts were calculated by adding new diagnoses to the previous year's prevalence and subtracting total deaths. This method ignores movement. Historically (pre-1998), movement was minimal as most PLWH did not survive long after diagnosis. Therefore, residence at diagnosis was the focus. Beginning in 2014, efforts to update current address began, and prevalence counts switched from calculations based on residence at diagnosis to current address. All the movement among PLWH that occurred up until that point was included in the prevalence count in 2015. That is why there is a dip in 2015.

Key Definitions: Population rate

A rate is a count compared to an underlying population (usually per 100,000). By presenting data as a rate (rather than a count), comparisons may be made across various geographic and demographic groups.

Prevalence rate: For every 100,000 people in a population, the number living with HIV.

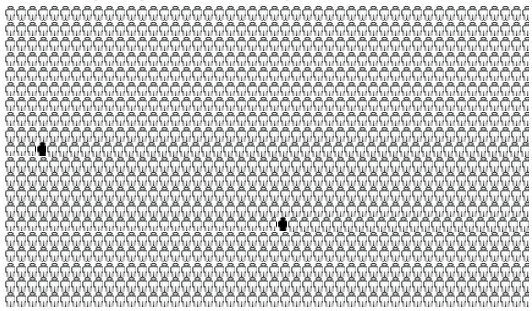
New diagnosis rates are calculated the same way: For every 100,000 people in a population, the number of new HIV diagnoses during a given year.

The importance of assessing rates is explored in a subsequent slide. For now, here is the calculation for Michigan's HIV prevalence rate:

- There are 9,986,857 people living in Michigan. 16,937 of them are HIV positive.
- $\frac{16,937}{9,986,857} = 0.001699$
- That means for every 1 Michigan resident, 0.001699 have HIV – obviously, this does not make any practical sense, so population rates are generally calculated per 100,000 residents:
- 0.001699 x 100,000 = 169.9 which means for every 100,000 Michigan residents 169.9 (or 170) are living with HIV.

What does this actually look like at a population level?

1,000 people in Michigan



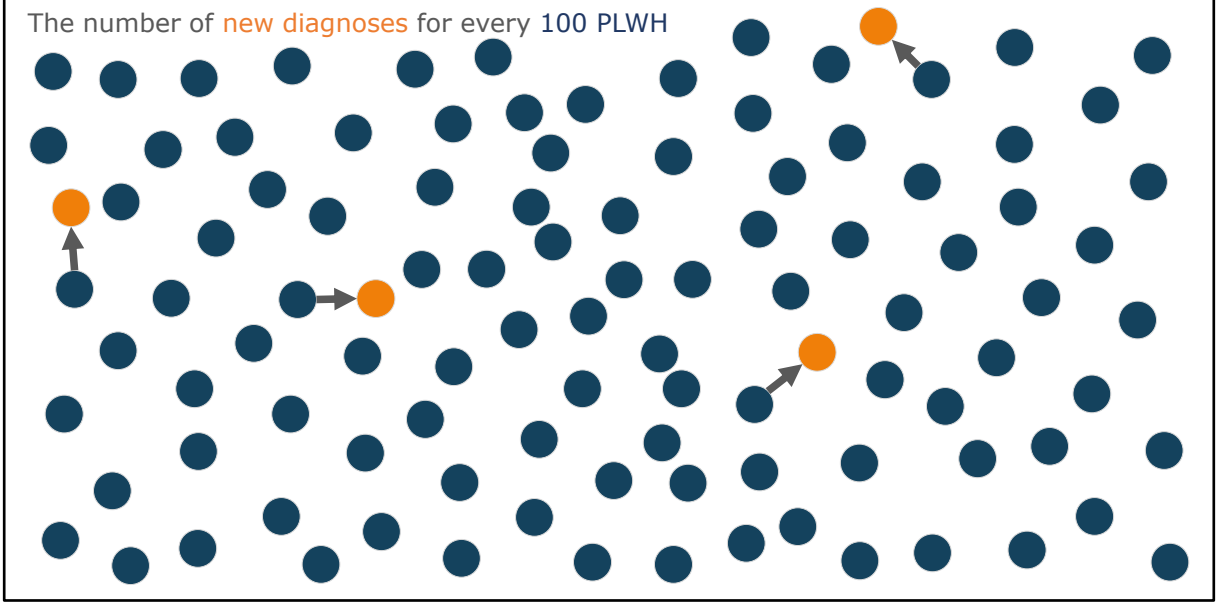
Living with HIV HIV negative

What does "per 100,000" really look like? If 100,000 people icons were included on this slide, it'd be impossible to differentiate between those living with HIV and those who are HIV negative (imagine each of the blocks of men above copy and pasted 100 times). For visual purposes, the prevalence rate here is scaled back to per 1,000 population level and rounded.

