

ANNUAL REVIEW OF HIV TRENDS IN MICHIGAN (2004 - 2008)

Bureau of Epidemiology, HIV/STD/VH/TB Epidemiology Section
May 2010

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 2004 through 2008 to account for those who may not have been reported to the health department by January 1, 2010. These adjustments were made by weighting the data.

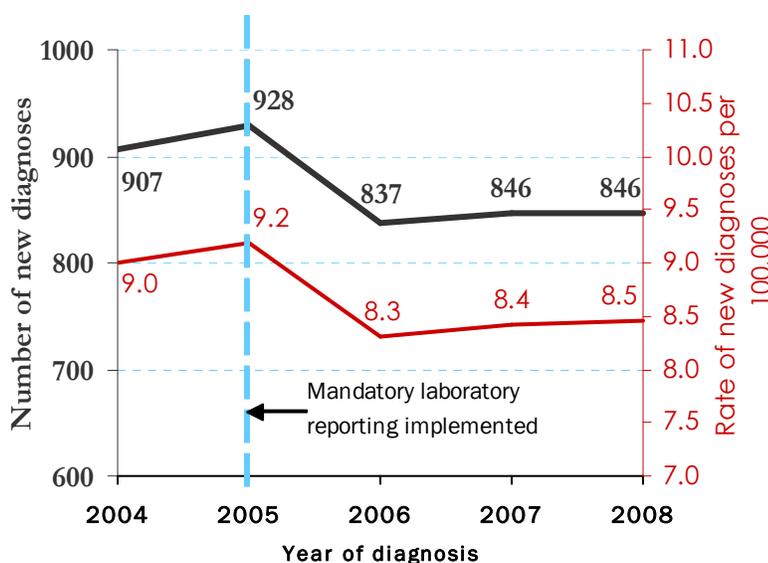
In this report, significant* indicates statistical significance assessed at $p < 0.05$. Unless otherwise noted, numbers cited are for new HIV diagnoses between 2004 and 2008. We used regression modeling on the adjusted data to assess significant changes in annual rates of new diagnoses overall and by race, sex, and age. For risk groups, we analyzed annual counts instead of 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. Only significant trends and their corresponding percent changes are shown. Rates of new diagnoses are all calculated using intercensal annual population estimates released by the Census Bureau in 2008, 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. MDCH has conducted incidence surveillance, which estimated new *infections* rather than *new diagnoses* using the Serologic Testing Algorithm for Recent HIV Seroconversion (STARHS), since 2005. We will supplement this report with incidence data once they are available for multiple years.

OVERVIEW OF TRENDS. The number and rate of new HIV diagnoses decreased significantly in Michigan for the first time since we began analyzing new diagnosis trends in 2001 from 907 (9.0 per 100,000) in 2004 to 846 (8.5 per 100,000) in 2008, with an average decrease in rate of 2% per year. The rate peaked at 9.2 per 100,000 in 2005,

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Figure 1. Number and rate of new HIV diagnoses, Michigan, 2004–2008



KEY FINDINGS

- Rates and numbers of new diagnoses decreased in Michigan.
- Increases were noted among teens for the 5th consecutive trend report
- 85% of newly diagnosed teens are black, compared to 60% of those aged 20+. Black MSM were 62% of these newly diagnosed teens.
- There were decreases among IDUs—the 5th consecutive report to show this trend—and black females.
- Concurrent diagnoses decreased among black males, all males, and overall for the 2nd consecutive trend report
- There were increases among black MSM, and decreases among white MSM.

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Overall trends in new HIV diagnoses (cont.)

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 that voluntarily reported positive HIV-related tests and health care providers, who are required by law to report positive cases. We cannot say whether these decreases are due to successes in prevention or are the result of decreases in the population of the state between 2004 and 2008.

The new HIV diagnoses described in this report include persons diagnosed with HIV, non-AIDS and 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. As a result, the reported number of persons living with HIV disease in Michigan is increasing. MDCH estimates that 18,800 people are living with HIV infection 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 23% per year) and decreased significantly among persons aged 30-39 between 2004 and 2008 (Table 1). Rates in all other ages groups were stable.

