

# ANNUAL REVIEW OF HIV TRENDS IN MICHIGAN (2005 - 2009)

Bureau of Disease Control, Prevention and Epidemiology  
HIV/STD/VH/TB Epidemiology Section, December 2011

## Overall trends in new Michigan HIV diagnoses

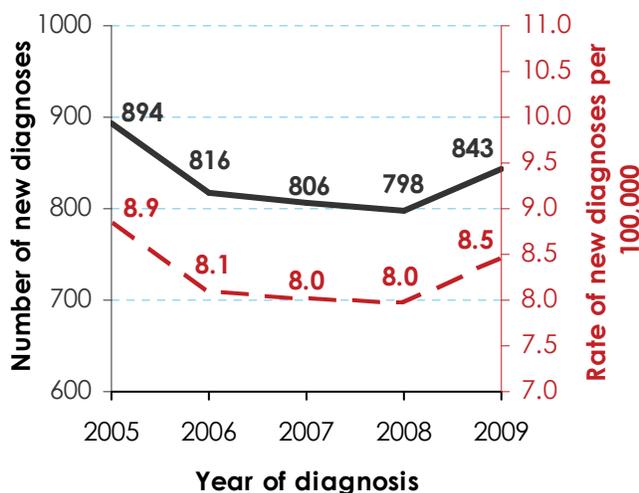
**METHODS.** To evaluate trends in new HIV diagnoses in Michigan over time, we estimated the number of persons newly diagnosed with HIV infection from 2005 through 2009 by adjusting the number of reported cases to account for those who may not have been reported to the health department by January 1, 2011. These adjustments were made by weighting the data. The weighting process was modified for the current trend report which may result in slightly different estimates than those in previous reports.

Unless otherwise noted, numbers cited include persons living with HIV, non-AIDS and those who have progressed to AIDS. 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 updated intercensal annual population estimates released by the Census Bureau in 2009, the most recent year for which 2005-2009 data were available. Rates for age at diagnosis were calculated using the Vintage 2009 Bridged-Race Postcensal 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 an AIDS diagnosis 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. However, this is the best current measure of how fast the epidemic is spreading among different populations. MDCH began incidence surveillance, which estimates new *infections* rather than new *diagnoses* using the Serologic Testing Algorithm for Recent HIV Seroconversion (STARHS), in 2005. We will supplement this report with incidence data once they are available for multiple years.

Figure 1. Number and rate of new HIV diagnoses, Michigan, 2005–2009



## KEY FINDINGS

- Rates of new diagnoses in Michigan remained **stable** overall.
- **Increases** were noted among **teens** for the **6th consecutive** trend report as well as among **young adults**; **decreases** occurred for **25-49 year olds**.
- **85%** of newly diagnosed **teens** are **black** and **60%** are **black MSM**.
- There were **decreases** among **IDUs** for the **6th consecutive** report as well as among **MSM/IDU** and **heterosexuals**.
- Rates **increased** among **black males** and **decreased** among **black and white females**.
- **Concurrent diagnoses** **decreased** among **several subgroups** and **overall** for the **4th consecutive** trend report.

**OVERVIEW OF TRENDS.** The number and rate of new HIV diagnoses in Michigan remained stable between 2005 and 2009 after decreasing significantly in the previous trends report. There was an average of 831 new cases per year and an average rate of 8.2. The rate was highest in 2005 at 8.9 per 100,000 and is likely due to the implementation of mandatory laboratory reporting in 2005 (Figure 1). Prior to this, the HIV Surveillance Program in Michigan relied on laboratories that voluntarily reported positive HIV-related tests and health care providers, who are required by law to report positive cases. After 2005, the rate decreased for three years before rising to 8.5 in 2009.

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 18,800 people were living with HIV infection in Michigan as of January 2010.

## New HIV diagnoses by age at diagnosis

The rate of new diagnoses increased significantly among persons 13-19 years of age (an average 15% per year) and among those 20-24 years of age (8% per year). The rate decreased significantly among persons 25-29, 30-34, 35-39, 40-44, and 45-49 years of age (Table 1).

This is the sixth consecutive trend report showing significant increases in new diagnoses among 13-19 year olds. While two-thirds of new cases overall are in Southeast (SE) Michigan, nearly three-fourths of the state's new 13-19 year old cases are SE Michigan residents. Of these SE Michigan 13-19 year old cases, 47% reside in the city of Detroit and 25% reside in other parts of SE Michigan.

The rate of new diagnoses among 20-24 year olds also increased, while rates in older age groups (25-49 year olds) decreased. While the largest number and highest rates of cases remain in the 20-44 year old population, these trends suggest the epidemic is becoming more pronounced in teens and young adults while decreasing or remaining stable in older adults.