This is what the HIV prevalence rate in Michigan looks like.

Key Definitions: HIV Transmission Rate (HTR)

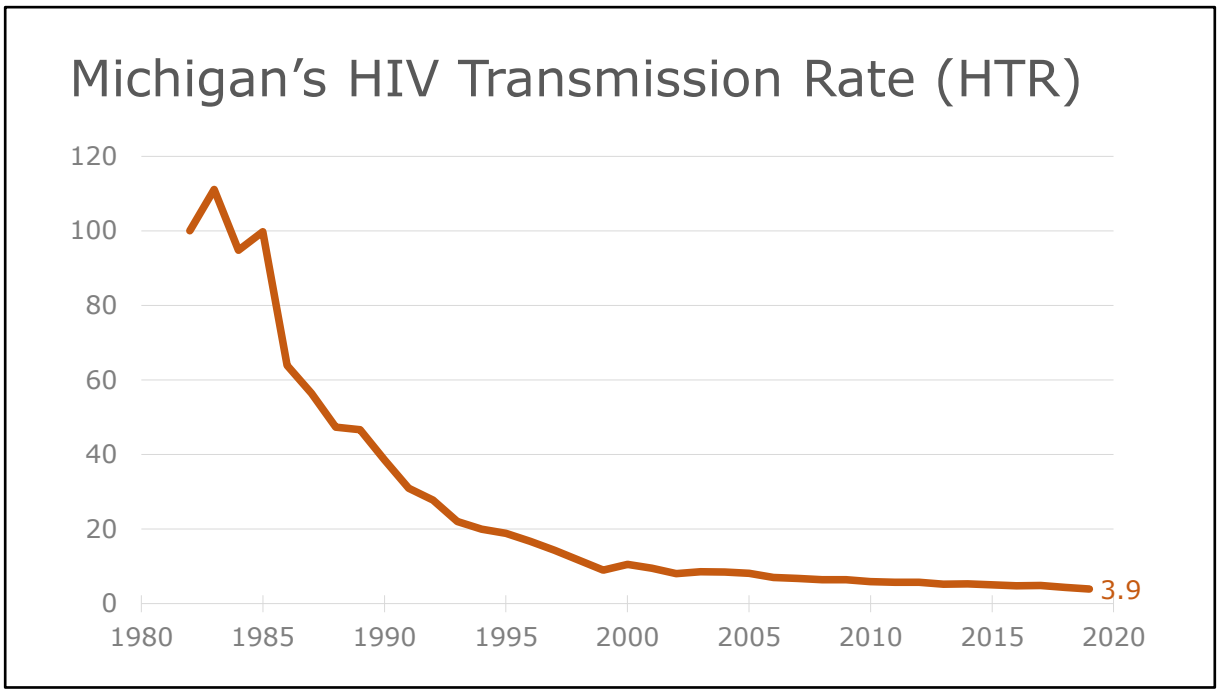
The number of new diagnoses for every 100 PLWH



The HTR assesses the number of new diagnoses for every 100 PLWH (new diagnoses/PLWH x 100). In Michigan during 2019, there were 665 new diagnoses and 16,967 PLWH. Michigan's HTR is 665/16,967 x 100 = 3.9.
Michigan's HTR is represented on this slide. The 100 blue circles represent 100 PLWH, and the four orange circles represent 4 new diagnoses.

