

ANNUAL REVIEW OF HIV TRENDS IN MICHIGAN (2006 - 2010)

Bureau of Disease Control, Prevention and Epidemiology
HIV/STD/VH/TB Epidemiology Section, February 2012

Overall trends in new Michigan HIV diagnoses

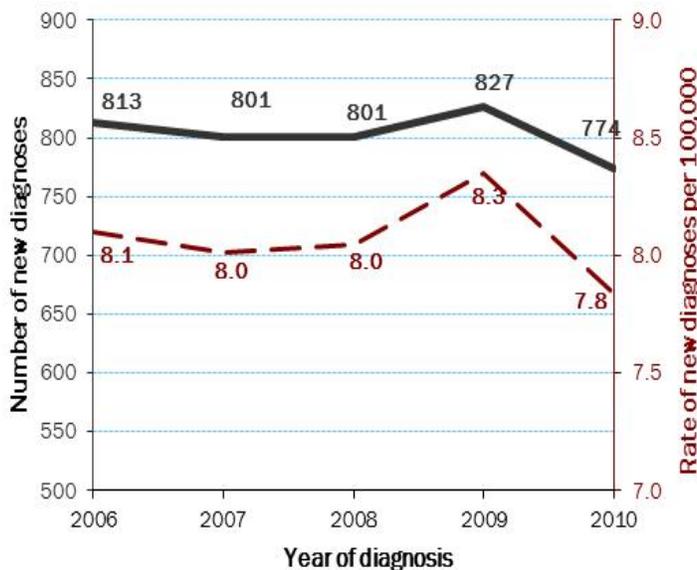
METHODS. To evaluate trends in new HIV diagnoses in Michigan over time, we estimated the number of persons newly diagnosed with HIV infection between 2006 and 2010 by adjusting the number of reported cases to account for those who may not have been reported to the health department by January 1, 2012. These adjustments were made by weighting the data.

Unless otherwise noted, numbers cited include persons living with all stages of HIV infection*. 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 intercensal annual population estimates released by the Census Bureau in 2010 and based on the 2010 census, the most recent year for which 2006-2010 data were available. Rates for age at diagnosis were calculated using the 2010 Bridged-Race 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 progression to stage 3 HIV infection 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. In 2005, MDCH began incidence surveillance, which estimates new *infections* rather than new *diagnoses* using the Serologic Testing Algorithm for Recent HIV Seroconversion (STARHS). MI STARHS data and a comparison to data on diagnoses presented in this report will be released in the coming months and will be available on our website.

Figure 1. Number and rate of new HIV diagnoses in Michigan, 2006–2010



KEY FINDINGS

- Rates of new diagnoses in Michigan remained **stable** overall.
- **Increases** were noted among **20-24** and **25-29** year olds; **decreases** occurred for **35-39** and **40-44** year olds.
- Rates among **13-19** year olds were **stable** for the first report in six trend reports.
- There were **decreases** among **IDUs** for the **7th** consecutive report as well as among **MSM/IDU** and **heterosexuals**.
- Rates **increased** among **males** and **decreased** among **all females, black females, and females of other race**.
- **Concurrent diagnoses** **decreased** among **several subgroups** and **overall**.

*Michigan discontinued use of the term 'AIDS' in January 2012 in accordance with the language in the 2008 HIV Case Definition released by the CDC. HIV infection is now classified by stage of disease, with stage 3 representing AIDS.

OVERVIEW OF TRENDS. The number and rate of new HIV diagnoses in Michigan remained stable between 2006 and 2010 for the second consecutive trend report. There was an average of 803 new cases per year and an average rate of 8.1 cases per 100,000 population. The rate was highest in 2009 at 8.3 and subsequently decreased to 7.8 in 2010.

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 19,500 people were living with HIV infection in Michigan as of January 2011.

