

6.3 Sexually Transmitted Infections

The Centers for Disease Control and Prevention estimates that 20 million new sexually transmitted infections (STIs) occur in men and women each year.¹ Chlamydia and gonorrhea (STIs) are the two most commonly reported infectious diseases in the United States. Sexually transmitted infections can be difficult to diagnose, and so many additional cases go unreported. It is estimated that STIs cost the U.S. healthcare system \$16 billion per year.² Additionally, the cost in health consequences (both immediate and long-term) to individuals is significant.

Only a few kinds of STIs are reportable (required by law to be reported by laboratories and health care providers). Reportable STIs include chlamydia, gonorrhea, chancroid and syphilis. Although human papilloma virus and genital herpes virus are highly prevalent (common in the population) these infections are not reported at all to the public health surveillance system.

Chlamydia, gonorrhea and syphilis cases are diagnosed and reported when symptomatic individuals present for care and test positive for an infection, or when partners of diagnosed cases are brought to testing and treatment. Because many infected individuals may be asymptomatic and/or may not be identified (and tested) during a case investigation, the number of cases reported is an underrepresentation of disease in the community.

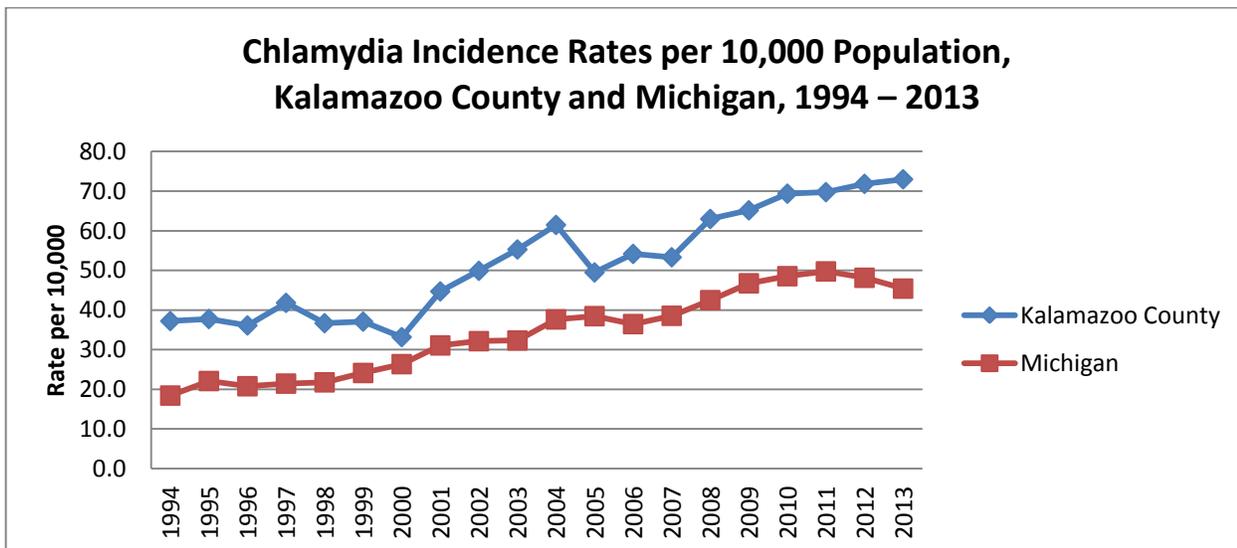
¹ Sexually Transmitted Infections in the United States, Fact Sheet, 2013, Centers for Disease Control and Prevention, accessed on the web at <http://www.cdc.gov/std/stats/STI-Estimates-Fact-Sheet-Feb-2013.pdf>.

² Trends in Reportable Sexually Transmitted Diseases in the United States, 2012, Centers for Disease Control and Prevention, accessed on the web at <http://www.cdc.gov/std/stats12/toc.htm>

6.3.1 Chlamydia

In Kalamazoo County, chlamydia rates increased between 2000 and 2004, declined in 2005 and increased again in 2006. From 2007 through 2013, rates have increased each year. The rate in 2013, 73.0 cases per 10,000 population, was significantly higher than rates in the mid-nineties through 2009. In comparison with rates in Michigan, Kalamazoo County has had a higher chlamydia rate each year between 1994 and 2013. The rate in Michigan dropped slightly in 2012 and again in 2013 while Kalamazoo's rate has continued to rise.

Some of the increase in recent years may be attributed to a HEDIS (Health Plan Employer Data and Information Set) measure: the proportion of females ages of 16 to 24 who were screened for chlamydial infection annually.³ In Michigan, screening percentages reported by health plans has increased from 30.6% in 2000 to 55.1% in 2008.⁴ In 2010, this became a required measure for managed-care health plans. It is expected that as the screening rate continues to climb, the number of chlamydia cases may continue to increase as more asymptomatic cases are identified through annual screening tests. Identifying more asymptomatic cases among women will help to reduce morbidity from Pelvic Inflammatory Disease (PID) as well as future problems with fertility and ectopic pregnancies. Screening asymptomatic young women (through which sexual partners can then be identified) will help to reduce the reservoir of disease in the community, and could result in a later decline in the number of incident cases.



³ <http://www.cdc.gov/std/chlamydia/hedis.htm>

⁴ <http://www.cdc.gov/std/chlamydia/female-enrollees-00-08.htm>

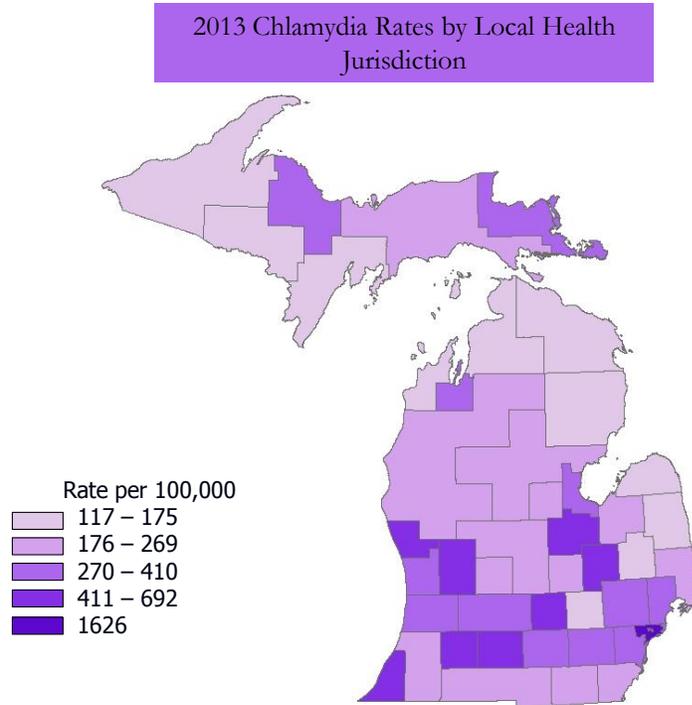
Chlamydia in Kalamazoo County and Michigan, 1994 – 2013

| Year | Kalamazoo County | | | Michigan | | |
|------|------------------|-----------------|-------------|----------|-----------------|-------------|
| | Number | Rate per 10,000 | 95% CI | Number | Rate per 10,000 | 95% CI |
| 1994 | 858 | 37.2 | (34.7-39.7) | 17,688 | 18.4 | (18.2-18.7) |
| 1995 | 876 | 37.7 | (35.2-40.2) | 21,378 | 22.1 | (21.8-22.4) |
| 1996 | 845 | 36.1 | (33.7-38.6) | 20,277 | 20.8 | (20.5-21.1) |
| 1997 | 983 | 41.8 | (39.2-44.4) | 21,033 | 21.4 | (21.2-21.7) |
| 1998 | 867 | 36.7 | (34.3-39.1) | 21,431 | 21.8 | (21.5-22.1) |
| 1999 | 881 | 37.1 | (34.6-39.5) | 23,872 | 24.1 | (23.8-24.4) |
| 2000 | 793 | 33.2 | (30.9-35.5) | 26,237 | 26.4 | (26.0-26.7) |
| 2001 | 1,073 | 44.7 | (42.0-47.4) | 31,090 | 31.1 | (30.7-31.4) |
| 2002 | 1,206 | 49.9 | (47.1-52.7) | 32,274 | 32.1 | (31.8-32.5) |
| 2003 | 1,346 | 55.3 | (52.3-58.2) | 32,549 | 32.3 | (32.0-32.7) |
| 2004 | 1,487 | 61.5 | (58.4-64.6) | 37,979 | 37.6 | (37.3-38.0) |
| 2005 | 1,200 | 49.5 | (46.7-52.3) | 38,817 | 38.5 | (38.1-38.8) |
| 2006 | 1,317 | 54.2 | (51.2-57.1) | 36,753 | 36.5 | (36.1-36.8) |
| 2007 | 1,303 | 53.3 | (50.4-56.2) | 38,748 | 38.6 | (38.2-38.9) |
| 2008 | 1,548 | 63.0 | (59.9-66.1) | 42,494 | 42.5 | (42.1-42.9) |
| 2009 | 1,615 | 65.2 | (62.0-68.3) | 46,533 | 46.7 | (46.3-47.2) |
| 2010 | 1,739 | 69.4 | (66.1-72.6) | 47,948 | 48.5 | (48.1-49.0) |
| 2011 | 1,760 | 69.8 | (66.5-73.0) | 49,128 | 49.7 | (49.3-50.2) |
| 2012 | 1,829 | 71.8 | (68.6-75.1) | 47,578 | 48.1 | (47.7-48.6) |
| 2013 | 1,858 | 73.0 | (69.7-76.3) | 44,878 | 45.4 | (45.0-45.8) |