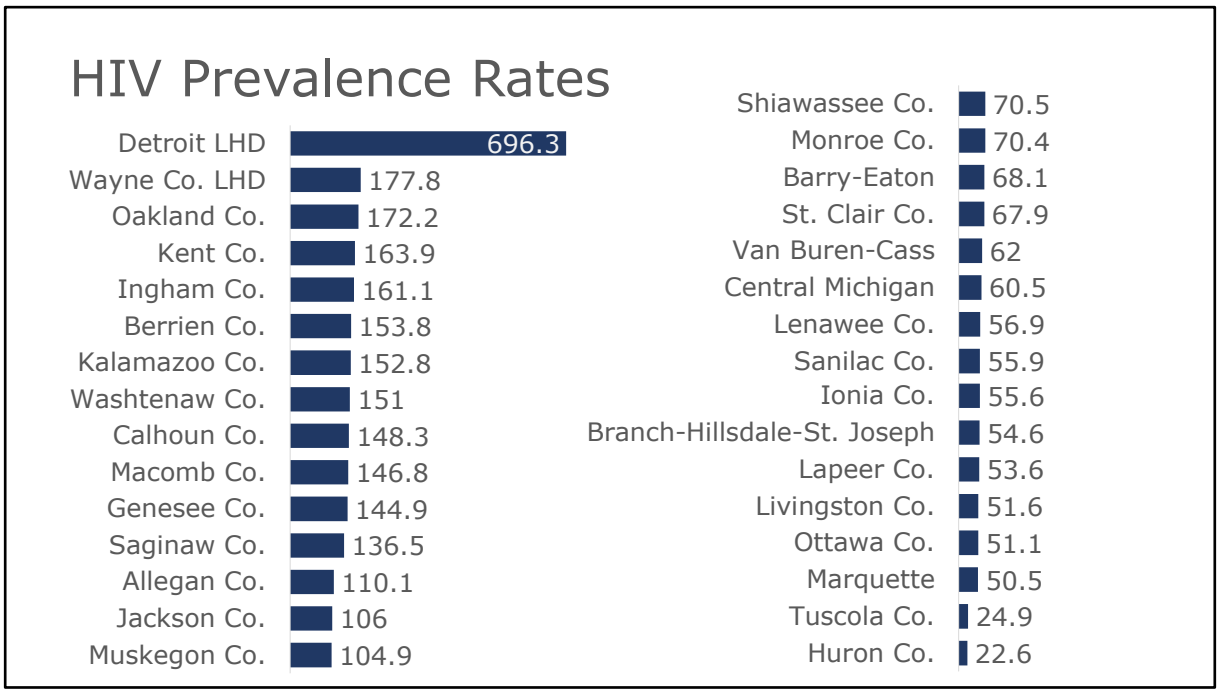
The HTR is useful for two main reasons:

1) It may help identify which communities have higher or lower new diagnosis rates than expected. Everything held equal (risk behavior, care access, etc.) HTR's would be the same in every community, every year (the number of new diagnoses would only be affected by the number of PLWH). Communities with high prevalence rates would have high new diagnosis rates solely because individuals in that community are more likely to encounter someone living with HIV and vice versa. However, other factors such as risk behavior, testing, and care access are not equal and affect transmission and new diagnosis rates. High HTR's are an indication of differing underlying factors in a community – is there a large number of undiagnosed individuals, did care access change, was there a testing event, etc..?
2) A decreasing HTR means transmissions are decreasing. New diagnosis trends don't always reflect this important measure.



The HTR continues to decrease in Michigan.

Geographic Distribution



Detroit LHD includes the cities of Detroit, Hamtramck, Harper Woods, Highland Park, & the Grosse Pointes.
Wayne Co. LHD includes residents of Wayne Co. outside the Detroit LHD Jurisdiction
Central Michigan includes all otherwise unlisted counties in the lower peninsula.
Marquette includes the entire upper peninsula.

Demographic Distribution

Why rates are important

At the end of 2019, there were **7,017** Black/AA men and **5,062** white men living with HIV in Michigan. For every 2 white men living with HIV, there are 3 Black/AA men.

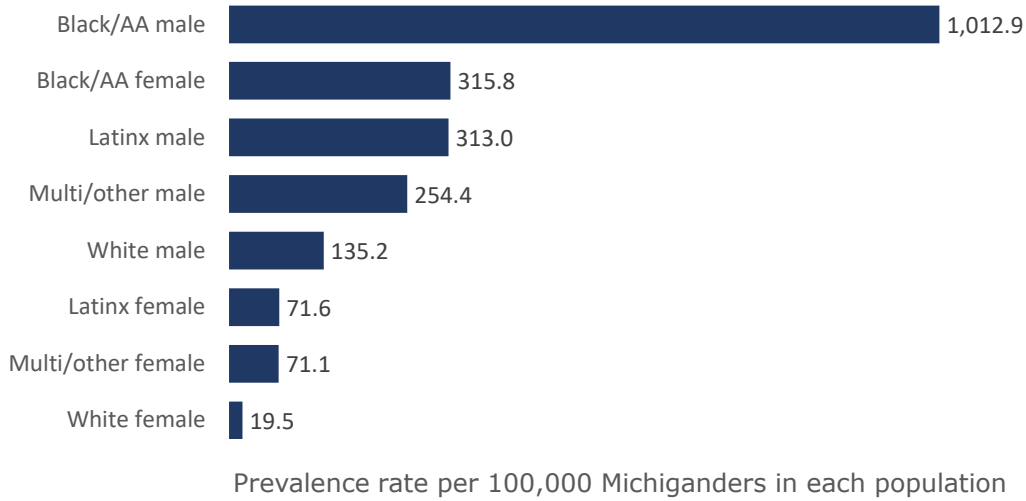
The count among Black/AA men is higher, but it's not *that* much higher.