Of all teens diagnosed in the last five years, 85% 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 (60% vs. 24%, 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.

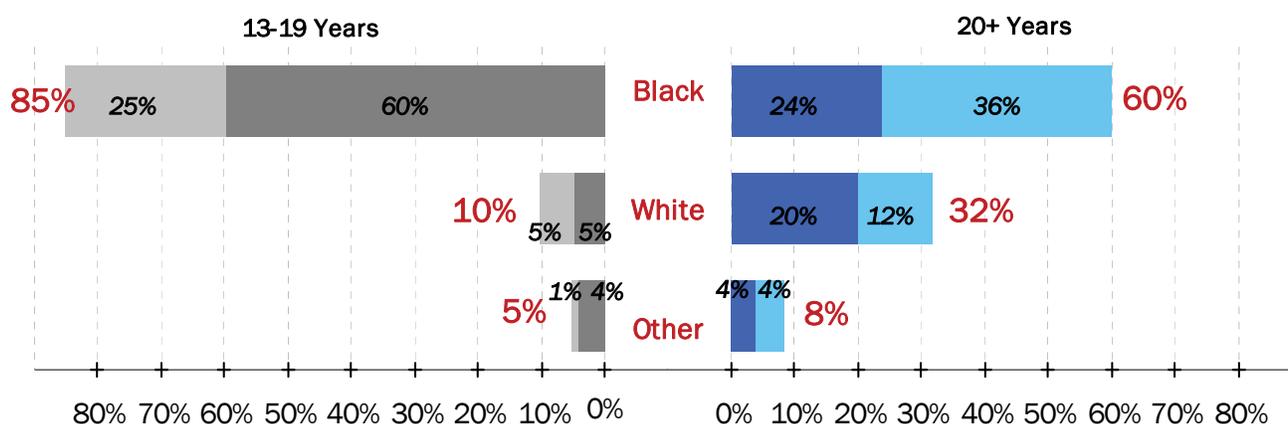
Table 1.\* New HIV diagnoses by age at diagnosis, 2005-2009

Age at diagnosis	Year of diagnosis										
	2005		2006		2007		2008		2009		
	Num (%)	Rate									
0 - 12 yrs	3 (0%)	0.2	4 (0%)	0.2	3 (0%)	0.2	6 (1%)	0.4	4 (0%)	0.3	
<b>13 -19 yrs</b>	<b>45 (5%)</b>	<b>4.3</b>	<b>56 (7%)</b>	<b>5.4</b>	<b>72 (9%)</b>	<b>6.9</b>	<b>78 (10%)</b>	<b>7.6</b>	<b>80 (10%)</b>	<b>8.0</b>	<b>↑ 15%</b>
<b>20 -24 yrs</b>	<b>116 (13%)</b>	<b>16.4</b>	<b>109 (13%)</b>	<b>15.4</b>	<b>107 (13%)</b>	<b>15.3</b>	<b>129 (16%)</b>	<b>18.6</b>	<b>148 (18%)</b>	<b>21.4</b>	<b>↑ 8%</b>
<b>25 -29 yrs</b>	<b>108 (12%)</b>	<b>17.6</b>	<b>98 (12%)</b>	<b>15.7</b>	<b>98 (12%)</b>	<b>15.4</b>	<b>119 (15%)</b>	<b>18.8</b>	<b>124 (15%)</b>	<b>20.0</b>	<b>↓ 5%</b>
<b>30 -34 yrs</b>	<b>134 (15%)</b>	<b>20.7</b>	<b>100 (12%)</b>	<b>16.3</b>	<b>95 (12%)</b>	<b>16.0</b>	<b>85 (11%)</b>	<b>14.7</b>	<b>88 (10%)</b>	<b>15.3</b>	<b>↓ 8%</b>
<b>35 -39 yrs</b>	<b>123 (14%)</b>	<b>17.5</b>	<b>131 (16%)</b>	<b>18.8</b>	<b>105 (13%)</b>	<b>15.2</b>	<b>102 (13%)</b>	<b>15.3</b>	<b>95 (11%)</b>	<b>14.7</b>	<b>↓ 5%</b>
<b>40 -44 yrs</b>	<b>138 (15%)</b>	<b>17.7</b>	<b>132 (16%)</b>	<b>17.3</b>	<b>124 (15%)</b>	<b>16.8</b>	<b>89 (11%)</b>	<b>12.5</b>	<b>96 (11%)</b>	<b>13.9</b>	<b>↓ 7%</b>
<b>45 -49 yrs</b>	<b>100 (11%)</b>	<b>12.5</b>	<b>84 (10%)</b>	<b>10.5</b>	<b>86 (11%)</b>	<b>10.8</b>	<b>78 (10%)</b>	<b>10.0</b>	<b>72 (9%)</b>	<b>9.3</b>	<b>↓ 7%</b>
50 -54 yrs	68 (8%)	9.5	50 (6%)	6.9	63 (8%)	8.5	48 (6%)	6.3	71 (8%)	9.3	
55 -59 yrs	33 (4%)	5.4	31 (4%)	4.9	26 (3%)	4.1	31 (4%)	4.8	41 (5%)	6.2	
60 and over	25 (3%)	1.5	20 (2%)	1.2	28 (3%)	1.6	31 (4%)	1.7	23 (3%)	1.2	
<b>Total</b>	<b>894 (100%)</b>	<b>8.9</b>	<b>816 (100%)</b>	<b>8.1</b>	<b>806 (100%)</b>	<b>8.0</b>	<b>798 (100%)</b>	<b>8.0</b>	<b>843 (100%)</b>	<b>8.5</b>	

