

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

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

Overall trends in new HIV diagnoses in SE Michigan

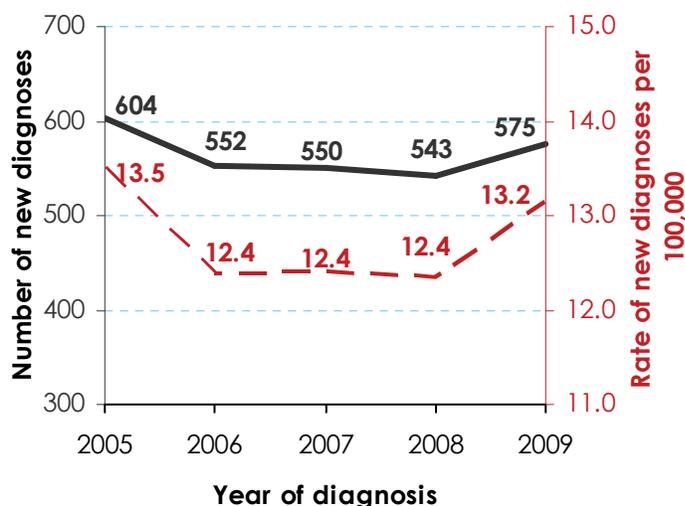
METHODS. To evaluate trends in new HIV diagnoses in Southeast Michigan (Lapeer, Macomb, Monroe, St. Clair, Oakland, and Wayne counties) over time, we estimated the number of persons newly diagnosed with HIV infection from 2005 through 2009 by adjusting the number of reported cases to account for those 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, 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 in SE Michigan, 2005–2009



OVERVIEW OF TRENDS. Between 2005 and 2009, the rate of new HIV diagnoses in Southeast Michigan remained stable, with an average rate of 12.8 (Figure 1). The number of new diagnoses also remained stable at an average of 565 cases per year. In the previous trend report, SE Michigan experienced a significant decrease in number of new diagnoses for the first time.

Each year, there are more new diagnoses of HIV infection than deaths. As a result, the reported number of persons living with HIV/AIDS in Michigan is increasing. MDCH estimates that 12,400 people were living with HIV infection in SE Michigan (including those with AIDS) as of January 2010. This number is almost two-thirds of all new cases in Michigan.

New HIV diagnoses by age at diagnosis

The rate of new diagnoses increased significantly among persons 13-19 years of age (average increase in rate of 18% per year) for the sixth consecutive trend report. The rate also increased among 20-24 and 25-29 year olds (11% and 6% per year, respectively) (Table 1). The rate decreased significantly among persons aged 30-39 and 45-49 years. Rates in all other age groups were stable. While the largest number and highest rates of new diagnoses remain among 20-44 year olds, increases in teens and young adults continue to occur while rates in older age groups decrease or remain stable.

Table 1.† New HIV diagnoses by age at diagnosis, SE MI, 2005-2009

Age at diagnosis	Year of diagnosis										
	2005		2006		2007		2008		2009		
	Num (%)	Rate									
0 - 12 yrs	1 (0%)	0.1	3 (1%)	0.4	2 (0%)	0.3	3 (1%)	0.4	2 (0%)	0.3	
13 -19 yrs	31 (5%)	6.9	37 (7%)	8.2	54 (10%)	12.1	59 (11%)	13.2	61 (11%)	13.9	↑18%
20 -24 yrs	74 (12%)	28.4	75 (14%)	29.6	76 (14%)	30.2	92 (17%)	36.9	108 (19%)	42.9	↑11%
25 -29 yrs	73 (12%)	25.2	69 (13%)	23.6	64 (12%)	22.3	73 (13%)	25.9	87 (15%)	32.0	↑6%
30 -34 yrs	88 (15%)	28.7	65 (12%)	22.4	57 (10%)	20.5	57 (10%)	20.7	48 (8%)	17.6	↓10%
35 -39 yrs	83 (14%)	25.2	88 (16%)	26.8	71 (13%)	22.1	69 (13%)	21.9	65 (11%)	21.4	↓5%
40 -44 yrs	93 (15%)	26.2	80 (15%)	23.1	81 (15%)	23.8	58 (11%)	17.6	68 (12%)	21.3	
45 -49 yrs	71 (12%)	19.6	61 (11%)	16.9	58 (11%)	16.3	54 (10%)	15.3	42 (7%)	12.1	↓10%
50 -54 yrs	50 (8%)	15.8	35 (6%)	10.8	42 (8%)	12.7	36 (7%)	10.5	55 (9%)	15.9	
55 -59 yrs	24 (4%)	9.0	22 (4%)	7.8	18 (3%)	6.5	19 (4%)	6.8	27 (5%)	9.2	
60 and over	15 (2%)	2.1	15 (3%)	2.0	25 (5%)	3.3	23 (4%)	3.0	12 (2%)	1.6	
Total	604 (100%)	13.5	552 (100%)	12.4	550 (100%)	12.4	543 (100%)	12.4	575 (100%)	13.2	