To understand disparities, we must take into account the entire population – i.e. calculate a prevalence rate.

The HIV **prevalence rate** per 100,000 Black/AA men in Michigan is **1,012.9** and **135.2** per 100,000 white men. For every 2 white men living with HIV per 100,000, there are 15 Black/AA men – a very large disparity.

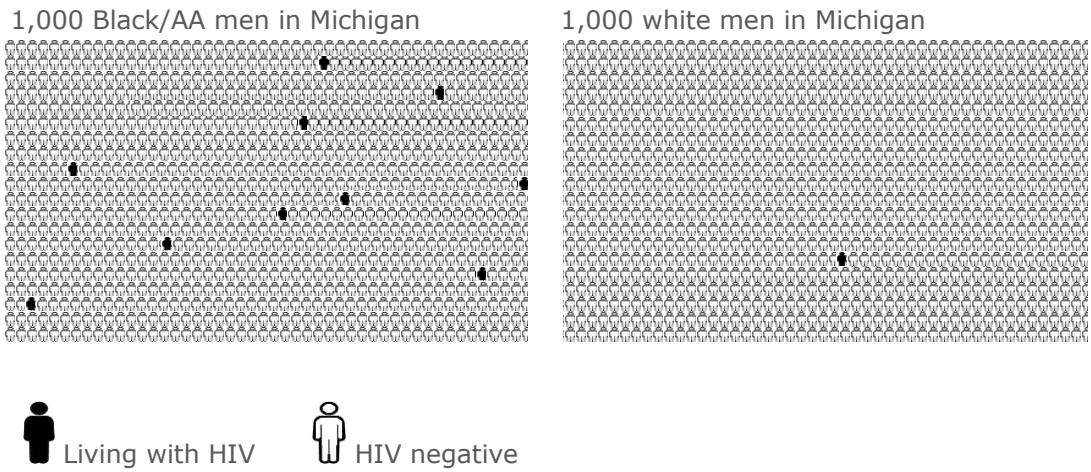
For more detail on rates, please see our 5-minute Epidemiology 101 video

Persons of color, especially Black/AA men, are most affected by HIV



In Michigan, Black/AA men carry the burden of a generalized epidemic, meaning over 1% of Black/AA men in Michigan are living with HIV.

What does this actually look like at a population level?

