



ANNUAL REVIEW OF HIV TRENDS IN MICHIGAN (2010 - 2014)

Michigan Department of Health & Human Services

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HIV, Body Art, STD, and Viral Hepatitis Section, April 2016

Overall trends in new Michigan HIV diagnoses

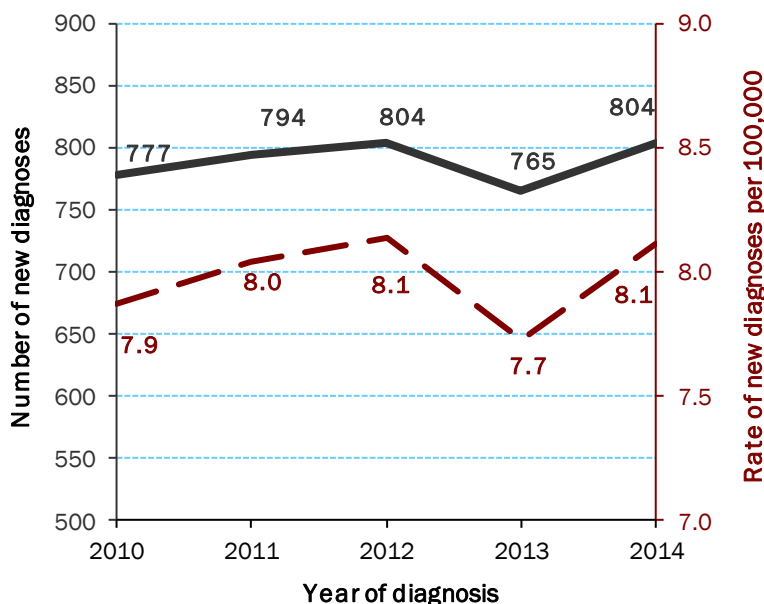
METHODS. To evaluate trends in new HIV diagnoses in Michigan over time, we estimated the number of persons newly diagnosed with HIV infection between 2010 and 2014 by adjusting the number of reported cases to account for those who may not have been reported to the health department by January 1, 2016. These adjustments were made by weighting the data.

Unless otherwise noted, numbers cited include persons living with all stages of HIV infection*. We used regression modeling on the adjusted data to assess significant changes in annual rates of new diagnoses overall and by race, sex, and age. Rates for race and sex subgroups were calculated using annual population estimates released by the Census Bureau in 2015. Rates for age at diagnosis were calculated using the 2014 Bridged-Race Population Estimates produced by the Population Estimates Program of the U.S. Census Bureau in collaboration with the National Center for Health Statistics. For risk groups, we analyzed annual counts since there are no reliable denominator data available for rate calculation. Trends overall and in subgroups are described using *average annual percent changes* in rates (or counts) of new diagnoses. Only significant trends and their corresponding percent changes are shown. "Significant" indicates statistical significance assessed at $p < 0.05$.

For concurrent diagnoses, defined as progression to stage 3 HIV infection within 30 days of HIV diagnosis, we used the Chi Square Mantel-Haenszel test for trend to assess changes over time. This test allows us to assess increases and decreases in the *proportion* of new diagnoses that are concurrent for a particular race/sex combination.

The date of new HIV *diagnosis* does not tell us when persons were first *infected*, because HIV diagnosis may take place months or years after infection. In 2005, the Michigan Department of Health and Human Services (MDHHS) began incidence surveillance, which estimates new *infections* rather than new *diagnoses* using the Serologic Testing Algorithm for Recent HIV Seroconversion (STARHS). Early this year, we released estimated rates of recent infections for 2009-2013. Updated data for more recent years should be released later this year. All STARHS Incidence reports are available on our website.

Figure 1. Number and rate of new HIV diagnoses in Michigan, 2010–2014



KEY FINDINGS

- Rates of new diagnoses in Michigan remained **stable** overall.
- **Increases** were noted among those aged **25-29 yrs** at diagnosis.
- **Decreases** occurred for **females of other race** and **injection drug users (IDU)**.
- **Concurrent diagnoses** **decreased** overall as well as among **males overall, black males, and blacks** overall.
- Rates of new diagnoses remained **stable** among persons living in **SE MI** and in **Out-state Michigan**.

