

ANNUAL REVIEW OF HIV TRENDS IN SE MICHIGAN (2003 - 2007)

Bureau of Epidemiology, HIV/STD/VH/TB Epidemiology Section
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Overall trends in new HIV diagnoses in SE Michigan

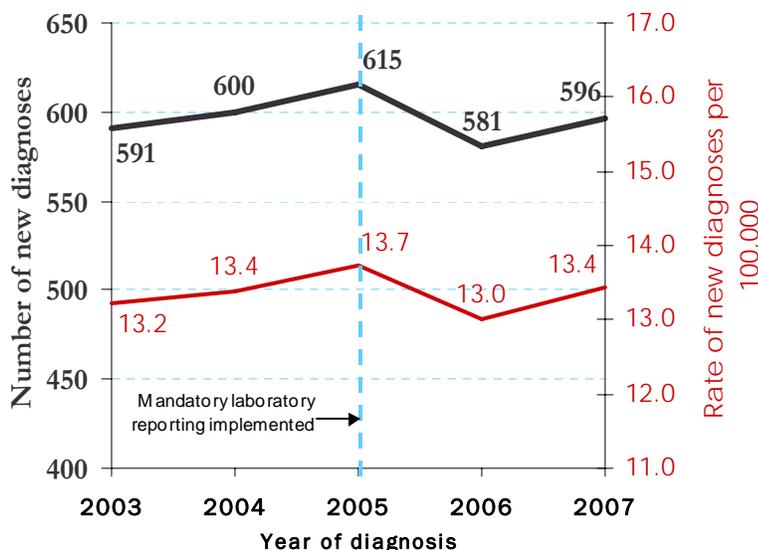
METHODS. To evaluate trends over time, we estimated the number of persons newly diagnosed with HIV infection each year in Southeast (SE) Michigan (Wayne, Oakland, Macomb, Monroe, Lapeer and St. Clair counties) by adjusting the number of reported cases diagnosed from 2003 through 2007 to account for those who may not have been reported to the health department by January 1, 2009. These adjustments were calculated by weighting the data.

In this report, “significant” indicates statistical significance assessed at $p < 0.05$. We used regression modeling on the adjusted data to assess significant changes between 2003 and 2007 in annual rates of new diagnoses overall and by race, sex, and age. For risk groups, we analyzed annual counts rather than rates since there are no reliable denominator data available to allow rate calculation. Trends overall and in subgroups are described using average annual percent changes in rates (or annual counts) of new diagnoses, and only significant trends and the corresponding percent changes are shown. Rates of new diagnoses are all calculated using intercensal annual population estimates released by the Census Bureau in 2007, the most recent year for which demographic breakdowns are available. All rates in this report are rates per 100,000 population. For concurrent diagnoses, we used the Chi Square Mantel-Haenszel test for trend to test for trends over time. This test allows us to assess increases and decreases in the proportion of concurrent diagnoses, while taking into account the total number of diagnoses for a particular race/sex/year 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. Last year MDCH released our 2006 incidence estimates, which measured new *infections* rather than *new diagnoses* using the Serologic Testing Algorithm for Recent HIV Seroconversion (STARHS). We will supplement this report with these incidence data once they are available for multiple years.

OVERVIEW OF TRENDS. Between 2003 and 2007, the rate of new HIV diagnoses remained stable (13.2 per 100,000 in 2003 and 13.4 per 100,000 in 2007). The number of new diagnoses likewise remained stable, from 591 in 2003 to 596 in 2007, averaging 597 new diagnoses (13.4 per 100,000) per year. The rate peaked at 13.7 per 100,000 in 2005, and is likely due to the implementation of mandatory laboratory reporting in 2005, instead of reflective of a true increase in the number of new diagnoses that year (Fig 1). Prior to this, the HIV Surveillance Program in Michigan relied on a few laboratories who voluntarily reported positive HIV-related tests and health care providers, who are required by law to report positive cases.