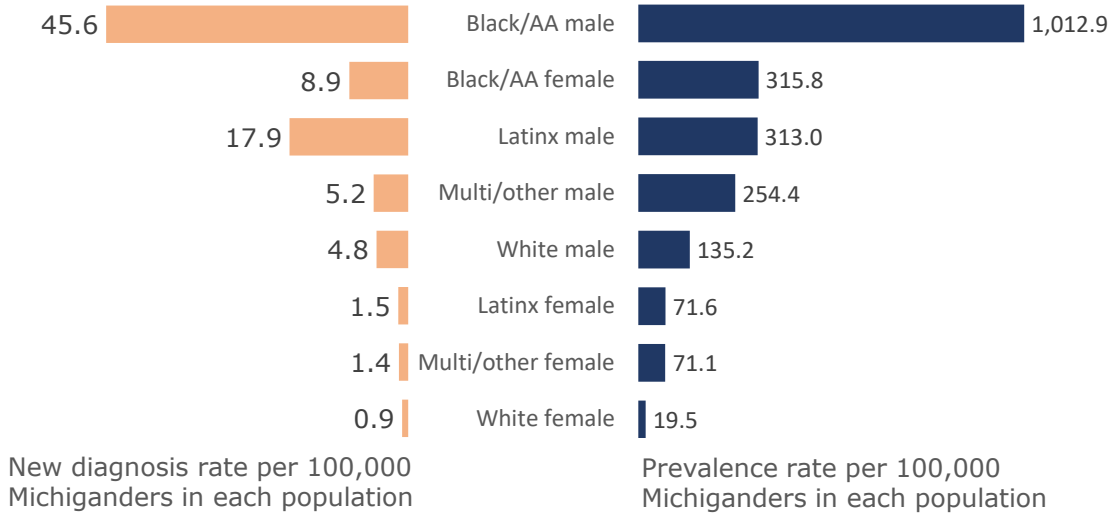


What does "per 100,000" really look like? If 100,000 people icons were included on this slide, it'd be impossible to differentiate between those living with HIV and those who are HIV negative (imagine each of the blocks of men above copy and pasted 100 times). For visual purposes, the prevalence rate here is scaled back to per 1,000 population level and rounded.

This is what the HIV Prevalence rate in Michigan looks like for Black/AA men and white men.

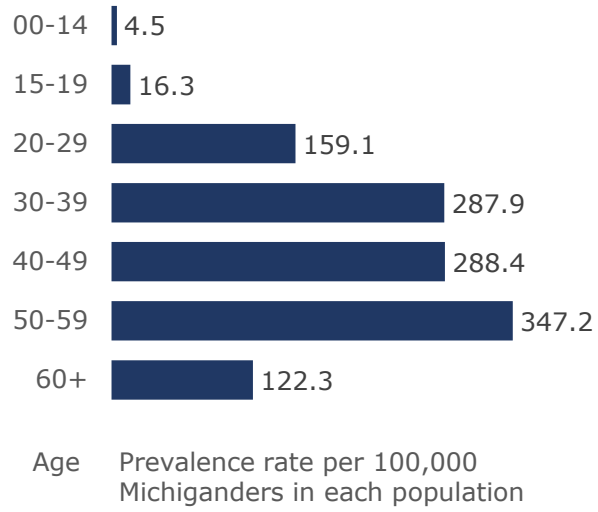
Visually it is clear the Black/AA male population is much more affected than the white male population. Immediately we can assume two things: 1) More care resources are needed in the Black/AA community, and 2) all other aspects held equal (risk behavior, care access, etc.), persons in the Black/AA community are more likely to contract HIV solely because they are more likely to encounter someone living with it. Therefore, more prevention resources are also needed in this community. Note: all other aspects, such as care access, are *not* equal.

Groups with high prevalence rates often experience high HIV diagnosis rates as well

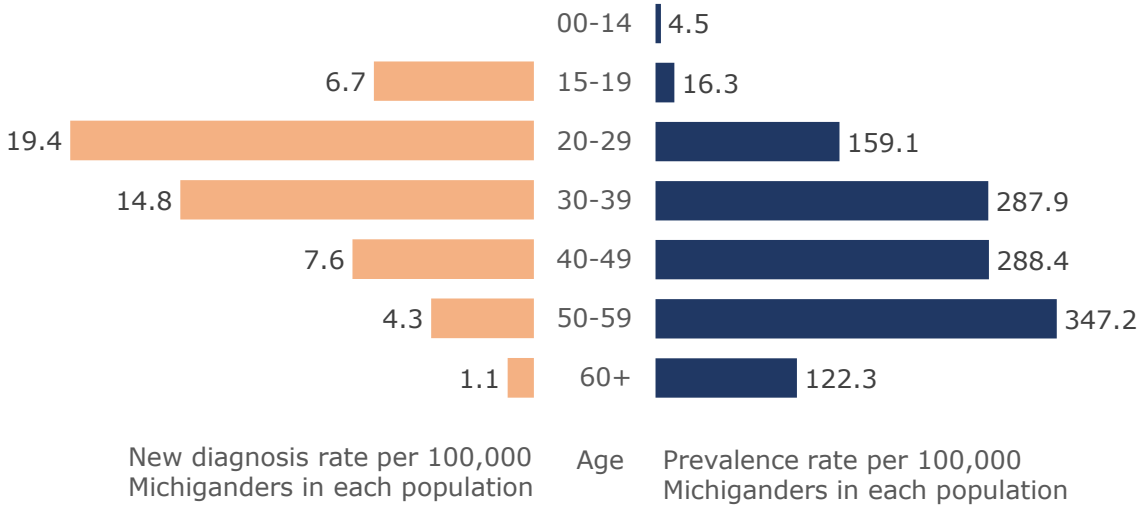


With few exceptions, prevalence rates and new diagnosis rates are correlated. As discussed, persons in communities with high prevalence rates are more likely to contract HIV solely because there is more of it in the community.