New HIV diagnoses by age at diagnosis

The rate of new HIV diagnoses increased significantly among persons 20-24 years of age (an average 12% per year) and among those 25-29 years of age (7% per year). The rate decreased significantly among persons 35-39 and 40-44 years of age (Table 1).

This is the first trend report in six reports that did not show significant increases in new diagnoses among 13-19 year olds. This is the second consecutive report, however, showing increases among 20-24 year olds. Additionally, the rate among 13-19 and 20-24 year olds combined increased significantly by 8% and continues to represent a growing fraction of new diagnoses. Almost three quarters of teen and young adult cases combined are residents of Southeast (SE) Michigan. Of these cases, 62% were residents of the city of Detroit at the time of HIV diagnosis.

This is the second consecutive trend report showing decreases in rates among 40-44 year olds and the fourth report showing decreases among 35-39 year olds. In past years, 35-39 year olds represented one of the highest rates of HIV diagnoses of all age groups. This group now represents the fourth highest rate, with the rates among 20-34, 25-29, and 30-34 year olds surpassing this group. These trends represent a continued shift in the epidemic to younger adults.

Of all teens diagnosed in the last five years, 84% 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 (58% 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.

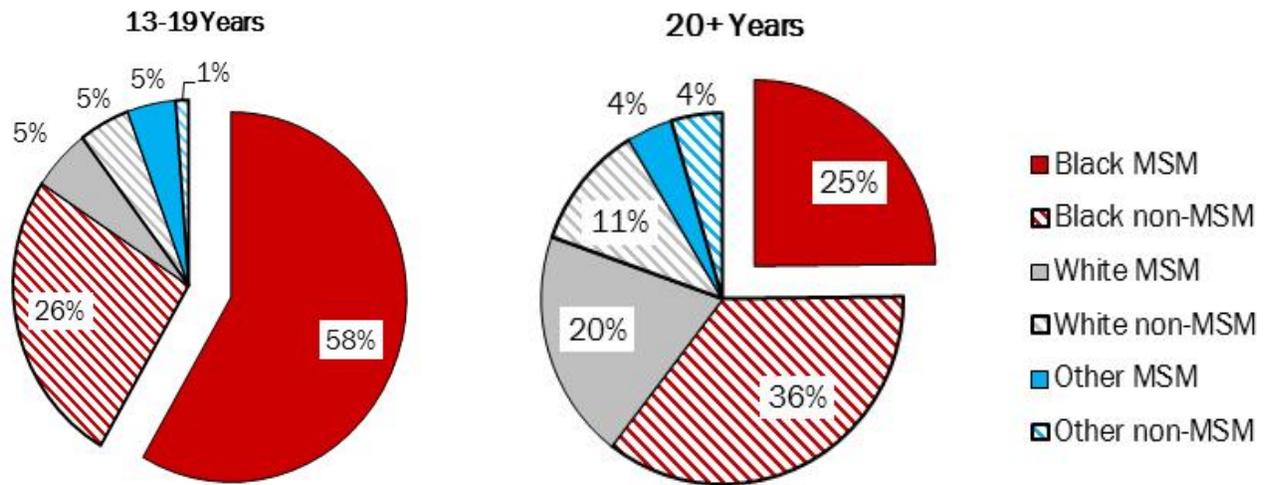
Table 1.+ New HIV diagnoses by age at diagnosis, 2006-2010