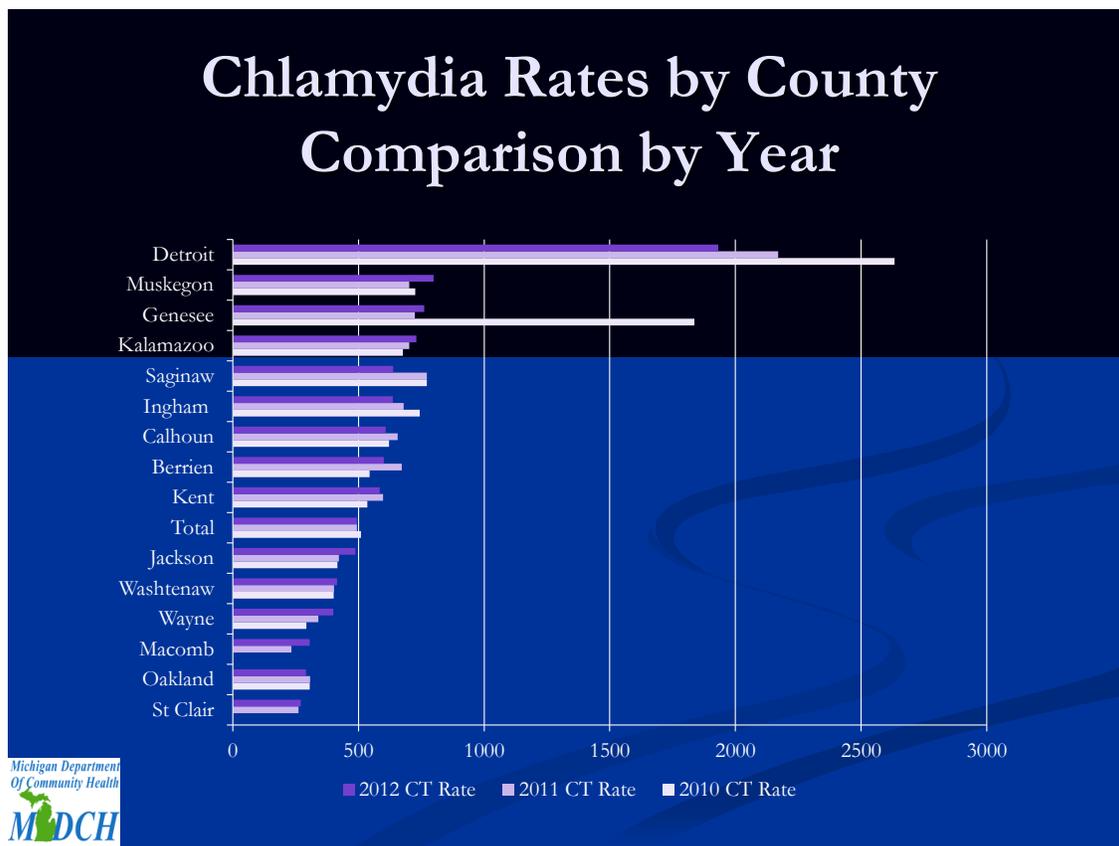
Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section, Michigan Sexually Transmitted Diseases Database, 1994 – 2004 data; Michigan Disease Surveillance System, 2005 - 2013 data (provisional 2013 data as of 4/07/2014).

Compared with other local health jurisdictions in Michigan (some of which are single counties like Kalamazoo County, others are multiple counties combined into one health jurisdiction), Kalamazoo County is in the second highest tier rate for chlamydia in 2012. Kalamazoo County ranked fourth among local health jurisdictions for highest chlamydia rates, following the City of Detroit, Muskegon County and Genesee County.⁵

⁵ Note that rates are presented here as per 100,000 rather than per 10,000 population as is shown in most of this report.



Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section

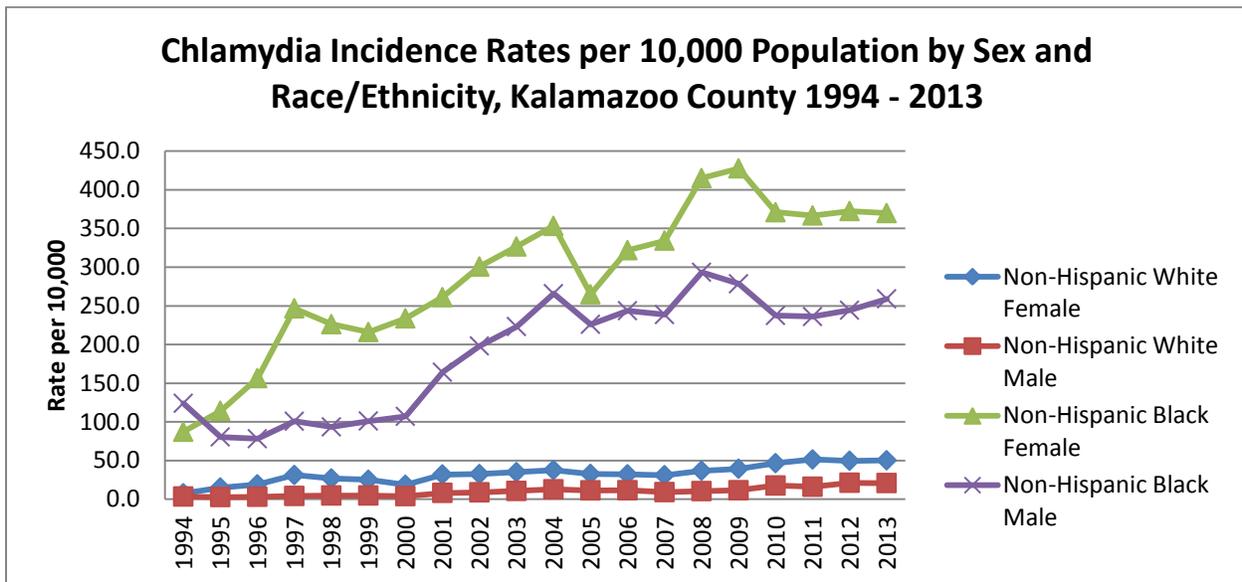


Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section

A disparity in chlamydia rates exists by both sex and race. More chlamydia cases are reported among females than males, and more cases are reported among black, non-Hispanics than white, non-Hispanics. The number of cases reported among the Hispanic population in Kalamazoo County is too low to calculate a reliable rate, so STI rates for this group are not presented in this report.

Chlamydia rates among black, non-Hispanic females increased each year between 1999 and 2004. Although rates decreased from 2004 to 2005 among this group, the 2005 rate remained significantly higher than rates in the mid-1990s and from 2006 through 2009 the rate increased each year. In the past four years, the rate has remained high but has not continued to increase.

Rates among black, non-Hispanic males have been lower than rates among black, non-Hispanic females, but have followed a similar trend since the late 1990s. Rates among white, non-Hispanic females have increased slightly since the late 1990s; rates among white non-Hispanic males have increased since 2000 but remain very low in comparison to other race/ethnicity groups.