Figure 1. Number and rate of new HIV diagnoses in SE Michigan, 2003–2007



The rate peaked at 13.7 per 100,000 in 2005, and is likely due to the implementation of mandatory laboratory reporting in 2005, instead of reflective of a true increase in the number of new diagnoses that year (Fig 1). Prior to this, the HIV Surveillance Program in Michigan relied on a few laboratories who voluntarily reported positive HIV-related tests and health care providers, who are required by law to report positive cases.

The new HIV diagnoses described in this report include persons diagnosed with HIV, non-AIDS as well as those who learned of their HIV infection status after developing symptoms of AIDS. Each year, there are more new diagnoses of HIV infection than deaths. Therefore, the reported number of persons living with HIV/AIDS in Michigan is increasing. MDCH estimates that 11,990 residents are living with HIV infection in SE Michigan (including those with AIDS). This number is two-thirds of all cases in Michigan.

New HIV diagnoses by age at diagnosis

Between 2003 and 2007, the rate of new diagnoses increased significantly among persons 13-19 years of age (average increase in rate of 23% per year) and persons 60 years or older (average increase in rate of 16% per year). The rate decreased significantly among persons aged 25-29, 35-39, and 55-59 (Table 1). Rates in all other ages groups were stable.

This is the fourth consecutive trend report showing significant increases in new diagnoses among 13-19 year olds, and the second consecutive trend report showing significant increases in new diagnoses among persons 60 years or older. This is the first report in the last four years to *not* show significant increases among 20-24 year olds. Public testing data indicate the volume of testing remained constant over the years for all age groups. However, there appears to be an increase in the number of *positive tests* among teens and adolescents. The increase in new diagnoses among persons 60 or older may be due to the low rates of new diagnoses in this group, which makes them less robust against small changes over time. Although these trends are alarming and demand action, it is important to remember that the largest number and highest rates of new diagnoses continue to be among 35-44 year olds, followed closely by 20-34 year olds.

Table 1.† New HIV diagnoses by age at diagnosis

Age at diagnosis	Year of diagnosis									
	2003		2004		2005		2006		2007	
	Num (Pct)	Rate	Num (Pct)	Rate	Num (Pct)	Rate	Num (Pct)	Rate	Num (Pct)	Rate
0-12 years	4(1%)	0.5	2(0%)	0.2	1(0%)	0.1	4(1%)	0.5	2(0%)	0.3
13-19 years	24(4%)	5.5	27(5%)	6.0	30(5%)	6.7	36(6%)	7.8	55(9%)	12.2 ↑23%
20-24 years	68(12%)	25.9	91(15%)	35.0	76(12%)	29.0	75(13%)	28.9	82(14%)	31.7
25-29 years	73(12%)	26.7	74(12%)	27.5	73(12%)	27.2	71(12%)	26.9	66(11%)	25.2 ↓2%
30-34 years	77(13%)	23.2	80(13%)	24.9	88(14%)	28.5	70(12%)	24.3	60(10%)	21.9
35-39 years	104(18%)	30.6	89(15%)	26.8	89(14%)	26.8	95(16%)	28.5	84(14%)	25.5 ↓4%
40-44 years	88(15%)	24.1	91(15%)	25.1	97(16%)	26.9	89(15%)	25.2	89(15%)	25.9
45-49 years	60(10%)	16.8	61(10%)	16.9	71(12%)	19.5	65(11%)	17.8	65(11%)	17.9
50-54 years	49(8%)	16.0	44(7%)	14.1	51(8%)	16.1	38(6%)	11.5	49(8%)	14.7
55-59 years	33(6%)	13.3	21(4%)	8.1	24(4%)	8.8	23(4%)	8.1	21(4%)	7.3 ↓9%
60 years +	11(2%)	1.5	18(3%)	2.5	16(3%)	2.2	15(3%)	2.1	24(4%)	3.1 ↑16%
Total	591(100%)	13.2	600(100%)	13.4	615(100%)	13.7	581(100%)	13.0	596(100%)	13.4