Age at diagnosis	Year of diagnosis															
	2006			2007			2008			2009			2010			
	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate	
0 - 12 yrs	4	<1%	0.2	3	<1%	0.2	6	1%	0.4	5	1%	0.3	4	1%	0.3	
13 - 19 yrs	56	7%	5.4	72	9%	6.9	79	10%	7.7	80	10%	8.0	58	8%	5.7	
20 - 24 yrs	110	13%	15.6	106	13%	15.2	131	16%	19.0	147	18%	21.2	153	20%	22.8	↑ 12%
25 - 29 yrs	97	12%	15.5	96	12%	15.1	118	15%	18.7	122	15%	19.6	116	15%	19.7	↑ 7%
30 - 34 yrs	100	12%	16.4	91	11%	15.3	85	11%	14.7	86	10%	14.9	101	13%	17.5	
35 - 39 yrs	131	16%	18.6	106	13%	15.4	103	13%	15.3	92	11%	14.2	87	11%	14.2	↓ 7%
40 - 44 yrs	129	16%	16.9	121	15%	16.4	90	11%	12.7	93	11%	13.5	63	8%	9.4	↓ 12%
45 - 49 yrs	84	10%	10.5	87	11%	10.9	78	10%	10.0	70	8%	9.1	81	11%	10.9	
50 - 54 yrs	50	6%	6.9	65	8%	8.8	48	6%	6.3	69	8%	9.0	50	6%	6.5	
55 - 59 yrs	31	4%	4.9	27	3%	4.2	31	4%	4.8	40	5%	6.0	31	4%	4.5	
60 and over	20	2%	1.2	28	4%	1.6	30	4%	1.7	22	3%	1.1	30	4%	1.6	
Total	813	100%	8.1	801	100%	8.0	801	100%	8.0	827	100%	8.3	774	100%	7.8	

†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.

Figure 2. MSM vs. non-MSM risk by race and age at HIV diagnosis, 2006-2010



New HIV diagnoses by race/sex

The rate of new diagnoses increased among males (average 1% per year) between 2006 and 2010. The rate decreased among black females (average 5% per year) for the third consecutive report and among all females (6% per year) for the second consecutive report. There was also a decrease among females of other race (average 15% per year). There were no decreases in race groups overall. The rate of new diagnoses remained highest among blacks of both sexes compared to all other race/sex groups. In 2010, the rate among black males was over 10 times that of white males, and the rate among black females was 25 times that of white females. These disparities have persisted since we began analyzing HIV trends in MI in 2001, and although decreases in new diagnoses among black females have narrowed the rate difference between black and white females, the gap between black and white males remains unchanged.

Table 2.+ New HIV diagnoses by race/sex, 2006-2010

Race/Sex	Year of diagnosis															
	2006			2007			2008			2009			2010			
	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate	
Male	617	76%	12.5	615	77%	12.5	629	79%	12.9	660	80%	13.6	626	81%	12.9	↑ 1%
Black	355	44%	52.7	352	44%	52.6	390	49%	58.7	403	49%	61.0	365	47%	55.4	
White	216	27%	5.6	205	26%	5.4	182	23%	4.8	213	26%	5.7	205	26%	5.5	
Other	46	6%	10.8	58	7%	13.4	57	7%	12.8	44	5%	9.9	56	7%	12.2	
Female	196	24%	3.8	186	23%	3.7	172	21%	3.4	167	20%	3.3	148	19%	2.9	↓ 6%
Black	145	18%	19.5	140	17%	18.9	118	15%	16.1	134	16%	18.3	113	15%	15.5	↓ 5%
White	31	4%	0.8	30	4%	0.8	39	5%	1.0	20	2%	0.5	24	3%	0.6	
Other	20	2%	4.8	16	2%	3.7	15	2%	3.4	13	2%	3.0	11	1%	2.4	↓ 15%
All	813	100%	8.1	801	100%	8.0	801	100%	8.0	827	100%	8.3	774	100%	7.8	
Black	499	61%	35.2	492	61%	34.9	508	63%	36.3	537	65%	38.6	478	62%	34.4	
White	247	30%	3.2	235	29%	3.0	220	28%	2.9	232	28%	3.1	229	30%	3.0	
Other	66	8%	7.8	75	9%	8.6	72	9%	8.1	58	7%	6.4	67	9%	7.3	

†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 2006 and 2010, the number of newly diagnosed persons who were injecting drug users (IDU) decreased by an average of 12% per year. There were also decreases among MSM/IDU (17% per year) and persons infected through heterosexual sex (8% per year) (Table 3). The decrease among IDU has occurred in the past seven trend reports. This is the second consecutive trend report to show decreases among MSM/IDU and the third consecutive report to show decreases among heterosexuals. Data from

Michigan's HIV Behavioral Surveillance (collected in 2009) 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) account for about 28% of all diagnoses each year but only 17% of all persons living with HIV in MI, regardless of year of diagnosis.