†TABLE FOOTNOTES:

- The number of new diagnoses are estimates based on the number of reported cases adjusted to account for reporting delay. As a result, summed counts will not always match the column total due to rounding error.
- **Bold/Colored text** indicates statistically significant trends for 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 race/sex

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

Race/Sex	Year of diagnosis										
	2005		2006		2007		2008		2009		
	Num (%)	Rate									
Male	445 (74%)	20.5	414 (75%)	19.0	418 (76%)	19.4	413 (76%)	19.3	456 (79%)	21.4	
Black	302 (50%)	64.1	268 (49%)	57.0	289 (53%)	61.9	295 (54%)	63.8	314 (55%)	68.1	
White	117 (19%)	7.7	123 (22%)	8.1	97 (18%)	6.4	84 (16%)	5.7	117 (20%)	7.9	
Other	26 (4%)	14.1	23 (4%)	12.2	32 (6%)	16.8	33 (6%)	17.3	25 (4%)	12.6	
Female	158 (26%)	6.9	139 (25%)	6.1	132 (24%)	5.8	130 (24%)	5.8	119 (21%)	5.3	↓6%
Black	125 (21%)	22.8	113 (21%)	20.7	111 (20%)	20.3	100 (19%)	18.6	102 (18%)	18.9	
White	27 (4%)	1.7	14 (3%)	0.9	15 (3%)	1.0	19 (4%)	1.3	10 (2%)	0.7	↓15%
Other	6 (1%)	3.4	11 (2%)	6.1	6 (1%)	3.3	10 (2%)	5.5	7 (1%)	3.8	
All	604 (100%)	13.5	552 (100%)	12.4	550 (100%)	12.4	543 (100%)	12.4	575 (100%)	13.2	
Black	427 (71%)	41.9	382 (69%)	37.5	400 (73%)	39.5	396 (73%)	39.4	416 (72%)	41.6	
White	144 (24%)	4.7	137 (25%)	4.5	112 (20%)	3.7	103 (19%)	3.4	128 (22%)	4.3	
Other	32 (5%)	8.8	34 (6%)	9.2	38 (7%)	10.2	44 (8%)	11.5	32 (6%)	8.3	

†TABLE FOOTNOTES:

- The number of new diagnoses are estimates based on the number of reported cases adjusted to account for reporting delay. As a result, summed counts will not always match the column total due to rounding error.
- **Bold/Colored text** indicates statistically significant trends for 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 **race/sex** (cont.)

The rate of new diagnoses decreased among white females and females overall, with an average annual decrease in rate of 15% and 6%, respectively (Table 2). The rate of new HIV diagnoses is consistently highest among those of black race. In 2009, the rate of new diagnoses among blacks was 9.7 times higher than that of whites. The rate of new diagnoses for black males was 8.6 times higher than that of white males. The disparity is even more pronounced among females, with the rate among blacks 27 times that of whites. While the rates among persons of other race are lower than those among blacks, they are almost twice as high as those of whites. In particular, the rate among women of other race was 5.4 times the rate among white females in 2009. Other race is composed of Hispanics, Asian Hawaiian/Pacific Islander, American Indian/Alaska Native, multiracial persons, and those of unknown or other race. Hispanics make up 49% of this group. These racial disparities are not unique to SE Michigan. Statewide and nationwide, communities of color continue to be disproportionately affected by HIV.

