

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

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

METHODS. To evaluate trends over time, we estimated the number of persons newly diagnosed with HIV infection each year 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.

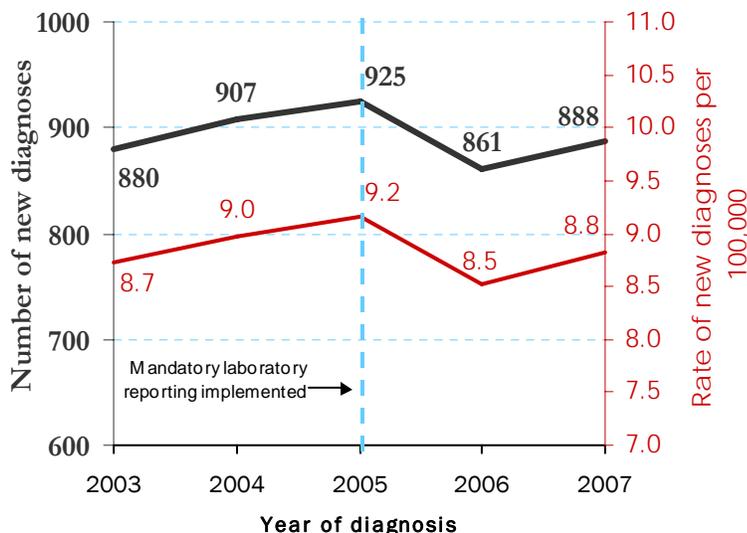
In this report, “significant” indicates statistical significance assessed at $p < 0.05$. We used regression modeling on the adjusted data to assess significant changes between 2003 and 2007 in annual rates of new diagnoses overall and by race, sex, and age. For risk groups, we analyzed annual counts 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 (8.7 per 100,000 in 2003 and 8.8 per 100,000 in 2007). The number of new diagnoses likewise remained stable, from 880 in 2003 to 888 in 2007, averaging 892 new diagnoses (8.8 per 100,000) per year. The rate peaked at 9.2 per 100,000 in

(Continued on page 2)

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



KEY FINDINGS

- This is the **4th consecutive** annual trend report showing an **increase** in new diagnoses among **teens**.
- **85%** of newly diagnosed **teens** are **black**, compared to 59% of those aged 20+. **Black MSM** were **62%** of these newly diagnosed teens.
- **Decreases** were noted among **IDUs** for the **4th consecutive** annual trend report.
- There were **increases** in new diagnoses among **black and Other race MSM**, and **decreases** among **white MSM**.

(Continued from page 1)

Overall trends in new HIV diagnoses (cont.)

2005, and is likely due to the implementation of mandatory laboratory reporting in 2005, instead of reflecting 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 18,200 residents are living with HIV infection in Michigan (including those with AIDS).

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 24% per year) and 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. 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. 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.

Of all teens diagnosed in the last five years, 85% are black compared to 59% of persons diagnosed at older ages. Furthermore, teens are much more likely to be black MSM compared to adults 20 years and older (62% vs. 22%) (Figure 2). This continues to underscore a need for prevention campaigns tailored to young black MSM, as the differences we have been seeing over the last four years in this young group will likely widen the already large racial gap among persons living with HIV.

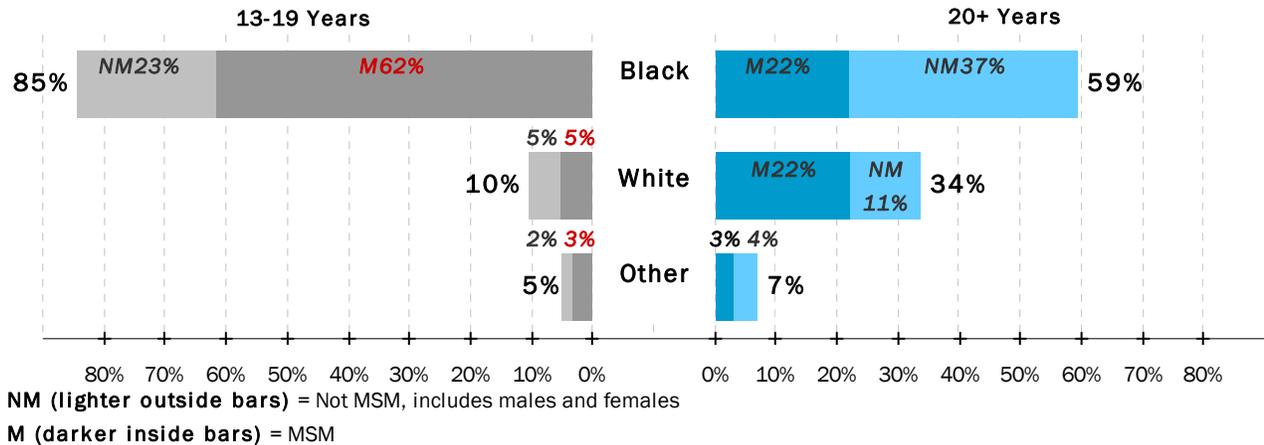
Table 1.† New HIV diagnoses by age at diagnosis