*Michigan discontinued use of the term 'AIDS' in January 2012 in accordance with the language in the 2008 HIV Case Definition released by the CDC. HIV infection is now classified by stage of disease, with stage 3 representing AIDS.

OVERVIEW OF TRENDS. Figure 1 shows the number and rate of new HIV diagnoses in Michigan by year for 2010 to 2014. The number and rate of new HIV diagnoses in Michigan remained stable during this time period for the sixth consecutive trend report. There was an average of 789 new cases per year and an average rate of 8 cases per 100,000 population.

Each year, there are more new diagnoses of HIV infection than deaths. As a result, the reported number of persons living with HIV in Michigan is increasing. MDHHS estimates that 18,800 persons were living with HIV infection in Michigan as of July 2015.

New HIV diagnoses by age at diagnosis

Between 2010 and 2014, the rate of new diagnoses increased significantly among persons 25-29 years of age (an average 6% per year). Rates in all other age groups were stable (Table 1).

This is the first report since 2013 to show an increase in rates among 25-29 year olds. This is the fifth trend report in nine reports that did not show significant increases in new diagnoses among 13-19 year olds. This is the second of six consecutive reports showing no increases among 20-24 year olds. Almost three quarters (71%) of teen and young adult cases combined are residents of Southeast (SE) Michigan. Of these cases, 60% were residents of the City of Detroit at the time of HIV diagnosis.

Though past trend reports showed decreases in rates among 40-44 year olds, rates have remained stable between 2010 and 2014. Before 2005, 35-39 year olds represented one of the highest rates of HIV diagnoses of all age groups. This group now represents the fourth highest rate, with the rates among 20-24, 25-29, and 30-34 year olds surpassing this group. These trends represent a continued shift in the epidemic to younger adults and highlight the large gap between rates among younger persons and older persons.

Of all teens diagnosed in the last five years, 82% are black compared to 60% of persons diagnosed at older ages. Furthermore, teens are much more likely to be black males who have sex with males (MSM) compared to adults 20 years and older (64% vs. 31%, respectively) (figure 2). This underscores a continued need for prevention campaigns tailored to young black MSM, as the rates in this group will likely widen the already large racial gap among persons living with HIV.

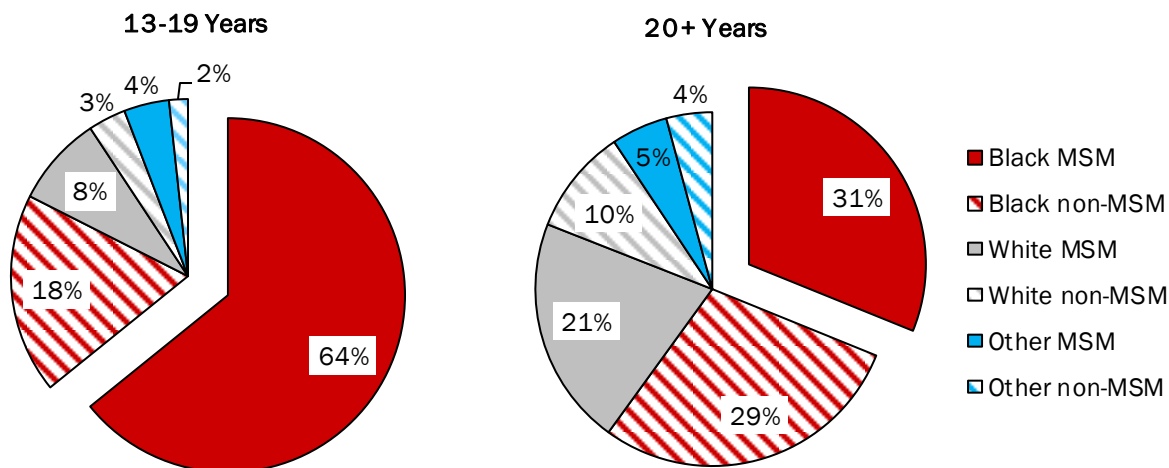
Table 1. New HIV diagnoses by age at diagnosis, 2010-2014