New HIV diagnoses by **risk**

The number of newly diagnosed persons who were injecting drug users (IDU) decreased by an average of 19% per year. The number also decreased among persons who were infected through heterosexual sex by an average of 6% per year (Table 3).

This is the sixth consecutive report showing significant decreases in injecting drug use as a risk behavior. Data from Michigan's HIV Behavioral

Surveillance, which focused on IDUs living in Detroit (collected in 2005), suggest the trend may be partly attributed to the success of harm reduction programs like needle exchange. This is also the second consecutive report showing decreases among people infected through heterosexual sex. This may be a result of the significant decrease among females, as females represent 87% of heterosexual infections in Southeast Michigan.

Table 3.^s New HIV diagnoses by risk, SE MI, 2005-2009

Risk	Year of diagnosis					
	2005	2006	2007	2008	2009	
	Num (%)					
MSM	259 (43%)	263 (48%)	256 (47%)	256 (47%)	264 (46%)	
IDU	48 (8%)	33 (6%)	38 (7%)	20 (4%)	21 (4%)	↓ 19%
MSM/IDU	12 (2%)	11 (2%)	6 (1%)	12 (2%)	8 (1%)	
Heterosexual	114 (19%)	98 (18%)	111 (20%)	87 (16%)	91 (16%)	↓ 6%
Other known	2 (0%)	3 (1%)	2 (0%)	3 (1%)	1 (0%)	
No identified risk	168 (28%)	144 (26%)	137 (25%)	164 (30%)	191 (33%)	
Total	604 (100%)	552 (100%)	550 (100%)	543 (100%)	575 (100%)	

TABLE FOOTNOTES:

- The number of new diagnoses are estimates based on the number of reported cases adjusted to account for reporting delay. As a result, summed counts will not always match the column total 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 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.

New HIV diagnoses by **residence at diagnosis**

The rate of new diagnoses decreased in the City of Detroit for the third consecutive trend report. Rates remained stable in other areas of Southeast Michigan (Table 4). The population of the city of Detroit, and Southeast MI overall, continues to decline. It is possible that these changes in numbers and rates are related to population shifts, but there is no concrete evidence regarding the relationship between population shifts and rates of HIV diagnoses. Regardless of the decrease, residents of Detroit represent 55% of SE Michigan's and 38% of the state's new HIV cases. The rate of new diagnoses in Detroit remains the highest of any location, and it is almost three times as high as Oakland County, the location with the second highest rate in Michigan.

Table 4.† New HIV Diagnoses‡ by residence at diagnosis, SE MI, 2005-2009

Residence	Year of diagnosis										
	2005		2006		2007		2008		2009		
	Num (%)	Rate									
Detroit	361 (60%)	39.2	299 (54%)	32.6	302 (55%)	32.9	304 (56%)	33.4	295 (51%)	32.4	↓ 4%
Oakland Co.	114 (19%)	9.5	114 (21%)	9.5	88 (16%)	7.3	91 (17%)	7.6	133 (23%)	11.0	
Wayne Co. (excl Detroit)	80 (13%)	7.3	81 (15%)	7.5	111 (20%)	10.4	88 (16%)	8.5	87 (15%)	8.6	
Macomb Co.	33 (5%)	4.0	45 (8%)	5.5	40 (7%)	4.9	47 (9%)	5.6	53 (9%)	6.3	
St. Clair Co.	10 (2%)	5.9	4 (1%)	2.4	4 (1%)	2.4	6 (1%)	3.6	3 (1%)	1.8	
Monroe Co.	3 (0%)	2.0	5 (1%)	3.3	4 (1%)	2.6	4 (1%)	2.6	3 (1%)	2.0	
Lapeer Co.	2 (0%)	---	3 (1%)	---	1 (0%)	---	2 (0%)	---	1 (0%)	---	
Total	604 (100%)	13.5	552 (100%)	12.4	550 (100%)	12.4	543 (100%)	12.4	575 (100%)	13.2	

†TABLE FOOTNOTES:

- The number of new diagnoses are estimates based on the number of reported cases 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.
- Rates are per 100,000 population. Rates are not reliable for <10 cases.