Age at diagnosis	Year of diagnosis									
	2003		2004		2005		2006		2007	
	Num (Pct)	Rate								
0-12 years	8 (1%)	0.4	4 (0%)	0.2	3 (0%)	0.2	5 (1%)	0.3	3 (0%)	0.2
13-19 years	33 (4%)	3.2	38 (4%)	3.7	43 (5%)	4.1	55 (6%)	5.3	75 (8%)	7.3 ↑ 24%
20-24 years	96 (11%)	13.7	132 (15%)	18.8	117 (13%)	16.8	108 (13%)	15.5	113 (13%)	16.5
25-29 years	106 (12%)	17.2	108 (12%)	17.3	111 (12%)	17.4	103 (12%)	15.8	109 (12%)	16.6 ↓ 2%
30-34 years	121 (14%)	17.4	139 (15%)	20.5	133 (14%)	20.4	107 (12%)	17.1	100 (11%)	16.6
35-39 years	164 (19%)	22.5	146 (16%)	20.5	132 (14%)	18.8	141 (16%)	20.0	123 (14%)	17.8 ↓ 5%
40-44 years	141 (16%)	17.6	135 (15%)	16.9	150 (16%)	19.2	141 (16%)	18.5	137 (15%)	18.5
45-49 years	91 (10%)	11.6	86 (10%)	10.8	104 (11%)	13.0	93 (11%)	11.5	97 (11%)	12.3
50-54 years	62 (7%)	9.1	58 (6%)	8.3	71 (8%)	9.9	55 (6%)	7.5	75 (8%)	10.1
55-59 years	37 (4%)	6.7	33 (4%)	5.7	34 (4%)	5.6	33 (4%)	5.1	27 (3%)	4.2 ↓ 10%
60 years +	20 (2%)	1.2	28 (3%)	1.7	27 (3%)	1.6	22 (3%)	1.3	27 (3%)	1.5
Total	880 (100%)	8.7	907 (100%)	9.0	925 (100%)	9.2	861 (100%)	8.5	888 (100%)	8.8

†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.

Figure 2. MSM vs. non-MSM risks by race/ethnicity and age at HIV diagnosis, 2003-2007



New HIV diagnoses by race/sex

The rate of new diagnoses increased among black males (average 1% per year), males of Other races (average 9% per year), and persons of Other races as a whole (average 8% per year). The rate decreased among white males (average 2% per year). The overall rates for males and females remained stable between 2003 and 2007 (Table 2). Diagnosis rates remain highest among blacks of both sexes, compared to all other race/sex groups.

The increases among males and all persons of Other races are driven by a combination of increases among Hispanics (who make up the majority of this group) as well as our increased ability to count persons as multi racial that began in 2006. Compared to blacks and whites, the number of cases among persons of Other race/ethnicity is relatively small. This group contains Hispanics, persons of multiple race, and other smaller racial groups. Because of these smaller numbers and combination of groups that comprise the Other category, increases in this group can show significant increases over a period of time whose meaning for the subgroups is difficult to discern.