Age at diagnosis	Year of diagnosis														
	2010			2011			2012			2013			2014		
	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate
0 - 12 yrs	4	1%	0.2	9	1%	0.6	3	<1%	0.2	1	<1%	0.1	5	1%	0.3
13 - 19 yrs	55	7%	5.5	65	8%	6.6	62	8%	6.4	64	8%	6.7	46	6%	4.9
20 - 24 yrs	147	19%	21.8	181	23%	26.1	196	24%	27.3	165	22%	22.8	193	24%	26.4
25 - 29 yrs	123	16%	20.9	116	15%	19.8	134	17%	22.9	131	17%	22.0	159	20%	26.1 ↑ 6%
30 - 34 yrs	100	13%	17.4	87	11%	15.0	87	11%	14.9	84	11%	14.1	96	12%	16.2
35 - 39 yrs	83	11%	13.7	78	10%	13.5	73	9%	13.0	61	8%	10.9	68	8%	12.1
40 - 44 yrs	70	9%	10.6	68	9%	10.3	79	10%	12.1	60	8%	9.4	56	7%	9.0
45 - 49 yrs	81	10%	10.9	78	10%	10.9	62	8%	8.9	73	9%	10.7	68	8%	10.3
50 - 54 yrs	59	8%	7.7	53	7%	7.0	52	6%	6.9	57	8%	7.7	45	6%	6.1
55 - 59 yrs	28	4%	4.1	27	3%	3.9	30	4%	4.2	29	4%	4.0	43	5%	5.9
60 and over	27	3%	1.4	30	4%	1.5	24	3%	1.2	38	5%	1.8	24	3%	1.1
Total	777	100%	7.9	794	100%	8.0	804	100%	8.1	765	100%	7.7	804	100%	8.1

TABLE FOOTNOTES:

- The number of new diagnoses shown are not reported case counts. These are estimates based on the number of reported cases that are adjusted to account for reporting delay. As a result, summed counts will not always match the column total shown due to rounding error.
- **Bold/Colored text** indicates that statistically significant trends occurred in that group. The arrow indicates the direction of change in rates over the 5-year period, while the percentage is the *average change per year* in the rates, as calculated using regression modeling.
- Rates are per 100,000 population.

Figure 2. MSM vs. non-MSM risk by race and age at HIV diagnosis, 2010-2014



New HIV diagnoses by race/sex

The rate of new diagnoses decreased among females of other race (average 17% per year) between 2010 and 2014. Rates among all other race/sex groups remained stable. This is the second of five trend reports not to show increases among black females. The rate of new diagnoses remained highest among black persons of both sexes compared to all other race/sex groups. In 2014, the rate among black males was more than 10 times that of white males, and the rate among black females about 20 times that of white females. These disparities have persisted since we began analyzing HIV trends in MI, and although we've seen decreases in new diagnoses among black males and females over the years, the rate difference between black and white females and between black and white males seems to have remained relatively stable.

Table 2. New HIV diagnoses by race/sex, 2010-2014

Race/Sex	Year of diagnosis														
	2010			2011			2012			2013			2014		
	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate
Male	627	81%	12.9	631	80%	13.0	655	82%	13.5	632	83%	13.0	657	82%	13.5
Black	356	46%	54.1	377	47%	57.3	392	49%	59.6	404	53%	61.6	379	47%	57.8
White	215	28%	5.8	199	25%	5.4	208	26%	5.6	175	23%	4.7	206	26%	5.5
Other	56	7%	12.3	55	7%	11.8	56	7%	11.7	53	7%	10.8	72	9%	14.3
Female	150	19%	3.0	162	20%	3.2	149	18%	3.0	132	17%	2.6	147	18%	2.9
Black	113	15%	15.5	111	14%	15.3	103	13%	14.2	91	12%	12.5	108	13%	14.9
White	22	3%	0.6	31	4%	0.8	31	4%	0.8	32	4%	0.8	28	4%	0.7
Other	15	2%	3.2	20	3%	4.2	14	2%	2.9	9	1%	1.8	10	1%	2.0
All	777	100%	7.9	794	100%	8.0	804	100%	8.1	765	100%	7.7	804	100%	8.1
Black	469	60%	33.8	488	62%	35.2	495	62%	35.8	494	65%	35.8	487	61%	35.3
White	237	30%	3.1	230	29%	3.1	239	30%	3.2	208	27%	2.8	234	29%	3.1
Other	71	9%	7.7	75	9%	8.0	70	9%	7.3	62	8%	6.3	83	10%	8.1