\*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, 2005-2009



Lighter outside bars = Not MSM, includes male and female

Darker inside bars = MSM, includes MSM/IDU

Percentages to the left or right of the bars indicate the percentage of black, white, or other race cases in each age group.

## New HIV diagnoses by race/sex

The rate of new diagnoses increased among black males (average 3% per year) between 2005 and 2009. This is the fourth consecutive trend report showing increases in this group. The rate decreased among black females (average 5% per year) for the second consecutive report. There was also a decrease among white females (average 7% per year) and an overall decrease in rate among females of 11% per year. There was a decrease among whites for the second consecutive report (average 5% per year). Diagnosis rates remain highest among blacks of both sexes compared to all other race/sex groups. In 2009, the rate among black males was over 10 times that of white males, and the rate among black females was 37 times that of white females. Although there was a statistically significant decrease in rate among white males in the previous report, there was no decrease in this subgroup in the current report. Rates among those of other race also remained stable.

Table 2.† New HIV diagnoses by race/sex, 2005-2009

Race/Sex	Year of diagnosis									
	2005		2006		2007		2008		2009	
	Num (%)	Rate	Num (%)	Rate	Num (%)	Rate	Num (%)	Rate	Num (%)	Rate
<b>Male</b>	672 (75%)	13.5	623 (76%)	12.5	620 (77%)	12.5	625 (78%)	12.7	672 (80%)	13.7
Black	374 (42%)	55.7	359 (44%)	53.6	356 (44%)	53.3	387 (48%)	58.5	406 (48%)	61.7 ↑ 3%
White	246 (28%)	6.3	218 (27%)	5.6	206 (26%)	5.4	185 (23%)	4.8	220 (26%)	5.8
Other	51 (6%)	12.4	45 (6%)	10.7	58 (7%)	13.7	54 (7%)	12.4	46 (6%)	10.6
<b>Female</b>	222 (25%)	4.3	194 (24%)	3.8	185 (23%)	3.6	172 (22%)	3.4	171 (20%)	3.4 ↓ 7%
Black	164 (18%)	21.9	144 (18%)	19.2	139 (17%)	18.7	119 (15%)	16.1	136 (16%)	18.5 ↓ 5%
White	44 (5%)	1.1	32 (4%)	0.8	31 (4%)	0.8	39 (5%)	1.0	21 (2%)	0.5 ↓ 11%
Other	14 (2%)	3.6	18 (2%)	4.5	15 (2%)	3.7	15 (2%)	3.7	14 (2%)	3.4
<b>All</b>	894 (100%)	8.9	816 (100%)	8.1	806 (100%)	8.0	798 (100%)	8.0	843 (100%)	8.5
Black	539 (60%)	37.9	503 (62%)	35.5	494 (61%)	35.1	505 (63%)	36.1	541 (64%)	38.9
White	290 (32%)	3.7	250 (31%)	3.2	238 (29%)	3.0	223 (28%)	2.9	241 (29%)	3.1 ↓ 5%
Other	65 (7%)	8.1	63 (8%)	7.7	73 (9%)	8.8	69 (9%)	8.1	61 (7%)	7.0

†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 2005 and 2009, the number of newly diagnosed persons who were injecting drug users (IDU) decreased by an average of 20% per year. There was also a decrease among MSM/IDU (11% per year) (Table 3). The number also decreased among persons who were infected through heterosexual sex by an average of 7% per year, the second consecutive trend report to show a decrease in this risk group. The decrease among IDU has occurred in the past 6 trend reports. Data from Michigan's HIV Behavioral Surveillance (collected in 2005) suggest reductions among IDUs may be partly attributable to the success of harm reduction programs, such as needle exchange.