This is the fifth consecutive trend report showing significant increases in new diagnoses among 13-19 year olds. While nearly two-thirds of Michigan cases are in Southeast (SE) Michigan, nearly three-fourths of the state's new cases among 13-19 year olds are SE Michigan residents (49% are Detroit residents and 23% reside in other parts of SE Michigan).

The rate of new diagnoses among 20-24 year olds remained stable for the second consecutive year, following 3 annual trend reports showing increases. 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 20-44 year olds.

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 (62% vs. 23%) (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 five years in this young group will likely widen the already large racial gap among persons living with HIV.

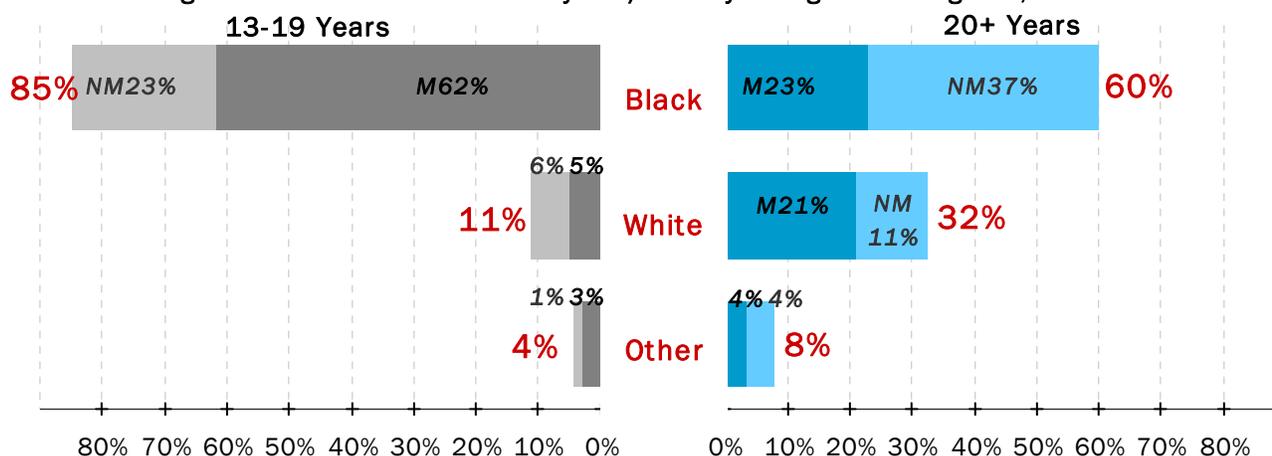
Table 1.† New HIV diagnoses by age at diagnosis

Age at diagnosis	Year of diagnosis									
	2004		2005		2006		2007		2008	
	Num (Pct)	Rate								
0 - 12 yrs	4 (0%)	0.2	3 (0%)	0.2	5 (1%)	0.3	3 (0%)	0.2	6 (1%)	0.4
13 -19 yrs	37 (4%)	3.6	43 (5%)	4.1	55 (7%)	5.3	72 (9%)	7.0	79 (9%)	7.8 ↑ 23%
20 -24 yrs	131 (14%)	18.8	118 (13%)	16.9	105 (13%)	15.2	108 (13%)	15.9	132 (16%)	19.4
25 -29 yrs	112 (12%)	18.0	112 (12%)	17.6	100 (12%)	15.4	106 (12%)	16.1	127 (15%)	19.6
30 -34 yrs	137 (15%)	20.3	134 (14%)	20.5	104 (12%)	16.7	95 (11%)	15.9	95 (11%)	16.0 ↓ 7%
35 -39 yrs	143 (16%)	20.2	132 (14%)	18.8	137 (16%)	19.6	116 (14%)	16.8	107 (13%)	15.9 ↓ 5%
40 -44 yrs	135 (15%)	17.0	151 (16%)	19.3	137 (16%)	18.1	130 (15%)	17.7	98 (12%)	13.8
45 -49 yrs	87 (10%)	10.9	106 (11%)	13.2	88 (10%)	10.9	93 (11%)	11.7	84 (10%)	10.7
50 -54 yrs	59 (7%)	8.5	70 (8%)	9.9	51 (6%)	7.1	69 (8%)	9.3	51 (6%)	6.7
55 -59 yrs	33 (4%)	5.7	34 (4%)	5.6	32 (4%)	5.0	26 (3%)	4.1	35 (4%)	5.4
60 and over	28 (3%)	1.7	26 (3%)	1.5	22 (3%)	1.3	27 (3%)	1.5	32 (4%)	1.8
Total	907 (100%)	9.0	928 (100%)	9.2	837 (100%)	8.3	846 (100%)	8.4	846 (100%)	8.5 ↓ 2%