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- **Bold/Colored text** indicates that statistically significant trends occurred in that group. The arrow indicates the direction of change in rates over the 5-year period, while the percentage is the *average change per year* in the rates, as calculated using regression modeling.
- Rates are per 100,000 population.

New HIV diagnoses by risk

Between 2010 and 2014, the number of newly diagnosed persons who were injection drug users (IDU) decreased significantly by an average of 12% per year. Recently, IDU have garnered national attention due to an outbreak of HIV infection among IDU in Indiana. Despite this, Michigan continues to see decreases among this group.

There were no significant changes in diagnoses among any other risk groups. This is the third trend report not to reflect decreases among heterosexuals in the past seven reports.

New diagnoses among persons with no identified risk (NIR) remained stable between 2010 and 2014. There is a targeted effort to reduce the number of new diagnoses with NIR. Risk information is important information for prevention efforts; thus, it is crucial that risk questions be answered on the adult case report form (ACRF). Protocols and partnerships are currently in place to achieve better risk ascertainment.

Figure 3 illustrates trends among MSM by race. MSM were more than half of all new diagnoses between 2010 and 2014 (57%). Of these newly diagnosed MSM, 57% are black. The number of MSM cases remained stable among all race groups between 2010 and 2014. Though there was no significant increase in the number of black MSM cases, as has been seen in past reports, black males continue to make up the largest proportion of all MSM HIV cases in Michigan.

Concurrent diagnoses

The proportion of persons diagnosed with stage 3 HIV infection within 30 days of diagnosis (concurrent diagnoses) decreased significantly overall from 22% to 20% between 2010 and 2014 (table 4). Similarly there were significant decreases in the proportion of concurrent diagnoses among all males as well as black males. The proportion decreased in blacks overall, most likely due to decreases among black males (who made up 77% of black diagnoses between 2010 and 2014). Last year, we saw increases in concurrent diagnoses overall, among males, black males, and blacks overall for the first time since we began analyzing trends in 2001. There was no significant difference in the proportion of concurrent diagnoses between men and women, but persons of black race had significantly fewer

Table 3. New HIV diagnoses by risk, 2010-2014

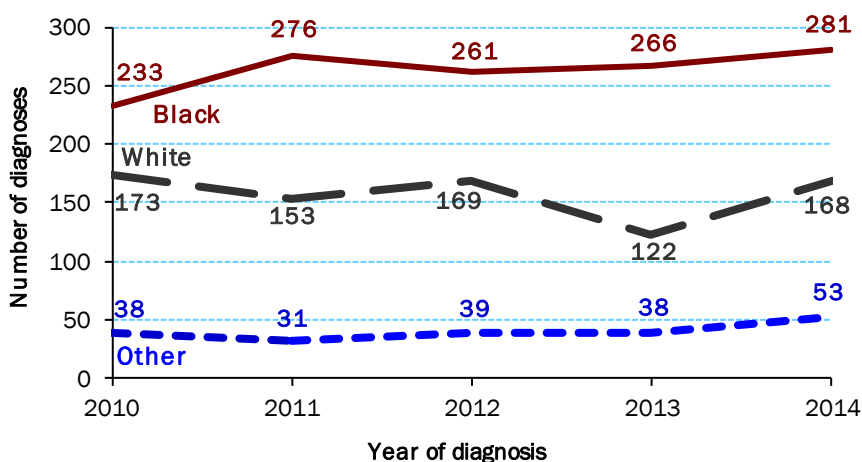
Risk	Year of diagnosis									
	2010		2011		2012		2013		2014	
	Num	%	Num	%	Num	%	Num	%	Num	%
MSM	436	56%	444	56%	458	57%	413	54%	490	61%
IDU	35	5%	27	3%	28	4%	33	4%	15	2%
MSM/IDU	8	1%	16	2%	12	1%	13	2%	12	2%
Heterosexual	138	18%	138	17%	127	16%	129	17%	139	17%
Other known	4	1%	9	1%	3	<1%	4	1%	6	1%
No identified risk	156	20%	159	20%	177	22%	171	22%	142	18%
Total	777	100%	794	100%	804	100%	765	100%	804	100%