Chlamydia by Sex and Race/Ethnicity, Kalamazoo County 1994 - 2013

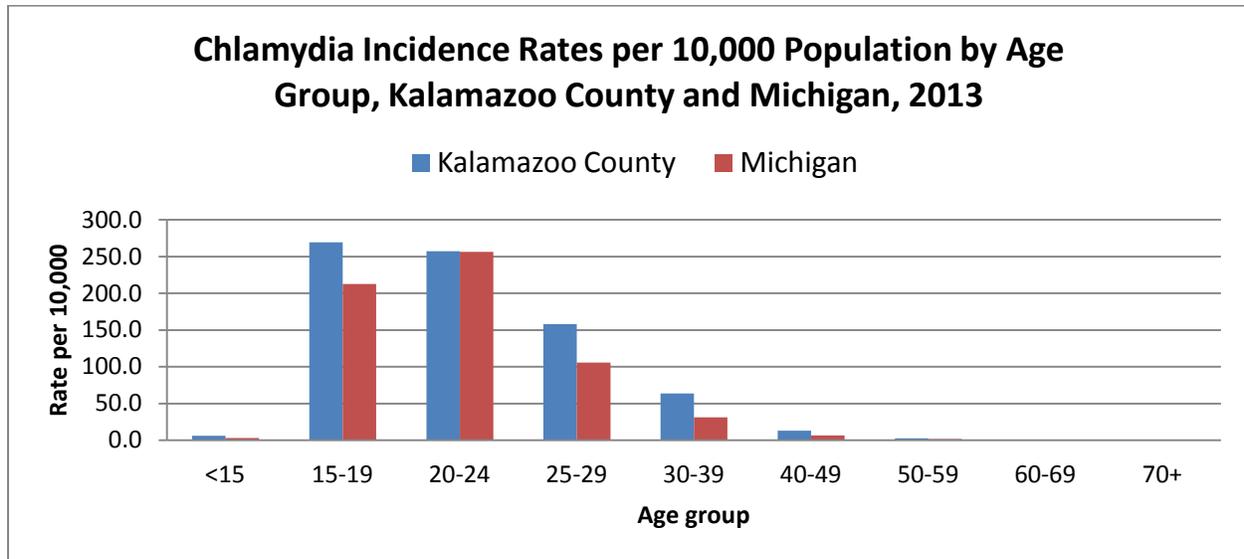
| Year | White, non-Hispanic females | | | White, non-Hispanic males | | |
|------|-----------------------------|-----------------|-------------|---------------------------|-----------------|-------------|
| | Cases | Rate per 10,000 | 95% CI | Cases | Rate per 10,000 | 95% CI |
| 1994 | 78 | 7.6 | (5.9-9.3) | 34 | 3.5 | (2.3-4.7) |
| 1995 | 156 | 15.1 | (12.7-17.5) | 27 | 2.8 | (1.7-3.9) |
| 1996 | 199 | 19.2 | (16.5-21.9) | 31 | 3.2 | (2.1-4.3) |
| 1997 | 325 | 31.3 | (27.9-34.7) | 41 | 4.2 | (2.9-5.5) |
| 1998 | 279 | 26.8 | (23.7-29.9) | 47 | 4.8 | (3.4-6.2) |
| 1999 | 262 | 25.1 | (22.1-28.1) | 47 | 4.8 | (3.4-6.2) |
| 2000 | 194 | 18.6 | (16.0-21.2) | 39 | 4.0 | (2.7-5.3) |
| 2001 | 335 | 32.0 | (28.6-35.4) | 80 | 8.2 | (6.4-10.0) |
| 2002 | 342 | 32.5 | (29.1-35.9) | 87 | 8.9 | (7.0-10.8) |
| 2003 | 369 | 35.0 | (31.4-38.6) | 106 | 10.7 | (8.7-12.7) |
| 2004 | 394 | 37.7 | (34.0-41.4) | 126 | 12.8 | (10.6-15.0) |
| 2005 | 342 | 32.7 | (29.2-36.2) | 112 | 11.4 | (9.3-13.5) |
| 2006 | 337 | 32.2 | (28.8-35.6) | 114 | 11.6 | (9.5-13.7) |
| 2007 | 327 | 31.1 | (27.7-34.5) | 91 | 9.2 | (7.3-11.1) |
| 2008 | 388 | 36.8 | (33.1-40.5) | 104 | 10.5 | (8.5-12.5) |
| 2009 | 417 | 39.4 | (35.6-43.2) | 115 | 11.6 | (9.5-13.7) |
| 2010 | 484 | 46.6 | (42.5-50.7) | 176 | 17.7 | (15.1-20.3) |
| 2011 | 535 | 51.4 | (47.1-55.7) | 161 | 16.1 | (13.6-18.6) |
| 2012 | 521 | 49.7 | (45.4-54.0) | 214 | 21.3 | (18.4-24.2) |
| 2013 | 527 | 50.3 | (46.0-54.6) | 210 | 20.9 | (18.1-23.7) |

Chlamydia by Sex and Race/Ethnicity, Kalamazoo County 1994 – 2013 (continued)

| Year | White, non-Hispanic females | | | White, non-Hispanic males | | |
|------|-----------------------------|-----------------|-------------|---------------------------|-----------------|-------------|
| | Cases | Rate per 10,000 | 95% CI | Cases | Rate per 10,000 | 95% CI |
| 1994 | 78 | 7.6 | (5.9-9.3) | 34 | 3.5 | (2.3-4.7) |
| 1995 | 156 | 15.1 | (12.7-17.5) | 27 | 2.8 | (1.7-3.9) |
| 1996 | 199 | 19.2 | (16.5-21.9) | 31 | 3.2 | (2.1-4.3) |
| 1997 | 325 | 31.3 | (27.9-34.7) | 41 | 4.2 | (2.9-5.5) |
| 1998 | 279 | 26.8 | (23.7-29.9) | 47 | 4.8 | (3.4-6.2) |
| 1999 | 262 | 25.1 | (22.1-28.1) | 47 | 4.8 | (3.4-6.2) |
| 2000 | 194 | 18.6 | (16.0-21.2) | 39 | 4.0 | (2.7-5.3) |
| 2001 | 335 | 32.0 | (28.6-35.4) | 80 | 8.2 | (6.4-10.0) |
| 2002 | 342 | 32.5 | (29.1-35.9) | 87 | 8.9 | (7.0-10.8) |
| 2003 | 369 | 35.0 | (31.4-38.6) | 106 | 10.7 | (8.7-12.7) |
| 2004 | 394 | 37.7 | (34.0-41.4) | 126 | 12.8 | (10.6-15.0) |
| 2005 | 342 | 32.7 | (29.2-36.2) | 112 | 11.4 | (9.3-13.5) |
| 2006 | 337 | 32.2 | (28.8-35.6) | 114 | 11.6 | (9.5-13.7) |
| 2007 | 327 | 31.1 | (27.7-34.5) | 91 | 9.2 | (7.3-11.1) |
| 2008 | 388 | 36.8 | (33.1-40.5) | 104 | 10.5 | (8.5-12.5) |
| 2009 | 417 | 39.4 | (35.6-43.2) | 115 | 11.6 | (9.5-13.7) |
| 2010 | 484 | 46.6 | (42.5-50.7) | 176 | 17.7 | (15.1-20.3) |
| 2011 | 535 | 51.4 | (47.1-55.7) | 161 | 16.1 | (13.6-18.6) |
| 2012 | 521 | 49.7 | (45.4-54.0) | 214 | 21.3 | (18.4-24.2) |
| 2013 | 527 | 50.3 | (46.0-54.6) | 210 | 20.9 | (18.1-23.7) |

Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section, Michigan Sexually Transmitted Diseases Database, 1994 – 2004 data; Michigan Disease Surveillance System, 2005 - 2013 data (provisional 2013 data as of 4/7/2014).

Chlamydia infections are most prevalent among teens and young adults. In Kalamazoo County in 2013, the highest chlamydia incidence rate was among the population between 15 and 19 years old. In Michigan, rates were highest among teens and adults 20 to 24 years old. Among ages <15, 15 to 19, 25 to 29, 30 to 39, and 40 to 49, rates were significantly higher in Kalamazoo County than in Michigan. Rates were similar in the county and state among 20 to 24 year olds.



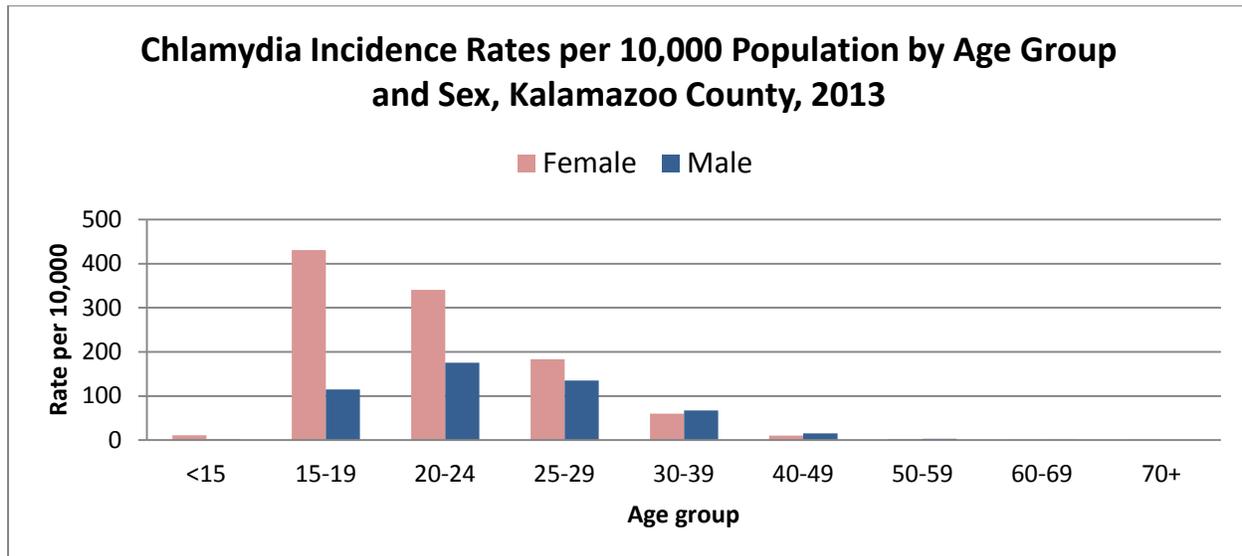
Chlamydia by Age Group in Kalamazoo County and Michigan, 2013

| Age Group | Kalamazoo County | | | Michigan | | |
|-----------|------------------|-----------------|---------------|----------|-----------------|---------------|
| | Number | Rate per 10,000 | 95% CI | Number | Rate per 10,000 | 95% CI |
| <15 | 28 | 6.0 | (3.8-8.2) | 580 | 3.1 | (2.8-3.4) |
| 15-19 | 506 | 269.4 | (246.2-292.6) | 14,819 | 212.6 | (209.2-216.0) |
| 20-24 | 809 | 257.3 | (239.8-274.8) | 18,304 | 256.4 | (252.7-260.1) |
| 25-29 | 271 | 158.3 | (139.6-177.0) | 6,230 | 105.8 | (103.2-108.4) |
| 30-39 | 193 | 63.7 | (54.7-72.7) | 3,620 | 31.3 | (30.3-32.3) |
| 40-49 | 39 | 12.9 | (8.9-16.9) | 898 | 6.6 | (6.2-7.0) |
| 50-59 | 9 | 2.7 | (0.9-4.5) | 233 | 1.6 | (1.4-1.8) |
| 60-69 | 2 | * | * | 58 | 0.5 | (0.4-0.6) |
| 70+ | 1 | * | * | 88 | 0.9 | (0.7-1.1) |

Source: Michigan Disease Surveillance System, provisional data as of 4/7/2014.

