



ANNUAL REVIEW OF HIV TRENDS IN MICHIGAN (2007 - 2011)

Bureau of Disease Control, Prevention and Epidemiology
HIV/STD/VH/TB Epidemiology Section, April 2013

Overall trends in new Michigan HIV diagnoses

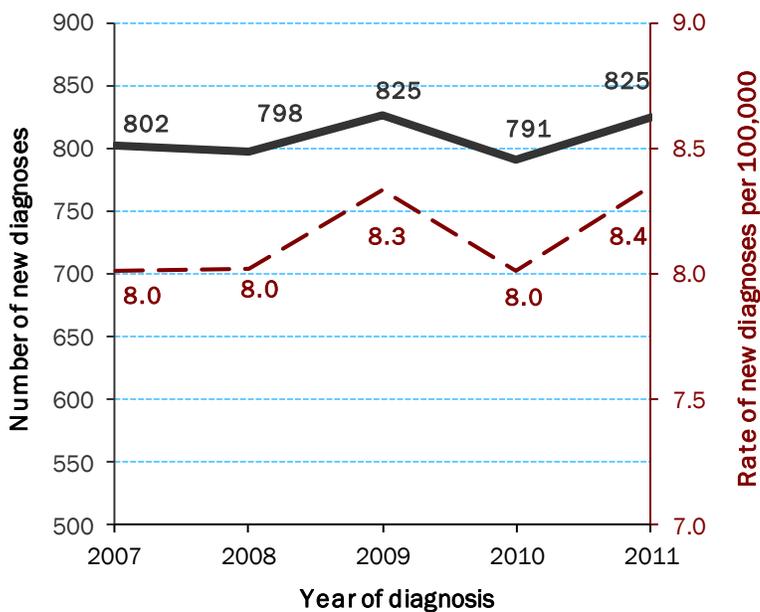
METHODS. To evaluate trends in new HIV diagnoses in Michigan over time, we estimated the number of persons newly diagnosed with HIV infection between 2007 and 2011 by adjusting the number of reported cases to account for those who may not have been reported to the health department by January 1, 2013. 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 intercensal annual population estimates released by the Census Bureau in 2011 and based on the 2010 Census, the most recent year for which 2007-2011 data were available. Rates for age at diagnosis were calculated using the 2011 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, MDCH began incidence surveillance, which estimates new *infections* rather than new *diagnoses* using the Serologic Testing Algorithm for Recent HIV Seroconversion (STARHS). Last year, we released estimated rates of recent infections for 2006-2009. Updated data for 2006-2010 are being released concurrently with this report. All STARHS Incidence reports are available on our website.

Figure 1. Number and rate of new HIV diagnoses in Michigan, 2007–2011



KEY FINDINGS

- Rates of new diagnoses in Michigan remained **stable** overall.
- **Increases** were noted among **20-24** and **25-29** year olds; **decreases** occurred for **40-44** year olds.
- There were **decreases** among **IDUs** for the **8th consecutive** report as well as among **heterosexuals**. There were **increases** among persons with **no identified risk (NIR)**.
- Rates **increased** among **males** and **decreased** among **all females** and **black females**. The rate among **white persons** also **increased**.
- **Concurrent** diagnoses **decreased** among **males** and **overall**.
- Rates of new diagnoses **increased** among persons living in **Southeast Michigan** at diagnosis.

*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 2007 to 2011. The number and rate of new HIV diagnoses in Michigan remained stable during this time period for the third consecutive trend report. There was an average of 808 new cases per year and an average rate of 8.2 cases per 100,000 population. The rate rose to 8.4 in 2011 from 8.0 in 2010.

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. MDCH estimates that 19,300 persons were living with HIV infection in Michigan as of January 2012.

New HIV diagnoses by age at diagnosis

The rate of new HIV diagnoses increased significantly among persons 20-24 years of age (an average 11% per year) and among those 25-29 years of age (5% per year). The rate decreased significantly among persons 40-44 years of age (table 1).

This is the second trend report in six reports that did not show significant increases in new diagnoses among 13-19 year olds. This is the third consecutive report, however, showing increases among 20-24 year olds, and the second to show increases among 25-29 year olds. Additionally, the rate among 13-19 and 20-24 year olds combined increased significantly by 8% and continues to represent a growing proportion of new diagnoses. Almost three quarters of teen and young adult cases combined are residents of Southeast (SE) Michigan. Of these cases, 63% were residents of the City of Detroit at the time of HIV diagnosis.

This is the second consecutive trend report showing decreases in rates among 40-44 year olds. In past years, 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 20-34, 25-29, and 30-34 year olds surpassing this group. These trends represent a continued shift in the epidemic to younger adults.

Of all teens diagnosed in the last five years, 84% 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 (59% vs. 26%, 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.