TABLE FOOTNOTES:

- The number of new diagnoses shown are not reported case counts. These are estimates based on the number of reported cases that are adjusted to account for reporting delay. As a result, summed counts will not always match the column total shown due to rounding error.
- Bold/Colored text** indicates that statistically significant trends occurred in that group. The arrow indicates the direction of change in number of new diagnoses over the 5-year period, while the percentage is the *average change per year* in the the number of new diagnoses, as calculated using regression modeling.
- The heterosexual category includes males whose female sexual partners are known to be HIV-infected or at high risk for HIV and females who reported sex with males regardless of what is known about their partners' HIV status or risk. The "other known" risk category includes perinatal and blood product transmission. The NIR category includes males who reported sex with females of unknown risk/HIV status as their only risk and males and females for whom no risk has yet been reported.

↓ 12%

Figure 3. Race among MSM, 2010-2014



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Concurrent diagnoses (cont.)

concurrent diagnoses than persons of all other races (19% vs. 25%, respectively). Many concurrent diagnoses represent a failure to diagnose HIV early in the course of the infection and/or a failure to initiate early treatment. Persons who are unaware of their HIV infection cannot benefit from early antiretroviral therapy and have a poorer prognosis than those diagnosed earlier in the disease course. They are also not accessible for primary prevention (transmission to uninfected individuals). Expanding routine HIV testing in medical settings and provision of HIV testing at community-based and outreach settings will promote and facilitate access to HIV testing, which may improve health outcomes for those who are infected.

Table 4. Concurrent HIV diagnoses by race/sex, 2010-2014

Race/Sex	Year of diagnosis										Total			
	2010		2011		2012		2013		2014				Num	%
	Num	%	Num	%	Num	%	Num	%	Num	%				
Male	149	24%	115	18%	134	21%	169	27%	127	19%	694	22%	↓ 5%	
Black	77	22%	57	15%	65	17%	96	24%	61	16%	357	19%	↓ 6%	
White	60	28%	51	26%	57	28%	54	31%	46	22%	268	27%		
Other	12	21%	7	13%	12	21%	18	34%	20	28%	69	24%		
Female	24	16%	34	21%	26	18%	29	22%	33	23%	147	20%		
Black	19	17%	22	20%	20	19%	20	22%	27	25%	108	21%		
White	3	14%	5	16%	2	6%	8	25%	6	21%	24	17%		
Other	2	13%	7	35%	4	29%	1	11%	0	0%	14	21%		
All	173	22%	149	19%	160	20%	198	26%	160	20%	841	21%	↓ 2%	
Black	96	20%	79	16%	85	17%	117	24%	88	18%	465	19%	↓ 2%	
White	63	27%	56	24%	59	25%	62	30%	52	22%	292	25%		
Other	14	20%	14	19%	16	23%	19	31%	20	25%	83	23%		

TABLE FOOTNOTES:

- The number of new diagnoses shown are not reported case counts. These are estimates based on the number of reported cases that are adjusted to account for reporting delay. As a result, summed counts will not always match the column total shown due to rounding error.
- Percentages reflect the number of concurrent diagnoses for a race/sex/year combination divided by the total diagnoses for that race/sex/year combination.
- **Bold/Colored text** indicates that statistically significant trends occurred in that group. Significance was assessed using the Mantel-Haenszel chi-square test. The arrow indicates the direction of change while the accompanying percentage is the *change in proportion of concurrent diagnoses* from 2010 to 2014, which do not take into account the fluctuations from year to year.