†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, 2004-2008



NM (lighter outside bars) = Not MSM, includes males and females

M (darker inside bars) = MSM, includes MSM/IDU

Percentages to the left or right of the gray/blue bars indicate the percentage of Black, White, or Other race/ethnicity cases in each age group

New HIV diagnoses by race/sex

The rate of new diagnoses increased among black males (average 2% per year) between 2004 and 2008. This is the third consecutive annual trend report that we have seen increases among black males. The rate decreased among white males for the second time at an average of 6% per year. This is likely what caused a decrease in rate among whites overall (average 5% per year) during this period, as 86% of white cases are male. The rate also decreased among black females (average 9% per year), which resulted in a decrease in rate for all females (average 6% per year), as blacks make up about 75% of cases among females (Table 2). Diagnosis rates remain highest among blacks of both sexes, compared to all other race/sex groups. We did not see the significant increases among persons of Other race/ethnicity, of whom 62% are Hispanic, that we saw between 2003 and 2007. We also did not see the significant increases among males that we saw in last year's report.

Table 2.+ New HIV diagnoses by race/sex

Race/sex	Year of diagnosis									
	2004		2005		2006		2007		2008	
	Num (%)	Rate	Num (%)	Rate	Num (%)	Rate	Num (%)	Rate	Num (%)	Rate
Males	674 (74%)	13.6	703 (76%)	14.2	641 (77%)	13.3	657 (78%)	13.4	658 (78%)	13.4
Black	369 (41%)	54.7	386 (42%)	57.4	371 (44%)	55.3	378 (45%)	56.6	407 (48%)	61.4 ↑2%
White	254 (28%)	6.5	266 (29%)	6.9	226 (27%)	5.8	221 (26%)	5.7	200 (24%)	5.2 ↓6%
Other	51 (6%)	12.7	50 (5%)	12.2	44 (5%)	10.5	59 (7%)	13.7	52 (6%)	11.9
Females	233 (26%)	4.5	225 (24%)	4.4	196 (23%)	3.7	189 (22%)	3.7	188 (22%)	20.2 ↓6%
Black	192 (21%)	25.6	163 (18%)	21.7	147 (18%)	19.7	142 (17%)	19.1	130 (15%)	17.6 ↓9%
White	29 (3%)	0.7	48 (5%)	1.2	31 (4%)	0.8	33 (4%)	0.8	42 (5%)	1.1
Other	12 (1%)	3.1	14 (2%)	3.6	17 (2%)	4.3	14 (2%)	3.5	15 (2%)	3.7
All	907 (100%)	9.0	928 (100%)	9.2	837 (100%)	8.3	846 (100%)	8.4	846 (100%)	8.5 ↓5%
Black	561 (62%)	39.4	549 (59%)	38.6	518 (62%)	36.5	520 (61%)	36.8	537 (63%)	38.3
White	283 (31%)	3.6	315 (34%)	4.0	257 (31%)	3.3	253 (30%)	3.2	242 (29%)	3.1 ↓5%
Other	63 (7%)	8.0	64 (7%)	8.0	62 (7%)	7.5	73 (9%)	8.7	67 (8%)	7.9

†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 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 2004 and 2008, the number of newly diagnosed persons who were injection drug users (IDU) decreased by an average of 14% per year. The number also decreased among persons who were infected through heterosexual sex by an average of 6% per year (Table 3). The trend among IDU is a continuation of the decreasing trend we have seen over the past 5 years we have run trend reports. Data from Michigan's HIV

Behavioral Surveillance suggest reductions among IDUs may partly be attributable to the success of harm reduction programs, such as needle exchange. This is the first year that we saw decreases among persons infected heterosexually. These decreases are related to the decreases among black females, who make up 62% of persons with heterosexual risk.