*Rate not shown, confidence interval exceeds possible limits.

Chlamydia rates differed by sex in all age groups younger than 25 years in Kalamazoo County in 2013; in these age groups, chlamydia rates among females were significantly higher than rates among males. In all other age groups, rates among males and females were similar.



Chlamydia by Age Group and Sex, Kalamazoo County, 2013

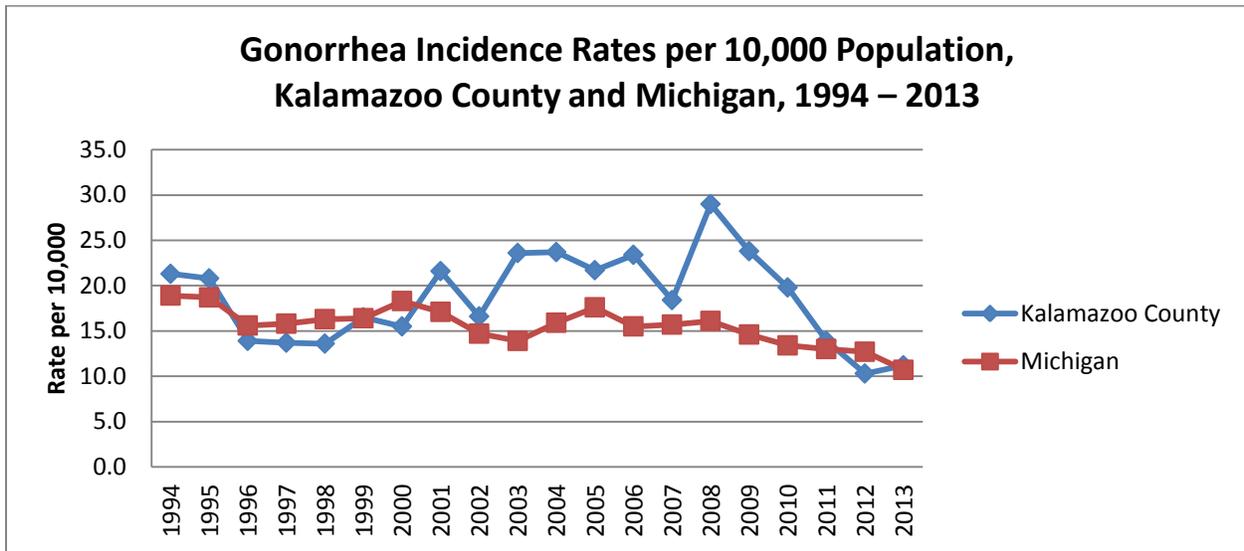
| Age Group | Female | | | Male | | |
|-----------|--------|-----------------|---------------|--------|-----------------|---------------|
| | Number | Rate per 10,000 | 95% CI | Number | Rate per 10,000 | 95% CI |
| <15 | 25 | 11 | (6.7-15.3) | 3 | * | * |
| 15-19 | 396 | 430.7 | (389.2-472.2) | 110 | 114.7 | (93.4-136.0) |
| 20-24 | 529 | 340.5 | (312.0-369.0) | 279 | 175.4 | (155.0-195.8) |
| 25-29 | 152 | 183.2 | (154.3-212.1) | 119 | 134.8 | (110.7-158.9) |
| 30-39 | 92 | 60.2 | (47.9-72.5) | 101 | 67.2 | (54.1-80.3) |
| 40-49 | 16 | 10.3 | (5.2-15.4) | 23 | 15.5 | (9.2-21.8) |
| 50-59 | 4 | 2.3 | (0.0-4.6) | 5 | 3.1 | (0.4-5.8) |
| 60-69 | 1 | 0.8 | * | 1 | * | * |
| 70+ | 1 | 0.8 | * | 0 | 0 | (0.0-0.0) |

Source: Michigan Disease Surveillance System, provisional data as of 4/7/2014.

*Rate not shown, confidence interval exceeds possible limits.

6.3.2 Gonorrhea

The gonorrhea incidence rate in Kalamazoo County in 2013 was 11.2 per 10,000 population. Rates in the county have followed a trend similar to the trend in Michigan prior to 2001, but from 2001 through 2010 the county rates were significantly higher than state rates. In 2008 the gonorrhea rate increased sharply to 29.0 per 10,000 population; the rate declined each year between 2009 and 2012 and rose slightly in 2013. The current rate in Kalamazoo County is similar to the rate in Michigan.

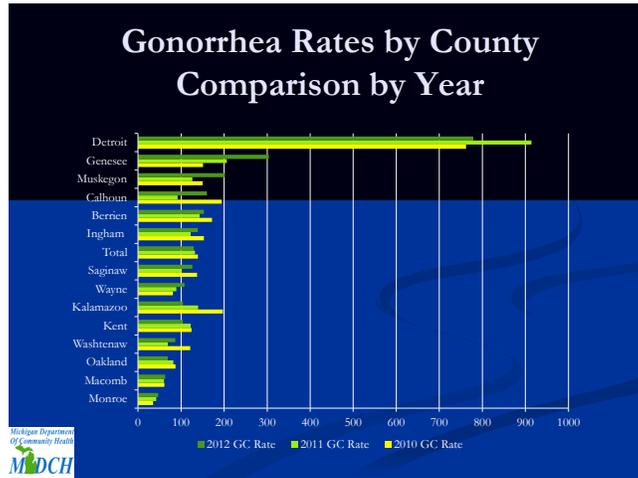


Gonorrhea in Kalamazoo County and Michigan, 1994 – 2013

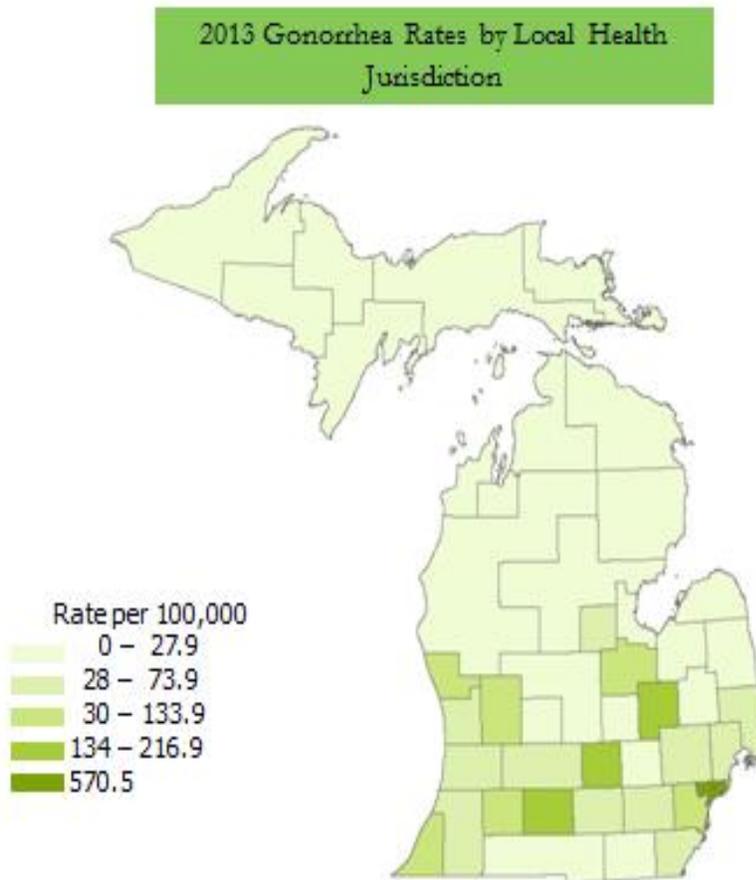
| Year | Kalamazoo County | | | Michigan | | |
|------|------------------|-----------------|-------------|----------|-----------------|-------------|
| | Number | Rate per 10,000 | 95% CI | Number | Rate per 10,000 | 95% CI |
| 1994 | 491 | 21.3 | (19.4-23.2) | 18,100 | 18.9 | (18.6-19.2) |
| 1995 | 482 | 20.8 | (18.9-22.7) | 18,117 | 18.7 | (18.4-19.0) |
| 1996 | 324 | 13.9 | (12.4-15.4) | 15,267 | 15.6 | (15.4-15.8) |
| 1997 | 322 | 13.7 | (12.2-15.2) | 15,524 | 15.8 | (15.6-16.0) |
| 1998 | 321 | 13.6 | (12.1-15.1) | 16,097 | 16.3 | (16.0-16.6) |
| 1999 | 392 | 16.5 | (14.9-18.1) | 16,189 | 16.4 | (16.1-16.7) |
| 2000 | 370 | 15.5 | (13.9-17.1) | 18,182 | 18.3 | (18.0-18.6) |
| 2001 | 519 | 21.6 | (19.7-23.5) | 17,121 | 17.1 | (16.8-17.4) |
| 2002 | 401 | 16.6 | (15.0-18.2) | 14,770 | 14.7 | (14.5-14.9) |
| 2003 | 575 | 23.6 | (21.7-25.5) | 13,965 | 13.9 | (13.7-14.1) |
| 2004 | 574 | 23.7 | (21.8-25.6) | 16,081 | 15.9 | (15.7-16.1) |
| 2005 | 525 | 21.7 | (19.8-23.6) | 17,759 | 17.6 | (17.3-17.9) |
| 2006 | 570 | 23.4 | (21.5-25.3) | 15,677 | 15.5 | (15.3-15.7) |
| 2007 | 449 | 18.4 | (16.7-20.1) | 15,771 | 15.7 | (15.5-15.9) |
| 2008 | 712 | 29.0 | (26.9-31.1) | 16,106 | 16.1 | (15.9-16.3) |
| 2009 | 589 | 23.8 | (21.9-25.7) | 14,555 | 14.6 | (14.4-14.8) |
| 2010 | 496 | 19.8 | (18.1-21.5) | 13,192 | 13.4 | (13.2-13.6) |
| 2011 | 351 | 13.9 | (12.4-15.4) | 12,824 | 13.0 | (12.8-13.2) |
| 2012 | 262 | 10.3 | (9.1-11.5) | 12,585 | 12.7 | (12.5-12.9) |
| 2013 | 285 | 11.2 | (9.9-12.5) | 10,575 | 10.7 | (10.5-10.9) |

Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section, Michigan Sexually Transmitted Diseases Database, 1994 – 2004 data; Michigan Disease Surveillance System, 2005 - 2013 data (provisional 2013 data as of 4/7/2014).

In 2012, Kalamazoo County had the ninth highest gonorrhea rate among Michigan counties. Compared with other local health jurisdictions in Michigan in 2013, Kalamazoo County was in the third highest tier for gonorrhea incidence rates in 2013.⁶



Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section

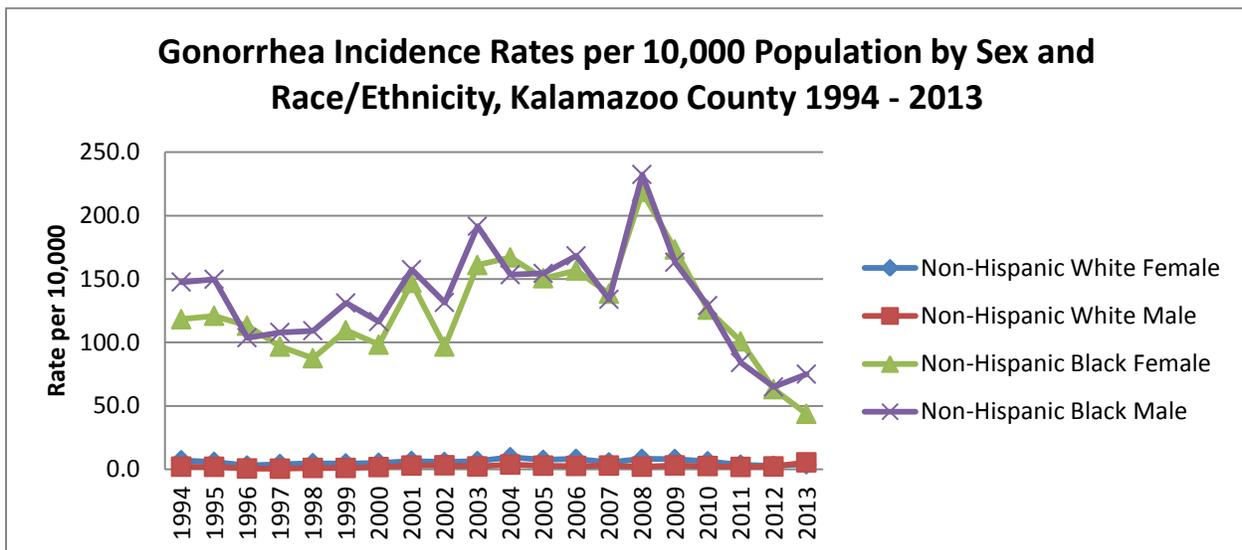


Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section (note legend error on map, the color patch corresponding with Kalamazoo County should be labeled 74 - 133.9 per 100,000 rather than 30 - 133.9 per 100,000)

⁶ Note that rates are presented here as per 100,000 rather than per 10,000 population as is shown in most of this report.

A disparity in gonorrhea rates exists by race. Gonorrhea cases are reported at a higher rate among black, non-Hispanics than white, non-Hispanics. The number of cases reported among the Hispanic population in Kalamazoo County is too low to calculate a reliable rate, so STI rates for this group are not presented in this report.

Gonorrhea rates among black, non-Hispanic males have shown an overall upward trend from 1996 to 2003 and declined between 2004 and 2007. The highest rate among this group in Kalamazoo County was in 2008. Among black, non-Hispanic females, gonorrhea rates followed a trend similar to that of rates among black, non-Hispanic males since the late 1990s until 2013 when rates among black, non-Hispanic men increased while rates among black, non-Hispanic females continued to decrease. Rates among white, non-Hispanic females have been stable since the mid-1990s; rates among white non-Hispanic males have increased since the late 1990s, but have been stable since 2000. Rates among white, non-Hispanic females and males remain very low in comparison to other race/ethnicity groups.



Gonorrhea by Sex and Race/Ethnicity, Kalamazoo County 1994 - 2013

| Year | White, non-Hispanic females | | | White, non-Hispanic males | | |
|------|-----------------------------|-----------------|------------|---------------------------|-----------------|-----------|
| | Cases | Rate per 10,000 | 95% CI | Cases | Rate per 10,000 | 95% CI |
| 1994 | 73 | 7.1 | (5.5-8.7) | 19 | 2 | (1.1-2.9) |
| 1995 | 60 | 5.8 | (4.3-7.3) | 18 | 1.9 | (1.0-2.8) |
| 1996 | 30 | 2.9 | (1.9-3.9) | 6 | 0.6 | (0.1-1.1) |
| 1997 | 43 | 4.1 | (2.9-5.3) | 4 | 0.4 | (0.0-0.8) |
| 1998 | 50 | 4.8 | (3.5-6.1) | 10 | 1 | (0.4-1.6) |
| 1999 | 48 | 4.6 | (3.3-5.9) | 10 | 1 | (0.4-1.6) |
| 2000 | 53 | 5.1 | (3.7-6.5) | 17 | 1.7 | (0.9-2.5) |
| 2001 | 68 | 6.5 | (5.0-8.0) | 28 | 2.9 | (1.8-4.0) |
| 2002 | 60 | 5.7 | (4.3-7.1) | 30 | 3.1 | (2.0-4.2) |
| 2003 | 68 | 6.4 | (4.9-7.9) | 22 | 2.2 | (1.3-3.1) |
| 2004 | 99 | 9.5 | (7.6-11.4) | 36 | 3.7 | (2.5-4.9) |
| 2005 | 77 | 7.4 | (5.8-9.0) | 27 | 2.8 | (1.8-3.8) |
| 2006 | 86 | 8.2 | (6.5-9.9) | 26 | 2.6 | (1.6-3.6) |
| 2007 | 57 | 5.4 | (4.0-6.8) | 29 | 2.9 | (1.8-4.0) |
| 2008 | 86 | 8.2 | (6.5-9.9) | 20 | 2 | (1.1-2.9) |
| 2009 | 86 | 8.1 | (6.4-9.8) | 30 | 3 | (1.9-4.1) |
| 2010 | 65 | 6.3 | (4.8-7.8) | 25 | 2.5 | (1.5-3.5) |
| 2011 | 37 | 3.6 | (2.5-4.7) | 18 | 1.8 | (1.0-2.6) |
| 2012 | 28 | 2.7 | (1.7-3.7) | 22 | 2.2 | (1.3-3.1) |
| 2013 | 41 | 3.9 | (2.7-5.1) | 54 | 5.4 | (4.0-6.8) |

Gonorrhea by Sex and Race/Ethnicity, Kalamazoo County 1994 - 2013 (continued)