New HIV diagnoses by residence at diagnosis

The rate of new HIV diagnoses remained relatively stable in Southeast Michigan (Lapeer, Macomb, Monroe, Oakland, St. Clair, and Wayne counties), as well as the rest of the state between 2010 and 2014 (table 5). It is also important to note that the burden of new diagnoses continues to disproportionately affect Southeast Michigan (SE MI).

Table 5. New HIV diagnoses by residence at diagnosis, 2010-2014

Residence	Year of diagnosis														
	2010			2011			2012			2013			2014		
	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate
SE MI	537	70%	12.6	532	68%	12.5	552	69%	13.0	506	67%	11.9	532	67%	12.5
Out-state	233	30%	4.2	255	32%	4.5	249	31%	4.4	254	33%	4.5	265	33%	4.7
Prison or Unknown	7	1%	N/A	7	1%	N/A	3	0%	N/A	4	1%	N/A	6	1%	N/A
Total*	770	100%	7.9	787	100%	8.0	801	100%	8.1	760	100%	7.7	798	100%	8.1

TABLE FOOTNOTES:

- The number of new diagnoses shown are not reported case counts. These are estimates based on the number of reported cases that are adjusted to account for reporting delay. As a result, summed counts will not always match the column total shown due to rounding error.
- Rates are per 100,000 population.

Summary

- The number and rate of new HIV diagnoses in Michigan remained stable between 2010 and 2014 for the 6th consecutive trend report, with an average of 789 new cases per year and an average rate of 8.
- The highest rates of new HIV diagnoses occurred among:
 - 20 - 24 and 25-29 year olds
 - Black males and females
 - Men who have sex with men (MSM)*
 - SE MI residents
- INCREASES in rates occurred among:
 - 25-29 year olds
- DECREASES in rates occurred among:
 - Females of other race
 - Injection drug users (IDU)*
- Very few significant changes were found among the various subgroups analyzed, suggesting that new diagnoses overall are becoming increasingly stable each year.
- Almost three quarters of Michigan's new cases among 13 - 24 year olds were residents of SE MI at diagnosis. Of these SE MI young adults, 60% lived in the City of Detroit.
- 82% of new 13 - 19 year old cases are black (of whom 78% are MSM), whereas 60% of those aged 20 and older are black. This finding suggests that black teens and young adults in general, and young black MSM in particular, should continue to be the focus of aggressive prevention activities.
- Race and sex disparities in rates of new HIV diagnoses remain. Comparing the diagnosis rates of black persons and white persons in 2014:
 - **Overall:** The rate for black persons was over 11 times higher
 - **Males:** The rate for black males was over 10 times higher
 - **Females:** The rate for black females was almost 20 times higher
- Decreases in concurrent diagnoses occurred overall as well as among males overall, black males, and blacks overall.

*Annual counts were analyzed for risk groups since there are no reliable denominator data available for rate calculation.

For more information:

Michigan Department of Health and Human Services HIV Surveillance Program

(248) 424-7910
(517) 335-8165

(www.michigan.gov/hivstd) → HIV Case Reporting and Data → HIV
Statistics and Data Reports)
State of Michigan HIV Statistics and Reports

Michigan Department of Health and Human Services HIV Prevention and Care Section

(517) 241-5900

(www.michigan.gov/hivstd)
State of Michigan HIV/AIDS Programmatic Information

MI Counseling, Testing, & Referral Sites
www.miunified.org/Get-Help/Services

Michigan AIDS Hotline
1-800-872-2437

Centers for Disease Control & Prevention

www.cdc.gov/hiv
CDC HIV/AIDS Resources

AIDSInfo

www.aidsinfo.nih.gov
HIV/AIDS Treatment and Clinical Trial Resources

CDC National Statistics & Surveillance

www.cdc.gov/hiv/statistics
CDC HIV/AIDS Statistics and Reports

World Health Organization

www.who.int/topics/hiv_aids/en
HIV/AIDS Global Resources