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.

Newly diagnosed persons with no identified risk (NIR) include 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 identified. Although they account for about 28% of all diagnoses each year, NIRs make up 17% of all persons living with HIV in MI regardless of year of diagnosis.

Figure 3 illustrates trends among MSM by race. MSM were 47% of all new diagnoses between 2005 and 2009. Of these newly diagnosed MSM, 54% are black while 38% are white. The number of black MSM cases increased significantly for the fifth consecutive trend report. The number of white MSM cases decreased significantly for the third consecutive trend report.

Table 3.\* New HIV diagnoses by risk, 2005-2009

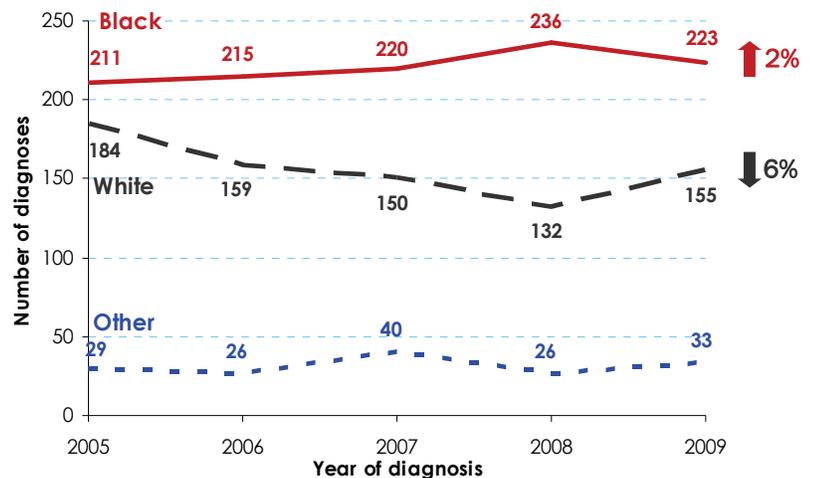
Risk	Year of diagnosis				
	2005	2006	2007	2008	2009
	Num (%)				
MSM	400 (45%)	382 (47%)	396 (49%)	374 (47%)	398 (47%)
IDU	64 (7%)	47 (6%)	49 (6%)	32 (4%)	24 (3%)
MSM/IDU	24 (3%)	18 (2%)	14 (2%)	20 (3%)	13 (2%)
Heterosexual	170 (19%)	148 (18%)	161 (20%)	116 (15%)	133 (16%)
Other known	4 (0%)	4 (0%)	3 (0%)	4 (1%)	2 (0%)
No identified risk	231 (26%)	218 (27%)	182 (23%)	251 (31%)	273 (32%)
<b>Total</b>	<b>894 (100%)</b>	<b>816 (100%)</b>	<b>806 (100%)</b>	<b>798 (100%)</b>	<b>843 (100%)</b>

↓ 20%  
↓ 11%  
↓ 7%

\*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 and females categorized as "high-risk" heterosexuals (persons who knew they had one or more partners that were an IDU, bisexual (for females), a recipient of HIV infected blood, or a person infected with HIV) as well as females who reported sex with males of unknown risk/HIV status as their only 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, 2005-2009



## Concurrent HIV and AIDS diagnoses

The proportion of persons diagnosed with concurrent diagnoses decreased significantly overall from 32% in 2005 to 19% in 2009 (Table 4). Similarly, there were significant decreases in the proportion of concurrent diagnoses among all males as well as males of black and white race. There were also significant decreases in the proportion of concurrent diagnoses in females and females of black and other races. The proportion decreased in all three race groups overall.

Persons of white and other race had significantly higher proportions of concurrent diagnoses (28% and 30%, respec-

(Continued on page 5)

(Continued from page 4)

## Concurrent HIV and AIDS diagnoses (cont.)

tively) compared to those of black race (23%). This may suggest earlier and more frequent testing among black individuals.