Figure 3 illustrates trends among MSM by race. MSM were 48% of all new diagnoses between 2006 and 2010. Of these newly diagnosed MSM, 55% are black. There were no significant increases or decreases in new diagnoses among MSM of any race between 2006 and 2010, in contrast to the previous trend report which showed increases among black MSM and decreases among white MSM.

Table 3.+ New HIV diagnoses by risk, 2006-2010

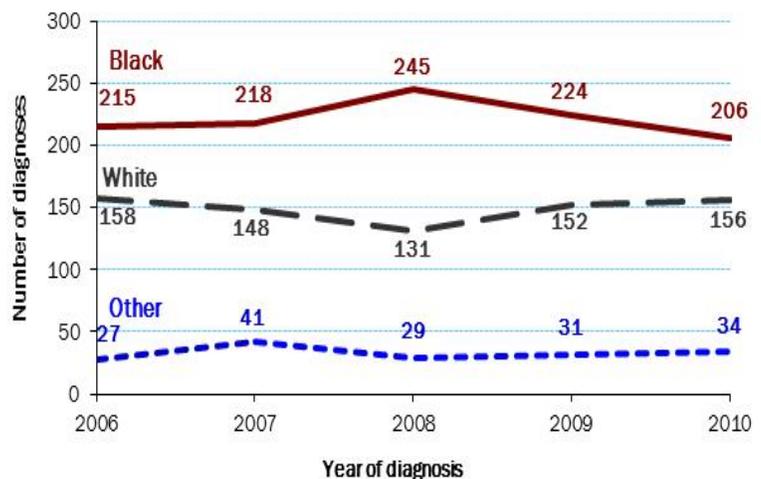
Risk	Year of diagnosis									
	2006		2007		2008		2009		2010	
	Num	%	Num	%	Num	%	Num	%	Num	%
MSM	381	47%	393	49%	385	48%	393	48%	390	50%
IDU	48	6%	50	6%	33	4%	24	3%	36	5%
MSM/IDU	19	2%	14	2%	20	3%	13	2%	6	1%
Heterosexual	147	18%	163	20%	118	15%	133	16%	108	14%
Other known	4	<1%	3	<1%	4	1%	2	<1%	4	1%
No identified risk	214	26%	177	22%	241	30%	261	32%	230	30%
Total	813	100%	801	100%	801	100%	827	100%	774	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 whose female sexual partners are known to be HIV-infected or at high risk for HIV and females who reported sex with males regardless of what is known about their partners' HIV status or 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.

↓ 12%
↓ 17%
↓ 8%

Figure 3. Race among MSM, 2006-2010



Concurrent diagnoses

The proportion of persons diagnosed with stage 3 HIV infection within 30 days of diagnosis (concurrent) decreased significantly overall from 27% in 2006 to 22% in 2010 (Table 4). Similarly, there were significant decreases in the proportion of concurrent diagnoses among all males as well as black males. There were also significant decreases in the proportion of concurrent diagnoses among white females and females of other race. The proportion decreased in blacks overall, most likely due to the decreases among black males (who make up 71% of black diagnoses). Men had

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Concurrent diagnoses (cont.)

a significantly higher proportion of concurrent diagnoses than women, and people of black race had significantly fewer concurrent diagnoses than people of all other races (21% vs. 26%, respectively).

Many 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.