Prevalence rates are highest for persons 30-59 years old…



…but new diagnoses are highest for persons 20-39.

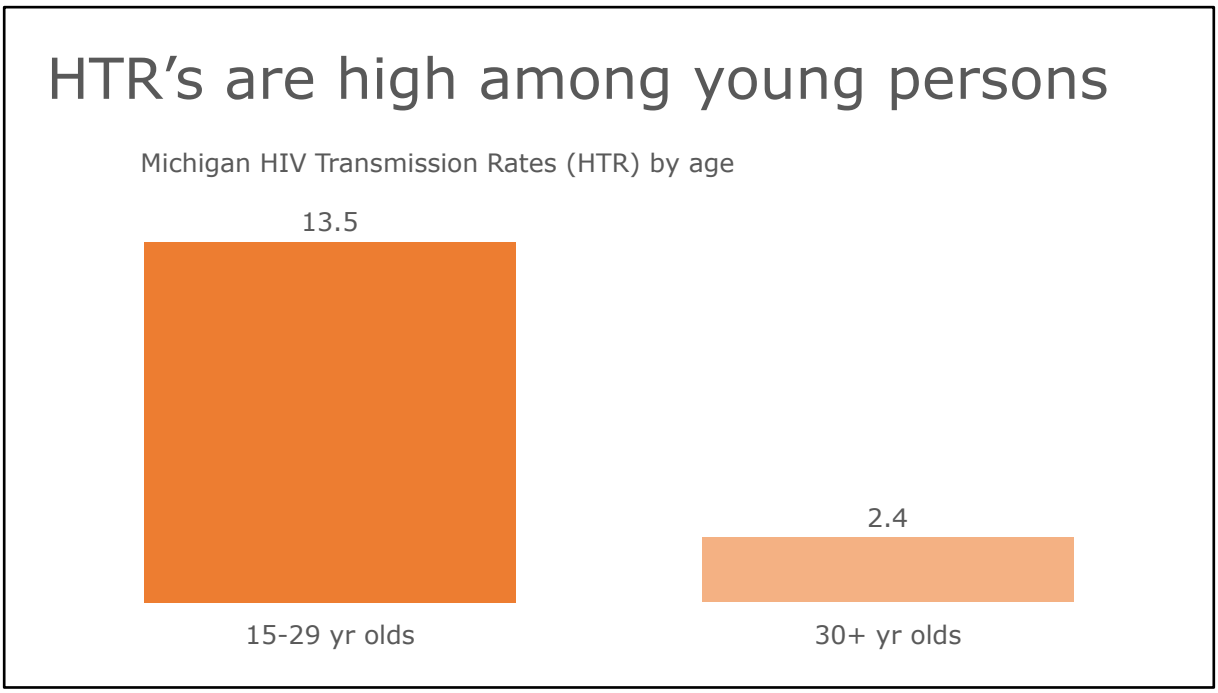


Groups with high prevalence rates tend to also have the highest new diagnosis rates because individuals in that group are more likely to encounter PLWH. However, an exception to this pattern occurs when broken down by age group. Younger persons are more at risk for new HIV infection despite having lower prevalence rates. A major measurable factor is the difference in community level viral suppression. When an individual maintains and monitors a suppressed viral load, they cannot transmit HIV sexually. When a large proportion of a community is virally suppressed, the transmission rate of the entire community drops. The older the age group, the higher the community viral suppression, and the lower the transmission and new diagnosis rates (see Continuum of Care report for numbers and charts related to viral suppression).

Additionally, prevalence rates are larger for older populations simply because they've been alive longer. They've had more years of potential risk compared to the younger populations.

Note: During 2019, there were zero new diagnoses among Michiganders under 15 years old.