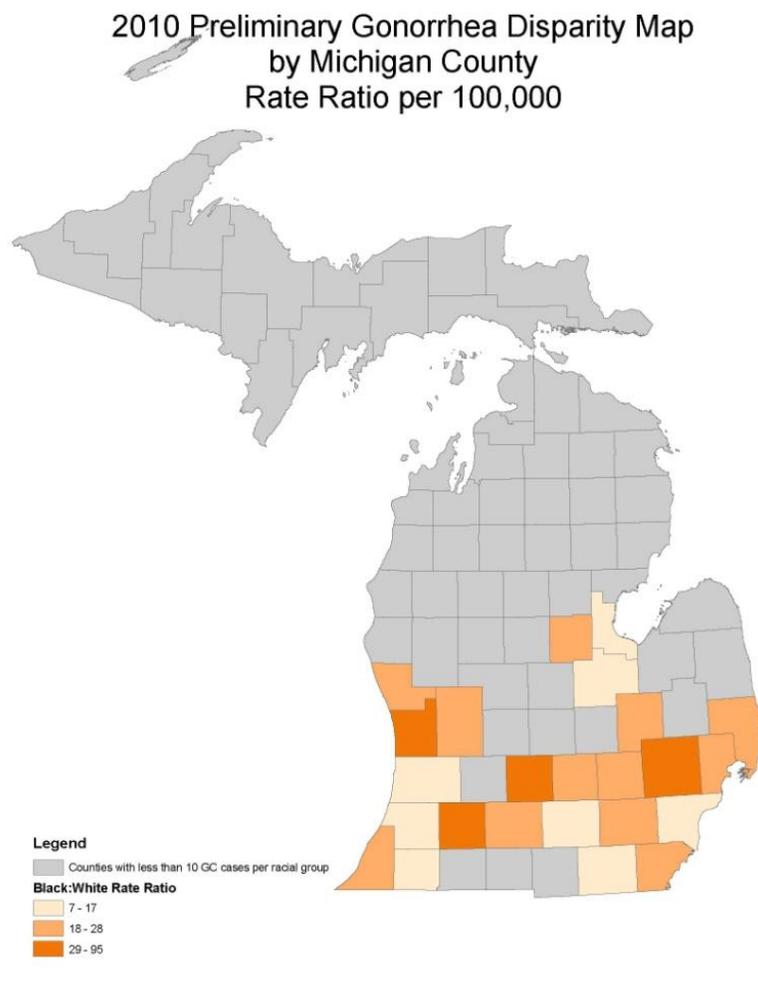
| Year | Black, non-Hispanic females | | | Black, non-Hispanic males | | |
|------|-----------------------------|-----------------|---------------|---------------------------|-----------------|---------------|
| | Cases | Rate per 10,000 | 95% CI | Cases | Rate per 10,000 | 95% CI |
| 1994 | 137 | 118.3 | (98.6-138.0) | 156 | 147.6 | (124.6-170.6) |
| 1995 | 143 | 121 | (101.3-140.7) | 162 | 149.8 | (126.9-172.7) |
| 1996 | 136 | 113.2 | (94.3-132.1) | 114 | 103.7 | (84.8-122.6) |
| 1997 | 118 | 96.7 | (79.3-114.1) | 121 | 107.9 | (88.8-127.0) |
| 1998 | 109 | 87.5 | (71.2-103.8) | 125 | 109.2 | (90.2-128.2) |
| 1999 | 139 | 109.6 | (91.5-127.7) | 153 | 131.1 | (110.5-151.7) |
| 2000 | 126 | 98.2 | (81.1-115.3) | 138 | 116.4 | (97.1-135.7) |
| 2001 | 189 | 146.9 | (126.1-167.7) | 186 | 157.4 | (135.0-179.8) |
| 2002 | 125 | 96.7 | (79.8-113.6) | 156 | 131.5 | (111.0-152.0) |
| 2003 | 209 | 161 | (139.3-182.7) | 230 | 191.6 | (167.1-216.1) |
| 2004 | 216 | 167 | (144.9-189.1) | 183 | 153.4 | (131.3-175.5) |
| 2005 | 195 | 150.6 | (129.6-171.6) | 185 | 154.4 | (132.3-176.5) |
| 2006 | 204 | 156.7 | (135.4-178.0) | 201 | 168.3 | (145.2-191.4) |
| 2007 | 183 | 138.4 | (118.5-158.3) | 160 | 134 | (113.4-154.6) |
| 2008 | 293 | 218.7 | (193.9-243.5) | 282 | 232.4 | (205.6-259.2) |
| 2009 | 237 | 173.3 | (151.4-195.2) | 201 | 163.2 | (140.8-185.6) |
| 2010 | 192 | 125.8 | (108.1-143.5) | 188 | 129 | (110.7-147.3) |
| 2011 | 155 | 100.8 | (85.0-116.6) | 124 | 84.1 | (69.4-98.8) |
| 2012 | 98 | 63.1 | (50.7-75.5) | 97 | 64.9 | (52.0-77.8) |
| 2013 | 68 | 43.7 | (33.3-54.1) | 112 | 75 | (61.2-88.8) |

Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section, Michigan Sexually Transmitted Diseases Database, 1994 – 2004 data; Michigan Disease Surveillance System, 2005 – 2013 data (provisional 2013 data as of 4/8/14).

It is not valid to compare incidence rates by race among counties (or to compare a county rate by race to a Michigan rate by race) due to wide variation in completeness of race data in case reporting and investigation. Counties with missing race data for a higher percentage of cases will appear to have lower rates by race than a county with more complete race reporting. Kalamazoo County has one of the lowest percentages of missing race data in case records in the state. This is important locally so that we can monitor health disparities in rates (inequities), but with a large disparity observed in black vs. white rates, the question often is raised as to how we actually compare with other counties around the state in terms of this disparity.

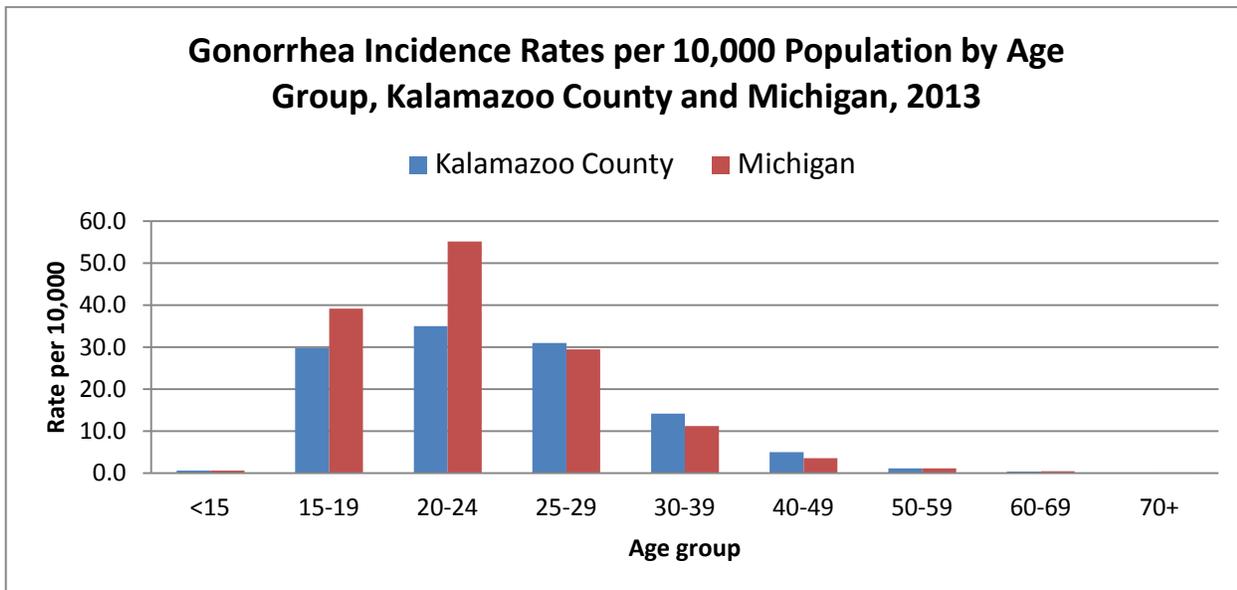
As an alternative measure to comparing *rates*, we can look at the black :white *rate ratio* within counties and compare this county to county, as a measure of disparity. This works as an index because it can be assumed that missing race data is randomly distributed among cases. For example, for a county with 30% of cases missing race data, we can assume that 30% of cases who would have selected white to describe themselves have race blank in their record and 30% of cases who would have selected black have race blank in their record. For this reason, calculating the black to white rate ratio within each county provides a meaningful disparity comparison index among counties.

In the disparity map for gonorrhea in 2010, Kalamazoo is among the counties with the highest disparity ratios.



Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section

Gonorrhea infections are most prevalent among teens and young adults. In Kalamazoo County in 2013, the highest gonorrhea incidence rates were among the population between 20 and 24 years old. Gonorrhea rates among ages 15 to 24 were lower in Kalamazoo County than in Michigan in 2013; rates in all other age groups were similar between Kalamazoo County and Michigan.