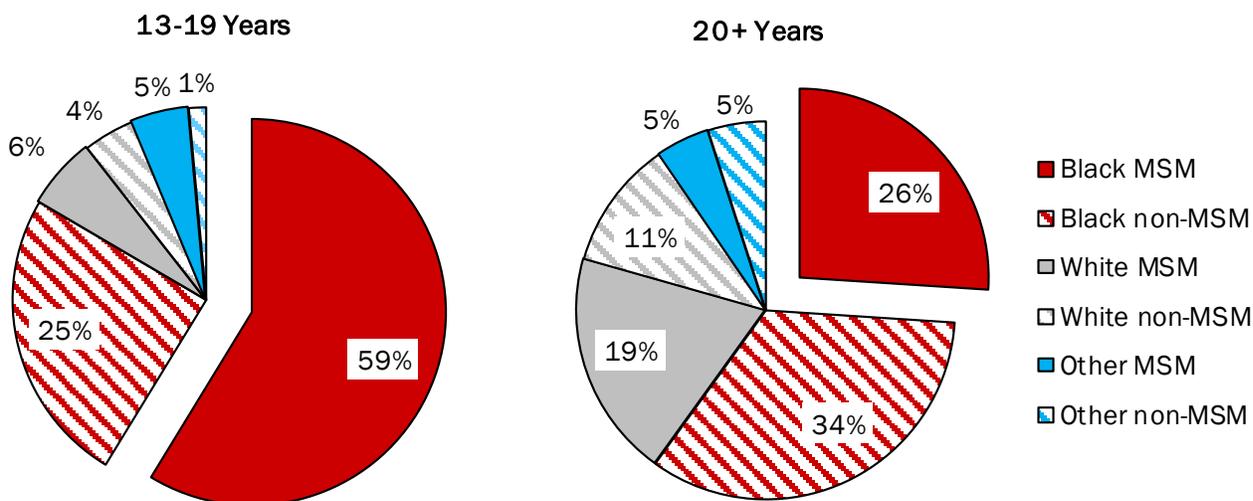
Table 1.+ New HIV diagnoses by age at diagnosis, 2007-2011

Age at diagnosis	2007			2008			2009			2010			2011			
	Num	%	Rate													
0 - 12 yrs	3	<1%	0.2	5	1%	0.3	5	1%	0.3	5	1%	0.3	9	1%	0.6	
13 -19 yrs	71	9%	6.7	77	10%	7.4	78	10%	7.6	58	7%	5.7	70	8%	7.1	
20 -24 yrs	106	13%	15.8	131	16%	19.8	150	18%	22.6	149	19%	22.0	182	22%	26.1	↑ 11%
25 -29 yrs	100	12%	16.4	117	15%	19.4	124	15%	20.8	124	16%	21.1	126	15%	21.4	↑ 5%
30 -34 yrs	91	11%	15.5	86	11%	15.0	87	11%	15.3	101	13%	17.5	89	11%	15.2	
35 -39 yrs	104	13%	15.3	101	13%	15.4	91	11%	14.4	86	11%	14.2	81	10%	14.0	
40 -44 yrs	119	15%	16.4	90	11%	12.9	90	11%	13.4	73	9%	11.0	72	9%	10.9	↓ 10%
45 -49 yrs	87	11%	11.1	76	10%	9.9	69	8%	9.1	79	10%	10.7	83	10%	11.6	
50 -54 yrs	65	8%	8.8	50	6%	6.6	67	8%	8.8	61	8%	7.9	56	7%	7.3	
55 -59 yrs	26	3%	4.0	31	4%	4.7	40	5%	6.0	28	4%	4.1	27	3%	3.8	
60 and over	29	4%	1.6	31	4%	1.7	22	3%	1.2	27	3%	1.4	30	4%	1.5	
Total	802	100%	8.0	798	100%	8.0	825	100%	8.3	791	100%	8.0	825	100%	8.4	

†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, 2007-2011



New HIV diagnoses by race/sex

The rate of new diagnoses increased among males (average 2% per year) between 2007 and 2011 for the second consecutive trend report. The rate decreased among black females (average 3% per year) and among females overall (4% per year) for the third consecutive report (table 2). The rate among white persons increased for the first time (average 2% per year). The rate of new diagnoses remained highest among black persons of both sexes compared to all other race/sex groups. In 2011, the rate among black males was 11 times that of white males, and the rate among black females was 20 times that of white females. These disparities have persisted since we began analyzing HIV trends in MI in 2001, and although decreases in new diagnoses among black females have narrowed the rate difference between black and white females, the gap between black and white males has increased in recent years.