Concurrent HIV and AIDS Diagnoses

The proportion of persons diagnosed with AIDS within 30 days of HIV diagnosis ("concurrent") decreased significantly from 32% in 2005 to 20% in 2009 (Table 5). Similarly, there were significant decreases in the proportion of concurrent diagnoses among all males (32% in 2005 to 20% in 2009), driven by significant decreases among black males (30% in 2005 to 19% in 2009). This is the third report showing significant among all males. Decreases also occurred among black and white females and females overall for the first time.

Table 5.† Concurrent HIV diagnoses by race/sex group, SE MI, 2005-2009

Race/Sex	Year of diagnosis					Total	
	2005	2006	2007	2008	2009		
	Num (%)	Num (%)	Num (%)	Num (%)	Num (%)		
Male	142 (32%)	131 (32%)	106 (25%)	95 (23%)	93 (20%)	567 (26%)	↓ 12%
Black	92 (30%)	83 (31%)	64 (22%)	58 (20%)	61 (19%)	358 (24%)	↓ 11%
White	38 (32%)	40 (33%)	35 (36%)	27 (32%)	27 (23%)	167 (31%)	
Other	12 (46%)	8 (35%)	6 (19%)	10 (30%)	6 (25%)	42 (30%)	
Female	53 (34%)	37 (27%)	26 (20%)	25 (19%)	22 (18%)	163 (24%)	↓ 16%
Black	38 (30%)	31 (27%)	23 (21%)	22 (22%)	19 (19%)	134 (24%)	↓ 11%
White	12 (44%)	1 (7%)	2 (13%)	1 (5%)	2 (20%)	18 (21%)	↓ 24%
Other	3 (50%)	5 (45%)	1 (17%)	2 (20%)	0	11 (28%)	
All	195 (32%)	168 (30%)	132 (24%)	120 (22%)	115 (20%)	731 (26%)	↓ 12%
Black	130 (30%)	114 (30%)	87 (22%)	80 (20%)	80 (19%)	492 (24%)	↓ 11%
White	50 (35%)	41 (30%)	37 (33%)	28 (27%)	29 (22%)	185 (30%)	↓ 13%
Other	15 (47%)	13 (38%)	7 (18%)	12 (28%)	6 (19%)	53 (30%)	↓ 28%

†TABLE FOOTNOTES:

- The number of new diagnoses are estimates based on the number of reported cases adjusted to account for reporting delay. As a result, summed counts will not always match the column total 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 significant decreases in concurrent diagnoses among all race groups. These widespread decreases among several race/sex subgroups, as well as overall, suggest earlier and more frequent testing. The proportion of cases that are concurrent has decreased significantly for three consecutive trend reports.

Summary

- Between 2005 and 2009, the number and rate of new diagnoses in Southeast Michigan remained stable at an average of 565 cases per year and an average rate of 12.8.
- The highest rates of new HIV diagnoses occurred among:
 - 20 - 44 year olds
 - Black males and females and blacks overall
 - Men who have sex with men (MSM)*
 - Detroit residents
- INCREASES in rates occurred among:
 - 13 - 19 year olds (sixth consecutive trend report); the rate of new diagnoses among this group more than doubled from 2005 to 2009
 - 20 - 24 and 25 - 29 year olds
- DECREASES in rates occurred among:
 - 30 - 34, 35 - 39, and 45 - 49 year olds
 - White females and females overall
 - Injection drug users (sixth consecutive trend report) and heterosexuals*
 - Detroit residents (third consecutive trend report)
- Race and sex disparities in rates of new HIV diagnoses remain. Comparing the diagnosis rates of blacks and whites in 2009:
 - **Overall:** The rate for blacks was 9.7 times higher
 - **Males:** The rate for blacks was 8.6 times higher
 - **Females:** The rate for blacks was 27 times higher
- Comparing the diagnosis rates of persons of other race and whites in 2009:
 - **Females:** The rate for persons of other race was 5.4 times higher
- The proportion of all concurrent diagnoses decreased significantly from 32% in 2005 to 20% in 2009.
- Concurrent diagnoses also decreased among black males, all males, black females, white females, all females, and all race groups. This is the third consecutive trend report showing decreases among all males and overall.

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

For more information:

Michigan Department of Community Health HIV/AIDS Surveillance Program

(313) 876-0353
(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