Gonorrhea by Age Group in Kalamazoo County and Michigan, 2013

| Age Group | Kalamazoo County | | | Michigan | | |
|-----------|------------------|-----------------|-------------|----------|-----------------|-------------|
| | Number | Rate per 10,000 | 95% CI | Number | Rate per 10,000 | 95% CI |
| <15 | 3 | * | * | 104 | 0.6 | (0.5-0.7) |
| 15-19 | 56 | 29.8 | (22.0-37.6) | 2,734 | 39.2 | (37.7-40.7) |
| 20-24 | 110 | 35 | (28.5-41.5) | 3,939 | 55.2 | (53.5-56.9) |
| 25-29 | 53 | 31 | (22.7-39.3) | 1,739 | 29.5 | (28.1-30.9) |
| 30-39 | 43 | 14.2 | (10.0-18.4) | 1,299 | 11.2 | (10.6-11.8) |
| 40-49 | 15 | 5 | (2.5-7.5) | 487 | 3.6 | (3.3-3.9) |
| 50-59 | 4 | 1.2 | (0.0-2.4) | 177 | 1.2 | (1.0-1.4) |
| 60-69 | 1 | * | * | 56 | 0.5 | (0.4-0.6) |
| 70+ | 0 | 0 | (0.0-0.0) | 24 | 0.2 | (0.1-0.3) |

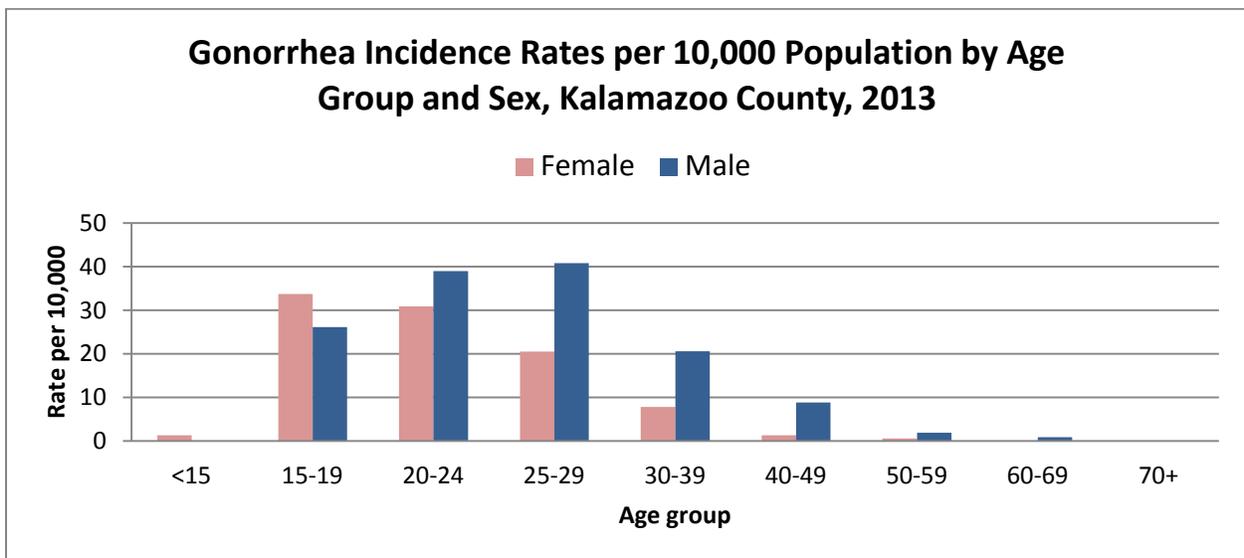
*Rate not shown, confidence interval exceeds possible limits.

Source: Michigan Disease Surveillance System, provisional data as of 4/8/2014.

In Kalamazoo County in 2013, teen (15 to 19 years old) gonorrhea rates were higher among females than males. Rates were higher among males in all other age groups except for <15 year-olds.

Among females aged 15 to 44 years, the gonorrhea new infection rate in 2013 was 19.5 cases per 10,000 population. Among males in this same age group, the new infection rate was 28.5 per 10,000 population. Rates in both of these populations were higher than the Healthy People 2020 Goals.

Healthy People 2020 Goal
 Reduce gonorrhea rates among males and females 15-44 years old: reduce rates **among males to 19.5 cases per 10,000 population and among females to 25.2 cases per 10,000 population.**



Gonorrhea by Age Group and Sex, Kalamazoo County, 2013

| Age Group | Female | | | Male | | |
|-----------|--------|-----------------|-------------|--------|-----------------|-------------|
| | Number | Rate per 10,000 | 95% CI | Number | Rate per 10,000 | 95% CI |
| <15 | 3 | 1.3 | * | 0 | 0 | (0.0-0.0) |
| 15-19 | 31 | 33.7 | (21.9-45.5) | 25 | 26.1 | (15.9-36.3) |
| 20-24 | 48 | 30.9 | (22.2-39.6) | 62 | 39 | (29.3-48.7) |
| 25-29 | 17 | 20.5 | (10.8-30.2) | 36 | 40.8 | (27.5-54.1) |
| 30-39 | 12 | 7.8 | (3.4-12.2) | 31 | 20.6 | (13.3-27.9) |
| 40-49 | 2 | * | * | 13 | 8.8 | (4.0-13.6) |
| 50-59 | 1 | * | * | 3 | * | * |
| 60-69 | 0 | 0 | (0.0-0.0) | 1 | 0.9 | * |
| 70+ | 0 | 0 | (0.0-0.0) | 0 | 0 | (0.0-0.0) |

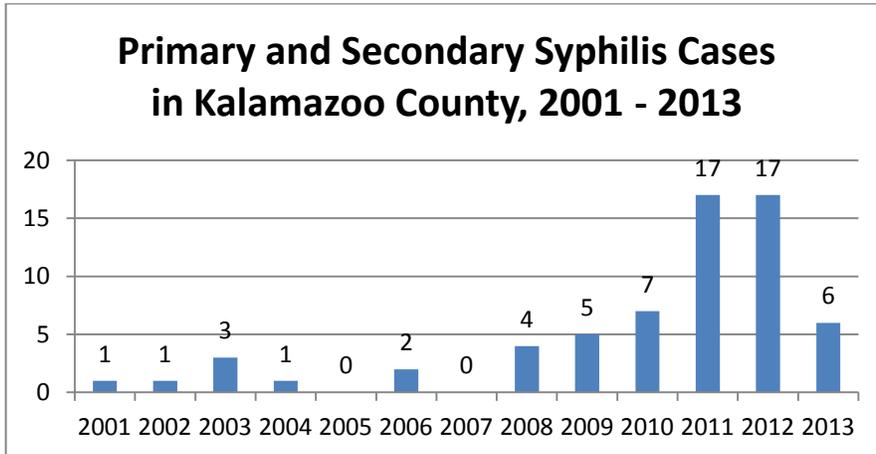
*Rate not shown, confidence interval exceeds possible limits.

Source: Michigan Disease Surveillance System, provisional data as of 4/8/2014.

6.3.3 Syphilis

The incidence of syphilis is low in comparison to other sexually transmitted infections in Kalamazoo County. Between 2001 and 2009, there were on average 1.9 primary or secondary syphilis cases reported per year in Kalamazoo County. Since 2008, the number of primary and secondary cases reported has increased each year, to a high of 17 cases in 2011 and 2012. In 2013 reported cases decreased to 6.

Healthy People
2020 Goal
Reduce sustained domestic transmission of primary and secondary syphilis: reduce annual incidence **among females to 1.4 cases per 100,000 population and among males to 6.8 cases per 100,000 population.**



The Healthy People 2020 Goals related to primary and secondary syphilis are divided into target rates for males and for females. In 2013, the rate in Kalamazoo of new cases among females of 0.0 per 100,000 population was below the target rate of 1.4 per 100,000 females. Among males, the rate in Kalamazoo of 4.8 per 100,000 population was below the target rate of 6.8 per 100,000 males.

Rates in Kalamazoo County have been lower than rates in Michigan in recent years, but in 2011 and 2012 the rate in Kalamazoo County was significantly higher than the rate in Michigan. In 2013 Kalamazoo County rates returned to below state rates.

Primary and Secondary Syphilis Cases in Kalamazoo and Michigan, 2001-2009 Averages and 2010-2103