New HIV diagnoses by race/sex

The rate of new diagnoses remained stable among all race/sex groups between 2003 and 2007 (Table 2). In 2007,

Table 2.† New HIV diagnoses by race/sex

(Continued on page 3)

Race/sex	Year of diagnosis									
	2003		2004		2005		2006		2007	
	Num (%)	Rate								
Males	450 (76%)	20.7	438 (73%)	20.1	458 (74%)	21.0	436 (75%)	20.0	457 (77%)	21.1
Black	302 (51%)	63.7	293 (49%)	61.6	308 (50%)	64.8	279 (48%)	58.7	310 (52%)	65.5
White	132 (22%)	8.6	122 (20%)	8.0	126 (20%)	8.3	134 (23%)	8.9	117 (20%)	7.8
Other	16 (3%)	9.2	23 (4%)	12.9	24 (4%)	13.1	22 (4%)	11.9	30 (5%)	15.8
Females	141 (24%)	6.1	162 (27%)	7.0	157 (26%)	6.9	145 (25%)	6.4	139 (23%)	6.1
Black	115 (19%)	20.9	141 (24%)	25.6	125 (20%)	22.6	121 (21%)	21.9	116 (19%)	21.0
White	14 (2%)	0.9	13 (2%)	0.8	27 (4%)	1.7	14 (2%)	0.9	17 (3%)	1.1
Other	12 (2%)	7.2	7 (1%)	4.1	5 (1%)	2.9	10 (2%)	5.7	6 (1%)	3.4
All	591 (100%)	13.2	600 (100%)	13.4	615 (100%)	13.7	581 (100%)	13.0	596 (100%)	13.4
Black	417 (71%)	40.7	434 (72%)	42.2	433 (70%)	42.1	400 (69%)	38.9	426 (71%)	41.5
White	146 (25%)	4.7	135 (23%)	4.4	153 (25%)	5.0	149 (26%)	4.8	134 (22%)	4.4
Other	28 (5%)	8.3	30 (5%)	8.6	29 (5%)	8.1	33 (6%)	8.9	36 (6%)	9.8

†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. Rates are not reliable for <10 cases.

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New HIV diagnoses by *race/sex* (cont.)

the rate of new HIV diagnoses remain highest among black males (65.5 per 100,000) and black females (21.0 per 100,000), with an overall rate for blacks of 41.5 per 100,000. In 2007, the rate of new diagnoses among blacks was 9.4 times higher than that of whites. The disparity in new diagnoses rates remains when looking at race/sex breakdowns. In 2007, the rate of new diagnoses for black males is 8.4 times higher than that of white males. The disparity is even more pronounced among females, with the rate among blacks being 19.9 times higher than that of white females. Rates for persons of Other race/ethnicity, though lower than the rates among blacks, are about twice as high as those of whites. The racial disparities we see are not unique to SE Michigan. Statewide and nationwide, communities of color continue to be disproportionately affected by HIV.

New HIV diagnoses by *risk*

Between 2003 and 2007, the number of new diagnoses among IDU decreased by an average of 9% per year (Table 3), whereas the number of new diagnoses among other risk groups have remained stable. Decreases among IDU have been noted in four consecutive trend reports.

Data from Michigan's HIV Behavioral Surveillance (collected in 2005), which focused on IDUs living in Detroit, suggest this decreasing trend can be partly be attributed to the success of harm reduction programs like needle exchange.