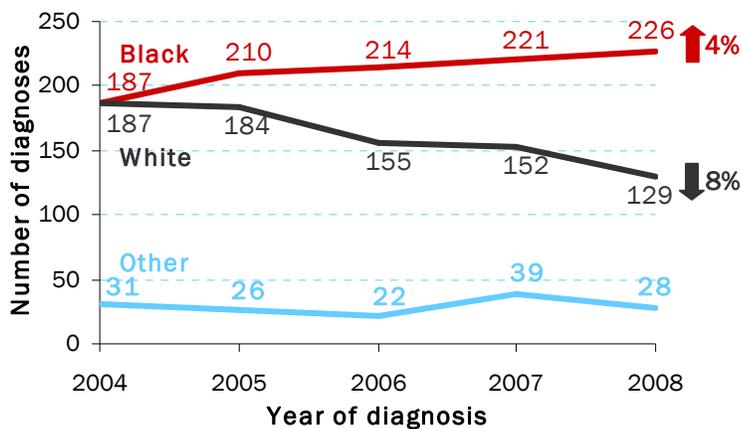
Table 3.† New HIV diagnoses by risk

Risk	Year of diagnosis					
	2004	2005	2006	2007	2008	
MSM	406 (45%)	420 (45%)	391 (47%)	412 (49%)	384 (45%)	
IDU	67 (7%)	70 (8%)	45 (5%)	55 (6%)	34 (4%)	↓ 14%
MSM/IDU	27 (3%)	26 (3%)	19 (2%)	15 (2%)	24 (3%)	
Heterosexual	170 (19%)	172 (19%)	147 (18%)	162 (19%)	125 (15%)	↓ 6%
Other known	4 (0%)	4 (0%)	3 (0%)	3 (0%)	4 (0%)	
No identified risk	233 (26%)	235 (25%)	231 (28%)	199 (24%)	276 (33%)	
Total	907 (100%)	928 (100%)	837 (100%)	846 (100%)	846 (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.

Figure 3. Race among MSM



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.

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 reported. Although they account for about 27% 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/ethnicity. MSM were 46% of all new diagnoses between 2004 and 2008. Of these newly diagnosed MSM, 53% are black, while 40% are white. The number of black MSM cases increased significantly during this period—the third consecutive year since we first looked at race/ethnicity trends among MSM in the 2008 *Annual Review of Trends*. The number of white MSM cases decreased significantly for the second year in a row.

Concurrent HIV and AIDS diagnoses

The proportion of persons diagnosed with AIDS within 30 days of HIV diagnosis (“concurrent”) decreased significantly overall from 25% in 2004 to 20% in 2008 (Table 4). Similarly, there were significant decreases in the proportion of concurrent diagnoses among all males (28% in 2004 to 21% in 2008) and black males (27% in 2004 to 18% in 2008). On average, 23% (205) of new HIV diagnoses in any given year were concurrent.

Among all persons diagnosed with HIV between 2004 and 2008, the proportion of males concurrently diagnosed continues to be significantly higher than that of females (25% vs. 19%). Whites and persons of Other race also had sig-

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Concurrent HIV and AIDS diagnoses (cont.)

nificantly higher proportions of concurrent diagnoses (26% and 28%, respectively) compared to blacks (22%).

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 HIV testing in medical settings, including emergency departments and community health clinics, and provision of HIV testing at community-based and outreach settings will ensure and facilitate access to and promote HIV testing, which may 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 this group engages in earlier and probably more frequent testing.