HTR's are high among young persons



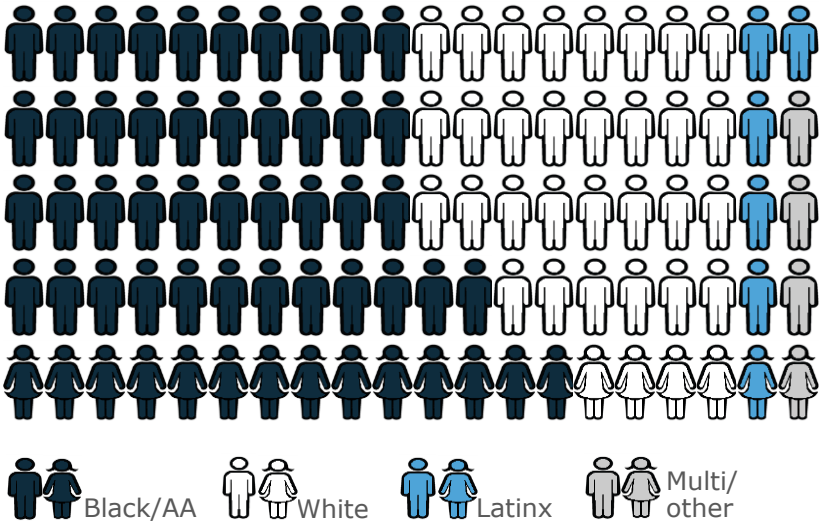
The high new diagnosis rate among young persons given their prevalence rate is demonstrated in the HIV Transmission Rate (HTR). As discussed, this is likely due to differences in behavior and viral suppression rates. If the HIV Transmission Rate (HTR) of those 15-29 matched the HTR of persons 30 years and older, it would result in a reduction of new diagnoses by 38%.

Of all 15-29 year olds living with and newly diagnosed with HIV, 60% are among Black/AA men. This is why care and prevention activities must remain focused on the young Black/AA male population.

Note: Analyses of HIV strains among persons diagnosed in Michigan show transmissions occur within demographic groups. For example, the vast majority of new infections among young persons are from other young persons, not older populations. This further validates the high transmission rate observed in the younger age group.

Of PLWH in Michigan…

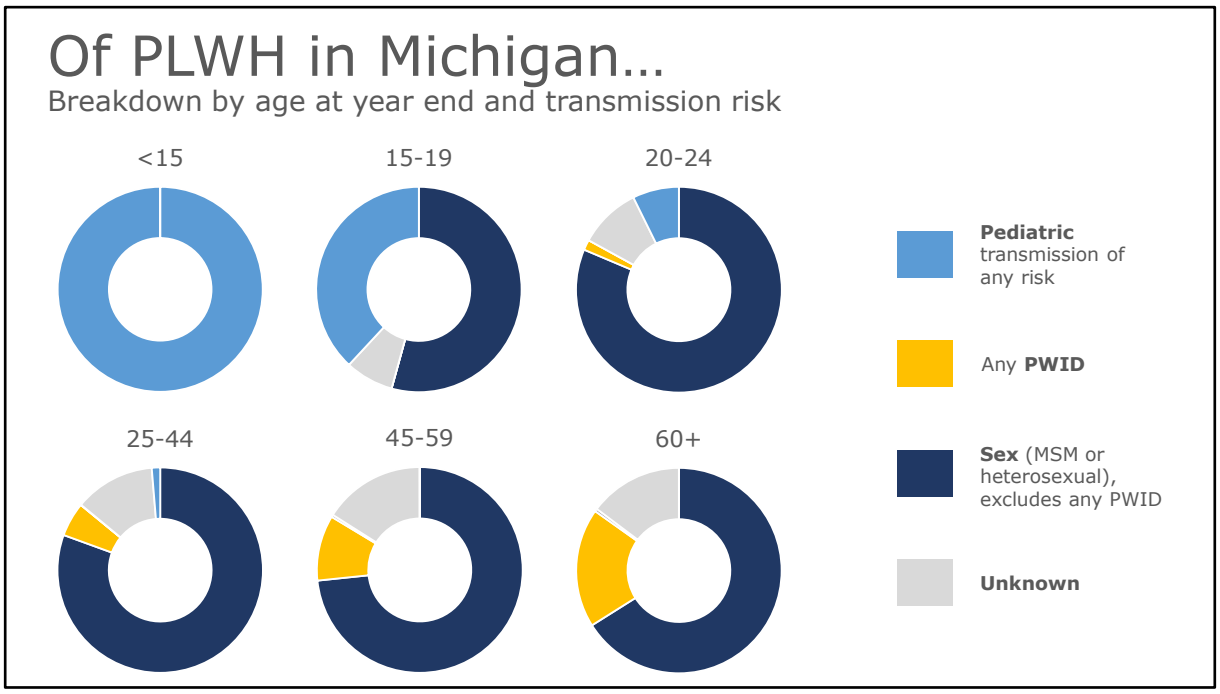
Breakdown by sex and race/ethnicity



The proportion of PLWH who identify as transgender (1.4%) is likely underreported. Based on new diagnoses, 2.4% or more identify as transgender.