Table 3.^s New HIV diagnoses by risk

Risk	Year of diagnosis				
	2003	2004	2005	2006	2007
	Num (%)				
MSM	277 (47%)	262 (44%)	270 (44%)	274 (47%)	270 (45%)
IDU	55 (9%)	53 (9%)	48 (8%)	34 (6%)	42 (7%)
MSM/IDU	11 (2%)	14 (2%)	12 (2%)	11 (2%)	7 (1%)
Heterosexual	90 (15%)	107 (18%)	113 (18%)	92 (16%)	113 (19%)
Other known	5 (1%)	2 (0%)	2 (0%)	2 (0%)	2 (0%)
No identified risk	153 (26%)	161 (27%)	170 (28%)	169 (29%)	162 (27%)
Total	591 (100%)	600 (100%)	615 (100%)	581 (100%)	596 (100%)

↓9%

†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 un-

New HIV diagnoses by *residence at diagnosis*

This is the first time in the four years we have run trend reports that we have seen significant changes in the rates of new diagnoses in SE Michigan by residence at diagnosis (Table 4). Both Detroit's population and its rate of new HIV diagnoses decreased between 2003 and 2007, which may be due to HIV positive and negative people leaving at

Table 4.[‡] New HIV Diagnoses[‡] by residence at diagnosis

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Residence	Year of diagnosis									
	2003		2004		2005		2006		2007	
	Num (%)	Rate								
Detroit	362 (61%)	39.1	364 (61%)	39.4	370 (60%)	40.1	309 (53%)	33.7	322 (54%)	35.2
Oakland Co.	104 (18%)	8.6	94 (16%)	7.8	117 (19%)	9.7	121 (21%)	10.0	97 (16%)	8.1
Wayne Co. (excl. Detroit)	83 (14%)	7.4	100 (17%)	9.0	81 (13%)	7.3	88 (15%)	8.0	115 (19%)	10.8
Macomb Co.	33 (6%)	4.1	33 (6%)	4.0	31 (5%)	3.8	48 (8%)	5.8	49 (8%)	5.9
St. Clair Co.	4 (1%)	2.4	2 (0%)	1.2	11 (2%)	6.5	6 (1%)	3.6	4 (1%)	2.4
Monroe Co.	3 (1%)	2.0	3 (1%)	2.0	4 (1%)	2.6	5 (1%)	3.3	4 (1%)	2.7
Lapeer Co.	2 (0%)	2.2	3 (1%)	3.3	2 (0%)	2.2	4 (1%)	4.4	4 (1%)	4.6
Total	591 (100%)	13.2	600 (100%)	13.4	615 (100%)	13.7	581 (100%)	13.0	596 (100%)	13.4

†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. Rates are not reliable for <10 cases.

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New HIV diagnoses by *residence at diagnosis*

equal rates, so when the population decreased, the rate of new diagnoses decreased. In Macomb Co., one of the counties that experienced population increase during that period, the rate of new HIV diagnoses increased by an average of 13% per year. Oakland Co. had the most stable population between 2003 and 2007, and the rates of new diagnoses were stable during that period. The significant changes we see seem likely to be related to population shifts in Detroit and the surrounding counties, but we have no concrete evidence about the relationship between population shifts and rates of HIV diagnoses. Residents of Detroit represent 58% of SE Michigan's and 39% of the state's new HIV cases. Residents of Macomb Co. represent 7% of SE Michigan's and 4% of the state's new HIV cases.

Concurrent HIV and AIDS Diagnoses

The proportion of concurrent (within the same month) HIV and AIDS diagnoses decreased significantly from 29% in 2003 to 25% in 2007 (Table 5). Similarly, there were significant decreases in the proportion of concurrent diagnoses among all males (29% in 2003 to 22% in 2007). Although the decreases among females may seem larger than among males, the

smaller numbers of cases lead to greater fluctuations in the proportion of concurrent diagnoses each year. These fluctuations result in a non-significant trend over time among females.

Among all persons diagnosed with HIV between 2003 and 2007, the proportion of males concurrently diagnosed (26%) continues to be significantly higher than that of females (23%). There were no significant racial/ethnic differences in the proportion of concurrent diagnoses.