Table 2.+ New HIV diagnoses by race/sex

Race/sex	Year of diagnosis									
	2003		2004		2005		2006		2007	
	Num (%)	Rate	Num (%)	Rate	Num (%)	Rate	Num (%)	Rate	Num (%)	Rate
Males	679 (77%)	13.7	673 (74%)	13.5	701 (76%)	14.1	662 (77%)	13.3	694 (78%)	14.0
Black	381 (43%)	56.5	370 (41%)	54.7	384 (42%)	56.9	380 (44%)	56.2	389 (44%)	57.8 ↑ 1%
White	263 (30%)	6.8	254 (28%)	6.5	267 (29%)	6.9	236 (27%)	6.1	243 (27%)	6.3 ↓ 2%
Other	34 (4%)	8.7	49 (5%)	12.2	50 (5%)	12.2	46 (5%)	10.8	61 (7%)	14.4 ↑ 9%
Females	201 (23%)	3.9	234 (26%)	4.6	224 (24%)	4.4	199 (23%)	3.9	194 (22%)	3.8
Black	155 (18%)	20.7	193 (21%)	25.6	165 (18%)	22.0	149 (17%)	19.8	146 (16%)	19.5
White	30 (3%)	0.8	30 (3%)	0.8	46 (5%)	1.2	35 (4%)	0.9	34 (4%)	0.8
Other	16 (2%)	4.3	11 (1%)	2.9	12 (1%)	3.1	16 (2%)	4.1	14 (2%)	3.5
All	880 (100%)	8.7	907 (100%)	9.0	925 (100%)	9.2	861 (100%)	8.5	888 (100%)	8.8
Black	537 (61%)	37.6	563 (62%)	39.4	549 (59%)	38.5	528 (61%)	37.0	535 (60%)	37.6
White	293 (33%)	3.7	284 (31%)	3.6	313 (34%)	4.0	271 (31%)	3.4	277 (31%)	3.5
Other	50 (6%)	6.5	60 (7%)	7.7	62 (7%)	7.8	62 (7%)	7.5	76 (9%)	9.1 ↑ 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.

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 suggest this can be attributed to the success of harm reduction programs like needle exchange.

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

The numbers of new diagnoses with no identified risk (NIR) remained stable between 2003 and 2007. This category includes males who reported sex with females of unknown risk/HIV status as their only risk, and males and females

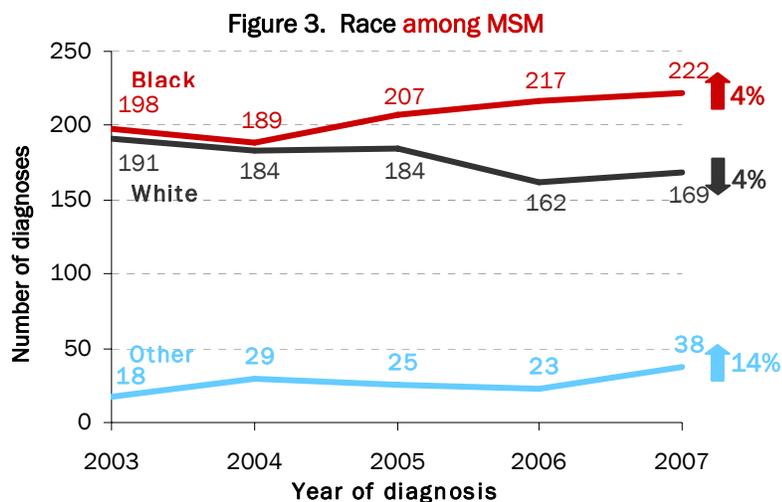
Table 3.† New HIV diagnoses by risk

Risk	Year of diagnosis				
	2003	2004	2005	2006	2007
MSM	407 (46%)	402 (44%)	416 (45%)	402 (47%)	429 (48%)
IDU	78 (9%)	65 (7%)	70 (8%)	46 (5%)	59 (7%)
MSM/IDU	20 (2%)	27 (3%)	25 (3%)	18 (2%)	16 (2%)
Heterosexual	144 (16%)	168 (18%)	171 (19%)	141 (16%)	165 (19%)
Other known	8 (1%)	4 (0%)	4 (0%)	3 (0%)	3 (0%)
No identified risk	222 (25%)	241 (27%)	239 (26%)	250 (29%)	217 (24%)
Total	880 (100%)	907 (100%)	925 (100%)	861 (100%)	888 (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 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.

↓9%



for whom no risk has yet been reported. Although they account for about 26% of all diagnoses each year, NIRs make up 17% of all persons living with HIV in MI regardless of year of diagnosis. This is expected, as time is needed to investigate recently diagnosed cases for risk information.

Figure 3 illustrates trends among MSM (46% of all new cases) by race/ethnicity. Fifty percent of MSM cases are black, and they continue to show an increasing trend. White MSM (43% of all MSM cases) show a decreasing trend. There was a significant increase of 14% among MSM of other races, who represent a very small number and proportion (6%) of all MSM.

Concurrent HIV and AIDS diagnoses

The proportion of concurrent (within 30 days) HIV and AIDS diagnoses decreased significantly from 27% in 2003 to 23% in 2007 (Table 4). Similarly, there were significant decreases in the proportion of concurrent diagnoses among all males (28% in 2003 to 24% in 2007), all blacks (26% in 2003 to 20% in 2007), and black males (27% in 2003 to 20% in 2007). Over a quarter of new HIV diagnoses in any given year were concurrent diagnoses (average 222 [25%]).