Table 2.+ New HIV diagnoses by race/sex, 2007-2011

Race/Sex	Year of diagnosis															
	2007			2008			2009			2010			2011			
	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate	
Male	614	77%	12.5	625	78%	12.8	661	80%	13.6	635	80%	13.1	658	80%	13.6	↑2%
Black	348	43%	52.0	387	49%	58.3	397	48%	60.2	362	46%	54.9	393	48%	59.7	
White	199	25%	5.2	180	23%	4.8	213	26%	5.7	218	28%	5.9	204	25%	5.5	
Other	67	8%	15.4	58	7%	13.2	50	6%	11.2	55	7%	11.9	61	7%	13.0	
Female	187	23%	3.7	173	22%	3.4	165	20%	3.3	156	20%	3.1	167	20%	3.3	↓3%
Black	140	17%	18.9	118	15%	16.1	129	16%	17.6	116	15%	16.0	115	14%	15.8	↓4%
White	28	3%	0.7	38	5%	1.0	20	2%	0.5	23	3%	0.6	31	4%	0.8	
Other	19	2%	4.4	16	2%	3.6	16	2%	3.6	16	2%	3.5	21	2%	4.3	
All	802	100%	8.0	798	100%	8.0	825	100%	8.3	791	100%	8.0	825	100%	8.4	
Black	488	61%	34.6	506	63%	36.1	526	64%	37.8	479	61%	34.5	509	62%	36.6	
White	227	28%	2.9	218	27%	2.8	233	28%	3.1	242	31%	3.2	235	28%	3.1	↑2%
Other	86	11%	9.9	74	9%	8.4	66	8%	7.4	71	9%	7.7	81	10%	8.6	

†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.

New HIV diagnoses by risk

Between 2007 and 2011, the number of newly diagnosed persons who were injection drug users (IDU) decreased by an average of 14% per year. There were also decreases among heterosexuals (8% per year) (table 3). The decrease among IDU has occurred in the past eight trend reports. This is the fourth consecutive trend report to reflect decreases among heterosexuals. Data from Michigan's HIV Behavioral Surveillance (collected in 2009) suggest reductions among IDUs may be partly attributable to the success of harm reduction programs, such as needle exchanges.

The "other known" risk category includes perinatal and blood product transmission. The numbers have been low in this group for many years, owing to programmatic successes in preventing perinatal and blood-borne transmissions.

New diagnoses among persons with no identified risk (NIR) increased 6% between 2007 and 2011. Risk information is important information for prevention efforts; thus, it is crucial that risk questions be answered on the adult case report form (ACRF).

Table 3.† New HIV diagnoses by risk, 2007-2011

Risk	Year of diagnosis									
	2007		2008		2009		2010		2011	
	Num	%	Num	%	Num	%	Num	%	Num	%
MSM	394	49%	386	48%	406	49%	407	51%	419	51%
IDU	50	6%	34	4%	25	3%	36	5%	24	3%
MSM/IDU	14	2%	21	3%	13	2%	6	1%	12	1%
Heterosexual	161	20%	121	15%	135	16%	111	14%	112	14%
Other known	3	<1%	4	1%	2	<1%	5	1%	9	1%
No identified risk	179	22%	231	29%	244	30%	225	29%	248	30%
Total	802	100%	798	100%	825	100%	791	100%	825	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 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.

Figure 3. Race among MSM, 2007-2011

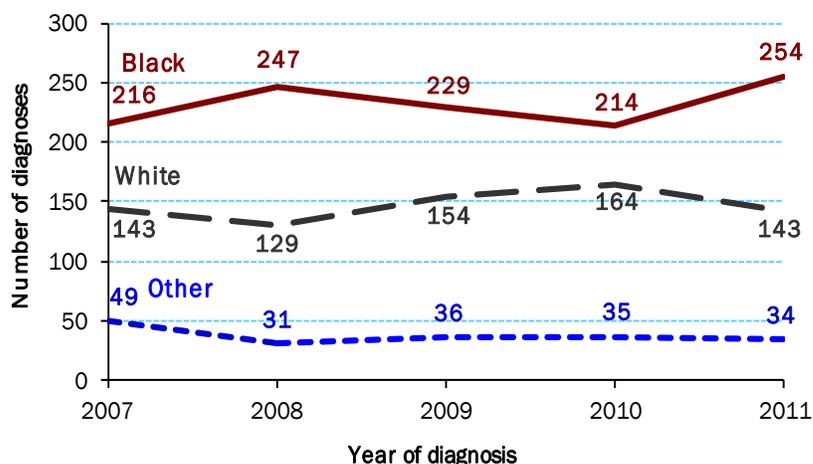


Figure 3 illustrates trends among MSM by race. MSM were half of all new diagnoses between 2007 and 2011. Of these newly diagnosed MSM, 58% are black. There were no significant increases or decreases in new diagnoses among MSM of any race between 2007 and 2011, but black males continue to make up the 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 25% in 2007 to 18% in 2011 (table 4). There were also significant decreases in the proportion of concurrent diagnoses among males overall (26% to 22%). Men had a significantly higher proportion of concurrent diagnoses than women, and persons of black race had significantly fewer concurrent diagnoses than persons of all other races (19% vs. 25%, respectively). Many concurrent diagnoses represent a failure to diagnose HIV

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Concurrent diagnoses (cont.)