New HIV diagnoses by residence at diagnosis

The rate and number of new HIV diagnoses remained stable in SE Michigan (Lapeer, Macomb, Monroe, Oakland, St. Clair, and Wayne counties) and the rest of the state ("Out-State") for the second consecutive trend report (Table 5). The burden of new diagnoses continues to disproportionately affect SE MI. Two-thirds of new diagnoses (excluding prison diagnoses and diagnoses with unknown residence) were among residents of SE Michigan.

Table 5.+ New HIV diagnoses by residence at diagnosis, 2006-2010

Residence	Year of diagnosis														
	2006			2007			2008			2009			2010		
	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate	Num	%	Rate
SE Michigan	550	70%	12.5	546	70%	12.6	546	70%	12.7	564	69%	13.2	532	69%	12.5
Out-state	236	30%	4.5	235	30%	4.2	233	30%	4.1	249	31%	4.4	234	31%	4.2
Prison or Unknown	27	3%	N/A	20	3%	N/A	22	3%	N/A	13	2%	N/A	8	1%	N/A
Total	786	100%	8.9	781	100%	8.1	778	100%	8.0	813	100%	8.0	766	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.
- Rates are per 100,000 population.

Table 4.+ Concurrent HIV diagnoses by race/sex, 2006-2010

Race/Sex	Year of diagnosis												Total	%
	2006		2007		2008		2009		2010		Total			
	Num	%	Num	%	Num	%	Num	%	Num	%	Num	%		
Male	174	28%	160	26%	147	23%	130	20%	150	24%	761	24%	↓4%	
Black	100	28%	78	22%	73	19%	72	18%	78	21%	401	22%	↓7%	
White	58	27%	67	33%	56	31%	46	22%	59	29%	286	28%		
Other	16	35%	14	24%	18	32%	12	28%	13	23%	74	28%		
Female	45	23%	40	22%	31	18%	27	16%	23	15%	166	19%		
Black	36	25%	29	21%	24	21%	23	17%	22	19%	134	21%		
White	2	6%	9	30%	4	10%	4	21%	1	4%	20	14%	↓2%	
Other*	7	35%	2	12%	3	20%	0	0%	0	0%	12	16%	↓15%	
All	219	27%	200	25%	178	22%	157	19%	173	22%	928	23%	↓5%	
Black	136	27%	108	22%	97	19%	94	18%	100	21%	535	21%	↓6%	
White	60	24%	76	33%	60	27%	50	22%	60	26%	307	26%		
Other	23	35%	16	22%	21	29%	12	21%	13	19%	86	25%		

†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 2006 to 2010, which do not take into account the fluctuations from year to year.
- *There were no concurrent cases for females of other race in 2009 or 2010, so trend is for 2006-2008.

Summary

- The number and rate of new HIV diagnoses in Michigan remained stable between 2006 and 2010 for the 2nd consecutive trend report, with an average of 803 new cases per year and an average rate of 8.1.
- The highest rates of new HIV diagnoses occurred among:
 - 20 - 29 year olds
 - Black males and females
 - Men who have sex with men (MSM)*
 - Southeast Michigan residents
- INCREASES in rates occurred among:
 - 20 - 24 year olds (2nd consecutive trend report) and 25-29 year olds
 - Males
- DECREASES in rates occurred among:
 - 35-39 year olds (4th consecutive report) and 40-44 year olds (2nd consecutive report)
 - Black females (2nd consecutive report), females of other race, and females overall (third consecutive report)
 - Injecting drug users (7th consecutive report), MSM/IDU (2nd consecutive report), and persons heterosexually infected (3rd consecutive report)*
- For the first report in six reports, the rate among 13-19 year olds did not increase.
- Almost three fourths of Michigan's new cases among 13 - 24 year olds were residents of SE Michigan at diagnosis. Of these SE MI young adults, 62% lived in the city of Detroit.
- 84% 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 activities.
- Decreases in concurrent diagnoses occurred overall as well as among several subgroups: black males, males overall, white females, other females, and females overall. Decreases also occurred among blacks overall. This is the 4th 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 among the groups showing decreases.

*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) → 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