Most 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, 2005-2009

Race/Sex	Year of diagnosis					Total Num (%)	
	2005 Num (%)	2006 Num (%)	2007 Num (%)	2008 Num (%)	2009 Num (%)		
<b>Male</b>	211 (31%)	177 (28%)	160 (26%)	147 (23%)	132 (20%)	828 (26%)	↓ 11%
Black	109 (29%)	100 (28%)	77 (22%)	73 (19%)	74 (18%)	433 (23%)	↓ 11%
White	82 (33%)	60 (28%)	68 (33%)	56 (30%)	46 (21%)	312 (29%)	↓ 12%
Other	20 (39%)	17 (38%)	14 (24%)	18 (33%)	12 (26%)	81 (32%)	
<b>Female</b>	72 (32%)	45 (23%)	40 (22%)	31 (18%)	27 (16%)	215 (23%)	↓ 16%
Black	51 (31%)	36 (25%)	29 (21%)	24 (20%)	23 (17%)	163 (23%)	↓ 14%
White	15 (34%)	2 (6%)	9 (29%)	4 (10%)	4 (19%)	34 (20%)	
Other*	6 (43%)	7 (39%)	2 (13%)	3 (20%)	0 ---	18 (23%)	↓ 23%
<b>All</b>	283 (32%)	222 (27%)	200 (25%)	178 (22%)	159 (19%)	1043 (25%)	↓ 13%
Black	160 (30%)	136 (27%)	107 (22%)	97 (19%)	96 (18%)	597 (23%)	↓ 12%
White	97 (33%)	62 (25%)	77 (33%)	60 (27%)	50 (21%)	347 (28%)	↓ 12%
Other	26 (40%)	24 (38%)	16 (22%)	21 (31%)	12 (20%)	100 (30%)	↓ 20%

\*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 2005 to 2009, which do not take into account the fluctuations from year to year.
- \*There were no concurrent cases for Females of other race in 2009, so trend is for 2005-2008.

## New HIV diagnoses by residence at diagnosis

The rate and number of new HIV diagnoses remained stable in SE Michigan (Wayne, Oakland, Macomb, Monroe, Lapeer and St. Clair counties) and the rest of the state ("Out-State") (Table 5). In the last trend report, the *rate* remained stable in SE Michigan while the *number* decreased. Both regions continue to experience a population decline, which may explain the decrease in the number of new diagnoses. These population shifts may be affecting rates in some areas, although there is no concrete evidence for this relationship. Overall, about two-thirds of new diagnoses are among residents of SE Michigan.

Table 5.\* New HIV diagnoses by residence at diagnosis

Residence	Year of diagnosis									
	2005		2006		2007		2008		2009	
	Num (%)	Rate								
SE Michigan	604 (68%)	13.5	552 (68%)	12.4	550 (68%)	12.4	543 (68%)	12.4	575 (68%)	13.2
Out-state	290 (32%)	5.2	264 (32%)	4.7	256 (32%)	4.5	255 (32%)	4.5	268 (32%)	4.8
<b>Total</b>	<b>894 (100%)</b>	<b>8.9</b>	<b>816 (100%)</b>	<b>8.1</b>	<b>806 (100%)</b>	<b>8.0</b>	<b>798 (100%)</b>	<b>8.0</b>	<b>843 (100%)</b>	<b>8.5</b>

\*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

- Despite a decrease first observed in the last trend report, the number and rate of new diagnoses in Michigan remained stable between 2005 and 2009 at an average of 831 new cases per year and an average rate of 8.2.
- The highest rates of new HIV diagnoses occurred among:
  - 20 - 44 year olds
  - Black males and females
  - Men who have sex with men (MSM)\*
  - Southeast Michigan residents
- INCREASES in rates occurred among:
  - 13 - 19 year olds (sixth consecutive trend report)
  - 20 - 24 year olds
  - Black males
  - Black MSM\*
- DECREASES in rates occurred among:
  - 25 - 49 year olds
  - Black females, white females, and females
  - Whites overall
  - White MSM\*
  - Injecting drug users (sixth consecutive trend report), MSM/IDU, and persons heterosexually infected (second consecutive trend report)\*
- While over two thirds of Michigan cases are in Southeast (SE) Michigan, nearly three fourths of Michigan's new cases among 13 - 19 year olds are SE Michigan residents (47% are Detroit residents and 25% reside in other parts of SE Michigan).
- 85% of new 13 - 19 year old cases are black (of whom just under three quarters 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 campaigns.
- Decreases in concurrent diagnoses occurred overall as well as among several subgroups: black males, white males, males overall, black females, other females, and females overall. Decreases also occurred in all three race groups. This is the third consecutive trend report to reflect broad decreases in concurrent diagnoses, suggesting improvements in early case detection. This may be due to increased and earlier testing.

\*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

(313) 876-0353  
(517) 335-8165

([www.michigan.gov/hivstd](http://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](http://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/](http://www.who.int/topics/hiv_infections/en/)  
*HIV/AIDS Global Resources*