Table 4.† Concurrent HIV diagnoses in each race/sex group

Race/Sex	Year of diagnosis					Total Num (%)	
	2004 Num (%)	2005 Num (%)	2006 Num (%)	2007 Num (%)	2008 Num (%)		
Males	187 (28%)	189 (27%)	152 (24%)	161 (25%)	137 (21%)	827 (25%)	↓ 7%*
Black	99 (27%)	98 (25%)	84 (23%)	79 (21%)	73 (18%)	432 (23%)	↓ 9%*
White	70 (28%)	78 (29%)	54 (24%)	66 (30%)	51 (25%)	319 (27%)	
Other	18 (35%)	14 (28%)	14 (32%)	16 (28%)	13 (26%)	76 (30%)	
Females	38 (16%)	56 (25%)	34 (18%)	39 (20%)	33 (18%)	200 (19%)	
Black	33 (17%)	37 (23%)	27 (19%)	28 (20%)	24 (18%)	150 (19%)	
White	4 (14%)	13 (27%)	2 (6%)	8 (25%)	6 (15%)	33 (18%)	
Other	1 (8%)	6 (43%)	5 (29%)	2 (14%)	3 (20%)	17 (24%)	
All	225 (25%)	246 (26%)	187 (22%)	200 (24%)	170 (20%)	1027 (24%)	↓ 5%*
Black	132 (24%)	135 (25%)	111 (21%)	108 (21%)	96 (18%)	582 (22%)	
White	74 (26%)	91 (29%)	56 (22%)	74 (29%)	57 (24%)	352 (26%)	
Other	19 (30%)	20 (31%)	19 (31%)	18 (25%)	17 (25%)	93 (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 2004 to 2008, 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 SE Michigan (Wayne, Oakland, Macomb, Monroe, Lapeer and St. Clair counties) but decreased in the rest of the state ("Out-State") (Table 5). The *numbers* of new HIV diagnoses decreased significantly in SE Michigan and Out-State. SE and Out-State Michigan experienced a population decline during this period, which may explain the decreases in the number of new diagnoses. A stable rate where population is decreasing, e.g., in SE Michigan, suggests that the impact of the disease on the population is level or increasing. 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									
	2004		2005		2006		2007		2008	
	Num (%)	Rate								
SE Mich	599 (66%)	13.4	620 (67%)	13.9	568 (68%)	12.7	572 (68%)	12.9	571 (67%)	13.0
Out-State	308 (34%)	5.5	308 (33%)	5.5	269 (32%)	4.8	274 (32%)	4.9	276 (33%)	4.9
Total	907 (100%)	9.0	928 (100%)	9.2	837 (100%)	8.3	846 (100%)	8.4	846 (100%)	8.5

†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.

Summary

- For the first time since we began analyzing trends in new diagnoses, the number and rate of new diagnoses in Michigan between 2004–2008, decreased from 907 (9.0 per 100,000) in 2004 to 846 (8.5 per 100,000) in 2008
- The highest rates of new HIV diagnoses occurred among:
 - 20 - 44 year olds
 - Black males and females
 - Males who have sex with males (MSM)*
 - Southeast Michigan residents
- INCREASES in rates occurred among:
 - 13 - 19 year olds (fifth consecutive trend report)
 - Black males
 - Black MSM*
- DECREASES in rates occurred among:
 - 30- 39 year olds
 - White males, black females, all whites, and all females
 - White MSM*
 - Injection drug users (fifth consecutive trend report) and persons heterosexually infected*
 - Persons residing outside Southeast Michigan
- This is the fifth consecutive trend report where we have seen statistically significant increases among 13 - 19 year olds.
- While nearly 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 (49% are Detroit residents and 23% 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.
- This is the second trend report to show significant decreases in the proportion of concurrent diagnoses among black males, all males, and overall.
- The significant decrease in the proportion of concurrent diagnoses among black males, along with lower proportions of concurrent diagnoses among blacks compared to whites and persons of Other races, suggest this group engages in earlier and probably more frequent testing.

*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