Prevalence rates better portray disparities among various populations; however, it is sometimes helpful to view the population proportions of persons living with HIV.

To understand the burden faced by the Transgender community, it is more helpful to compare new diagnoses rather than prevalence. The primary data source did not capture gender identity until 2010. Therefore, gender identity is underreported among persons diagnosed before 2010. In 2019, 2.4% of persons newly diagnosed with HIV identified as transgender.



Transmission risk assessments are most useful when assessing new diagnoses as risk behavior is episodic[1]. However, aggregated risk groups are correlated with age and care needs (see Continuum of Care Report). One can imagine persons who have lived with HIV their entire lives (pediatric cases) will have different needs compared to persons who acquired HIV through injection drug use and are in their 50's.

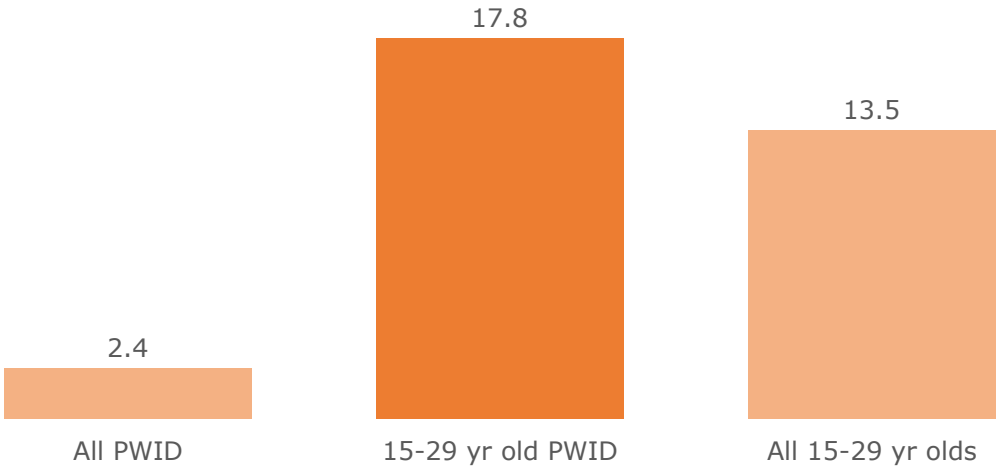
Note: the age groups displayed are based on natural breaks in risk proportion.

All PLWH under 15 years old were infected perinatally (at birth) or before 12 years of age by some other transmission risk. A large portion of teens 15-19 years old are also pediatric cases. Non-perinatal pediatric cases are usually among foreign born children infected in their country of origin where risk cannot be confirmed. The proportion of PLWH who injected drugs increases substantially with age.

[1]Zhang X, Zhong L, Romero-Severson E, Alam SJ, Henry C, et al. (2012) Episodic HIV Risk Behavior Can Greatly Amplify HIV Prevalence and the Fraction of Transmissions from Acute HIV Infection Statistical Communications in Infectious Disease vol 4:1

Extremely high HTR for Young PWID's

Michigan HIV Transmission Rates (HTR) by age and risk



On this slide, PWID includes PWID alone and PWID/MSM.

Though the proportion of PLWH who inject drugs increases with age, transmissions among PWID is mainly occurring within young populations. The transmission rate is extremely high among 15-29 yr old PWID. Compared to all PWID's, the transmission rate is 7.5 times higher for young PWID, and compared to youth in general (who already have a very high HTR compared to older persons) young PWID's have a 30% higher rate of transmissions. Young PWID are very closely monitored as this group is prone to an HIV outbreak, and resources are in place to prevent further increases in transmissions.

When underlying population counts are unknown (such as with PWID), the HTR is the only measure standardized for comparison with other groups.

Prevalence Summary

- The Detroit area (Wayne Co. in and outside Detroit, and Oakland Co.) have the highest HIV prevalence rates in the state.
- The population of PLWH is aging, but young people – especially young Black/AA men have the highest transmission rates.
- It is critical to continue prevention efforts among young PWID.