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, 2007-2011

Race/Sex	Year of diagnosis										Total			
	2007		2008		2009		2010		2011				Num	%
	Num	%	Num	%	Num	%	Num	%	Num	%				
Male	159	26%	143	23%	130	20%	147	23%	117	18%	696	22%	↓8%	
Black	77	22%	70	18%	70	18%	74	20%	59	15%	350	19%		
White	66	33%	54	30%	48	23%	60	28%	51	25%	279	28%		
Other	16	24%	19	33%	12	24%	13	24%	6	10%	66	23%		
Female	40	21%	32	19%	26	16%	25	16%	35	21%	158	19%		
Black	29	21%	25	21%	22	17%	20	17%	23	20%	119	19%		
White	9	32%	4	10%	4	20%	3	13%	5	16%	25	18%		
Other	2	11%	3	19%	0	0%	2	12%	7	35%	14	16%		
All	199	25%	175	22%	156	19%	172	22%	151	18%	854	21%	↓6%	
Black	106	22%	95	19%	92	17%	94	20%	82	16%	469	19%		
White	75	33%	58	27%	52	22%	63	26%	56	24%	304	26%		
Other	18	21%	22	30%	12	18%	15	21%	13	16%	80	21%		

†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 2007 to 2011, 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 increased in Southeast Michigan (Lapeer, Macomb, Monroe, Oakland, St. Clair, and Wayne counties) between 2007 and 2011 by an average 1% per year. The rate in the rest of the state ("Out-State") remained stable (table 5). The burden of new diagnoses continues to disproportionately affect SE MI.

Table 5.* New HIV diagnoses by residence at diagnosis, 2007-2011

Residence	Year of diagnosis															
	2007			2008			2009			2010				2011		
	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate		Num	%	Rate
SE Michigan	546	70%	12.6	549	71%	12.7	562	69%	13.1	548	70%	12.9	563	69%	13.2	↑1%
Out-state	235	30%	4.5	228	29%	4.0	249	31%	4.4	236	30%	4.2	253	31%	4.5	
Prison or Unknown	20	3%	N/A	21	3%	N/A	14	2%	N/A	7	1%	N/A	8	1%	N/A	
Total*	781	100%	8.0	776	100%	8.0	811	100%	8.3	784	100%	8.0	817	100%	8.4	

†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 2007 and 2011 for the 3rd consecutive trend report, with an average of 808 new cases per year and an average rate of 8.2.
- 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)*
 - Southeast Michigan residents
- INCREASES in rates occurred among:
 - 20 - 24 year olds (3rd consecutive trend report) and 25-29 year olds (2nd consecutive report)
 - Males
 - White persons
 - Persons with no identified risk (NIR)
 - Southeast Michigan residents
- DECREASES in rates occurred among:
 - 40-44 year olds (3rd consecutive report)
 - Black females (3rd consecutive report) and females overall (4th consecutive report)
 - Injection drug users (8th consecutive report) and heterosexuals (4th consecutive report)*
- Almost three quarters of Michigan's new cases among 13 - 24 year olds were residents of SE Michigan at diagnosis. Of these SE MI young adults, 63% lived in the City of Detroit.
- 84% of new 13 - 19 year old cases are black (of whom 70% 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.
- Decreases in concurrent diagnoses occurred overall as well as among males overall. This is the first report in several reports to not show broad decreases in concurrent diagnoses among multiple race/sex subgroups, suggesting that the effect of improved early case detection may be slowing.

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

For more information:

Michigan Department of Community Health HIV/AIDS Surveillance Program

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

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

Michigan Department of Community Health HIV/AIDS Prevention and Intervention Services

(517) 241-5900

(www.michigan.gov/hivstd) → HIV/AIDS → Prevention and Care
State of Michigan HIV/AIDS Programmatic Information

MI Counseling, Testing, & Referral Sites

<http://www.aidspartnership.org/index.php/testing-and-locations/>

Michigan AIDS Hotline 1-800-872-2437

Centers for Disease Control & Prevention

<http://www.cdc.gov/hiv>
CDC HIV/AIDS Resources

AIDSInfo

<http://www.aidsinfo.nih.gov/>
HIV/AIDS Treatment and Clinical Trial Resources

CDC National Statistics & Surveillance

<http://www.cdc.gov/hiv/topics/surveillance/index.htm>
CDC HIV/AIDS Statistics and Reports

World Health Organization

http://www.who.int/topics/hiv_infections/en/
HIV/AIDS Global Resources