Among all persons diagnosed with HIV between 2003 and 2007, the proportion of males concurrently diagnosed

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Concurrent HIV and AIDS diagnoses (cont.)

(26%) continues to be significantly higher than that of females (21%). Whites and persons of Other race also had significantly higher proportions of concurrent diagnoses (27% and 29%, respectively) compared to blacks (23%).

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 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 testing in medical settings and providing targeted testing in nontraditional venues may help improve health outcomes for those who are infected. The significant decrease in the proportion of concurrent diagnoses among blacks, over time as well as compared to other race groups, suggests earlier and more frequent testing is being conducted for this demographic group.

Table 4.* 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	191 (28%)	184 (27%)	190 (27%)	161 (24%)	166 (24%)	892 (26%)	↓ 4% *
Black	101 (27%)	96 (26%)	97 (25%)	87 (23%)	79 (20%)	460 (24%)	↓ 7% *
White	79 (30%)	69 (27%)	79 (30%)	59 (25%)	70 (29%)	357 (28%)	
Other	11 (32%)	18 (37%)	14 (28%)	15 (33%)	17 (27%)	75 (31%)	
Females	49 (24%)	38 (16%)	57 (26%)	35 (17%)	40 (21%)	219 (21%)	
Black	41 (26%)	33 (17%)	39 (24%)	29 (19%)	29 (20%)	171 (21%)	
White	6 (20%)	4 (13%)	13 (28%)	2 (6%)	8 (25%)	34 (19%)	
Other	2 (13%)	1 (9%)	5 (42%)	4 (25%)	2 (14%)	14 (20%)	
All	240 (27%)	222 (24%)	247 (27%)	196 (23%)	206 (23%)	1112 (25%)	↓ 4% *
Black	142 (26%)	130 (23%)	136 (25%)	115 (22%)	108 (20%)	631 (23%)	↓ 6% *
White	85 (29%)	73 (26%)	93 (30%)	61 (23%)	79 (28%)	391 (27%)	
Other	13 (26%)	19 (32%)	19 (31%)	19 (31%)	19 (25%)	90 (29%)	

*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.

New HIV diagnoses by residence at diagnosis

The rate of new HIV diagnoses remained stable in Southeast (SE) Michigan (Wayne, Oakland, Macomb, Monroe, Lapeer and St. Clair counties) and in the rest of the state ("Out-state") (Table 5). Overall, about two-thirds of new diagnoses are among residents of SE Michigan and about one-third are among Out-state residents.

Table 5.* New HIV diagnoses by residence at diagnosis

Residence	Year of diagnosis									
	2003		2004		2005		2006		2007	
	Num (%)	Rate								
SE Mich	592 (67%)	13.2	601 (66%)	13.4	616 (67%)	13.8	581 (68%)	13.0	596 (67%)	13.4
Out-state	288 (33%)	2.9	306 (34%)	3.0	309 (33%)	3.1	280 (32%)	2.8	292 (33%)	2.9
Total	880 (100%)	8.7	907 (100%)	9.0	925 (100%)	9.2	861 (100%)	8.5	888 (100%)	8.8

*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.
- Rates are per 100,000 population.

Summary

- Between 2003–2007, the number and rate of new diagnoses remained stable at an average of 892 new HIV diagnoses (8.8 per 100,000) occurring each year.
- The highest rates of new HIV diagnoses occurred among:
 - 20 - 44 year olds
 - Black men
 - Males who have sex with males (MSM)*
 - Southeast Michigan residents
- INCREASES in rates occurred among:
 - 13 - 19 year olds (fourth consecutive trend report)
 - Black men, men reporting non-black/non-white race, and all persons reporting non-black/non-white race
 - Black MSM
- DECREASES in rates occurred among:
 - 25 - 29 year olds, 35 - 39 year olds, and 55 - 59 year olds
 - White men
 - White MSM
 - Injection drug users (fourth consecutive trend report)*
- This is the fourth consecutive trend report where we have seen statistically significant increases among 13 - 19 year olds. This increase may be due in part to a true increase in the number of teens becoming infected, as well as testing outreach efforts by the prevention community targeted at teens and young adults in response to the increasing trend presented in previous years' trend reports.
- 85% of new 13-19 year old cases are black (of whom 73% are MSM), whereas 59% of other ages 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.
- 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.
- The significant decrease in the proportion of concurrent diagnoses among blacks, along with lower proportions of concurrent diagnoses among blacks compared to whites and persons of Other races, suggest earlier and more frequent testing is being conducted for this demographic group.

*Annual counts were analyzed for risk groups since there are 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