Most concurrent

diagnoses represent a failure to diagnose HIV early in the course of the person's infection as well as to start treatment early. Persons who are unaware of their HIV infection cannot benefit from antiretroviral therapy and have a poorer prognosis than those diagnosed early in the disease course. They are also not accessible for primary prevention (transmission to uninfected individuals). Expanding routine testing for HIV may improve outcomes for those who are infected.

Table 5.1 Concurrent HIV diagnoses in each race/sex group

Race/Sex	Year of diagnosis					Total Num (%)	
	2003 Num (%)	2004 Num (%)	2005 Num (%)	2006 Num (%)	2007 Num (%)		
Males	129 (29%)	117 (27%)	124 (27%)	115 (26%)	102 (22%)	588 (26%)	↓7% *
Black	83 (27%)	80 (27%)	80 (26%)	72 (26%)	67 (21%)	382 (26%)	
White	38 (29%)	31 (25%)	36 (29%)	37 (27%)	29 (25%)	171 (27%)	
Other	8 (50%)	6 (26%)	8 (33%)	6 (27%)	6 (21%)	34 (30%)	
Females	40 (28%)	30 (19%)	40 (26%)	31 (21%)	27 (20%)	168 (23%)	
Black	36 (31%)	27 (19%)	29 (23%)	26 (22%)	23 (20%)	142 (23%)	
White	2 (14%)	2 (15%)	9 (33%)	1 (7%)	3 (19%)	17 (20%)	
Other	2 (17%)	1 (14%)	2 (40%)	3 (30%)	1 (17%)	9 (23%)	
All	169 (29%)	147 (25%)	165 (27%)	146 (25%)	130 (22%)	756 (25%)	↓7% *
Black	119 (29%)	107 (25%)	109 (25%)	99 (25%)	90 (21%)	524 (25%)	
White	40 (27%)	33 (24%)	45 (30%)	38 (25%)	33 (24%)	188 (26%)	
Other	10 (36%)	7 (23%)	10 (34%)	9 (28%)	7 (20%)	44 (28%)	

†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 are counted as the number of concurrent diagnoses for a race/sex/year combination divided by the total diagnoses for that race/sex/year combination.
- Asterisk (*) indicates significant trends over the 5-year period occurred in a race/sex 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 percentage of concurrent diagnoses* from 2003 to 2007, which do not take into account the fluctuations between each year.

Summary

- Between 2003–2007, an average of 597 new HIV diagnoses (13.4 per 100,000) occurred each year.
- The highest rates of new HIV diagnoses occurred among:
 - 20 - 44 year olds
 - Black males and females
 - Males who have sex with males (MSM)*
 - Detroit residents
- INCREASES in rates occurred among:
 - 13 - 19 year olds (fourth consecutive trend report)
 - 60+ year olds (second consecutive trend report)
 - Macomb County residents
- DECREASES in rates occurred among:
 - 25 - 29 year olds, 35 - 39 year olds, and 55 - 59 year olds
 - Injection drug users (fourth consecutive trend report)*
 - Detroit residents
- Race and sex disparities in rates of new HIV diagnoses remain:
 - Comparing the diagnosis rates of blacks and whites in 2007:
 - **Overall:** The rate for blacks was 9.4 times higher
 - **Males:** The rate for blacks was 8.4 times higher
 - **Females:** The rate for blacks was 19.9 times higher
 - Comparing the diagnosis rates of persons of Other race/ethnicity and whites in 2007:
 - **Overall:** The rate for persons of Other race/ethnicity was 2.2 times higher
 - **Males:** The rate for persons of Other race/ethnicity was 2.0 times higher
 - **Females:** The rate for persons of Other race/ethnicity was 3.1 times higher
- 25% of persons newly diagnosed with HIV infection were also diagnosed with AIDS at the same time, indicating a detrimental delay in providing timely diagnosis and valuable medical treatment.

*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.michigan.gov/documents/resourceguide_6921_7.pdf

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