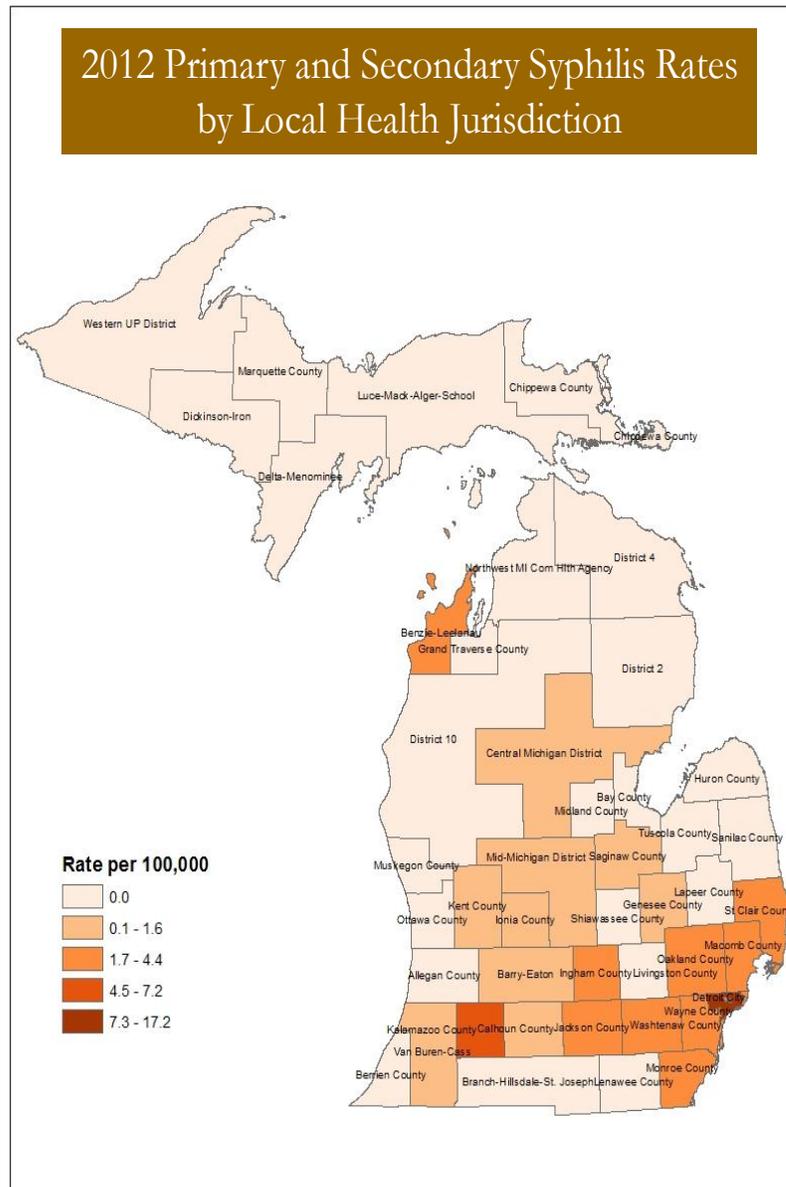
| Time Period | Kalamazoo County | | Michigan | |
|-------------|-----------------------------|----------------------------------|-----------------------------|----------------------------------|
| | Average # of cases per year | Average annual rate per 100,000* | Average # of cases per year | Average annual rate per 100,000* |
| 2001-2009 | 1.9 | 0.8 | 456.6 | 4.5 |
| | # of cases per year | Rate per 100,000* | # of cases per year | Rate per 100,000* |
| 2010 | 7 | 2.8 | 252 | 2.6 |
| 2011 | 17 | 6.7 | 286 | 2.9 |
| 2012 | 17 | 6.7 | 304 | 3.1 |
| 2013 | 6 | 2.4 | 499 | 5.0 |

*Note that rates are per 100,000 population rather than per 10,000 population as chlamydia and gonorrhea rates were shown in preceding sections; this is because syphilis cases are relatively rare.

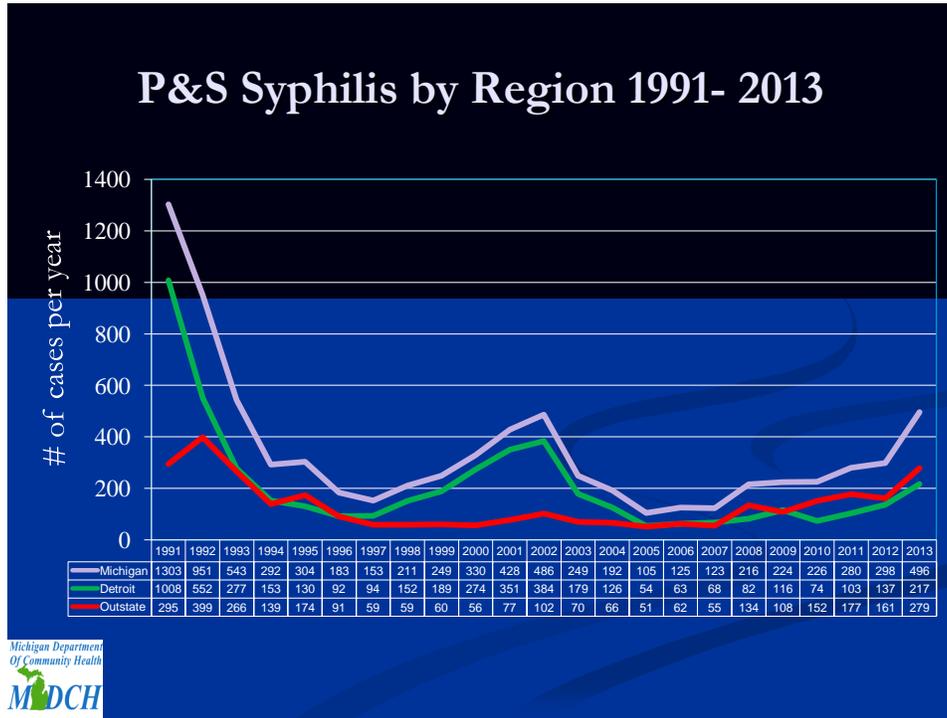
**Confidence interval exceeds possible limits.

Kalamazoo STI Source: Michigan Disease Surveillance System, provisional data as of 4/14/2014.

Compared with other local health jurisdictions in Michigan, Kalamazoo County had the second highest rate of primary or secondary syphilis incidence 2012 (after the City of Detroit).

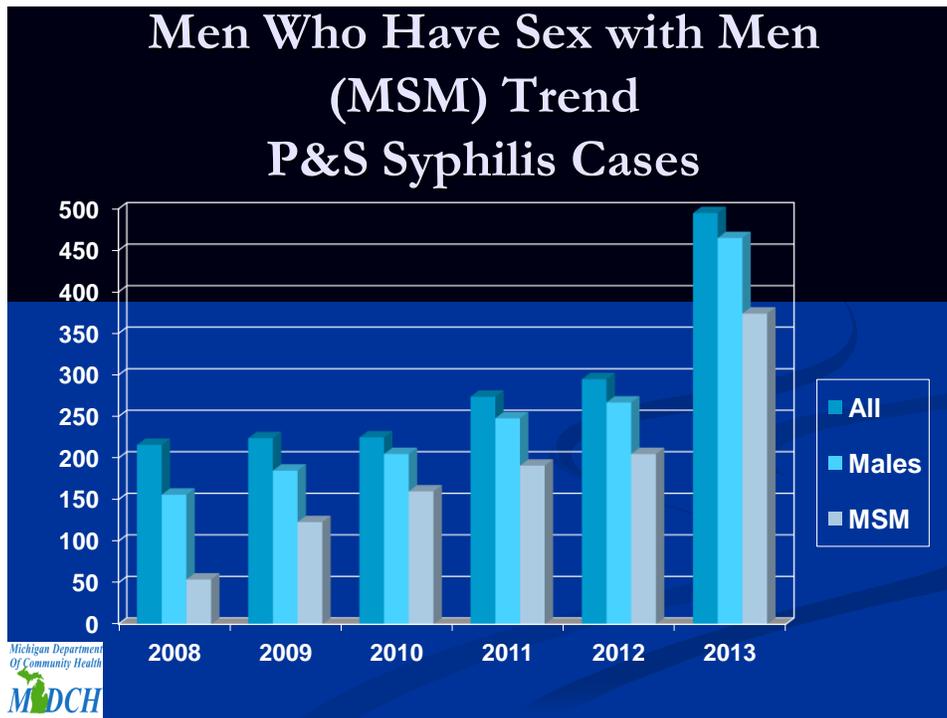


Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section



Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section

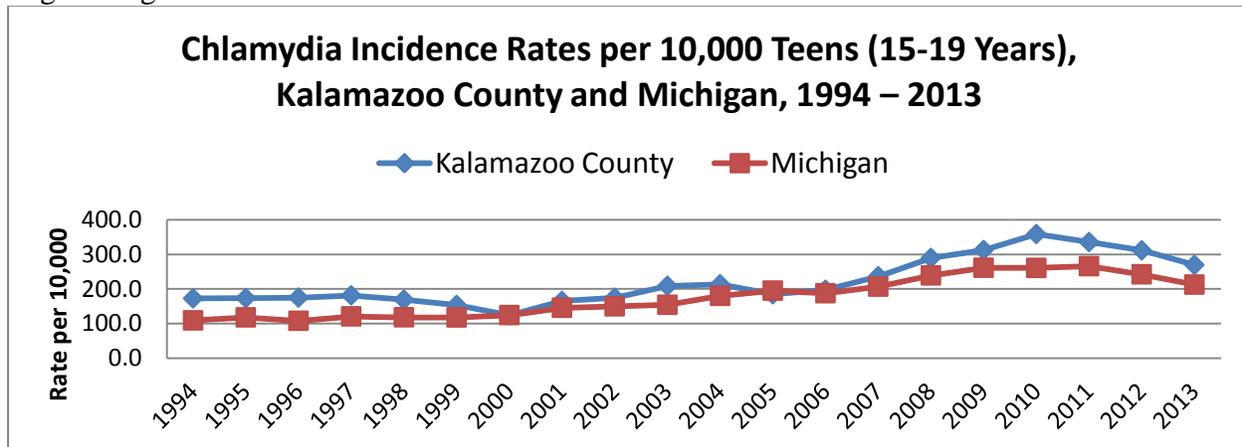
Statewide Syphilis rates have been significantly higher among men who have sex with men (MSM) than in men who have sex with women.



Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section

6.3.4 Teens

Chlamydia rates among teens in Kalamazoo County have been significantly higher or similar to rates among teens in Michigan between 1994 and 2013. From 2006 through 2010, rates among teens in the county increased each year, reaching a high rate of 358.7 per 10,000 in 2010. For the past five years, the chlamydia rate among teens in Kalamazoo County has been significantly higher than the rate among Michigan teens.

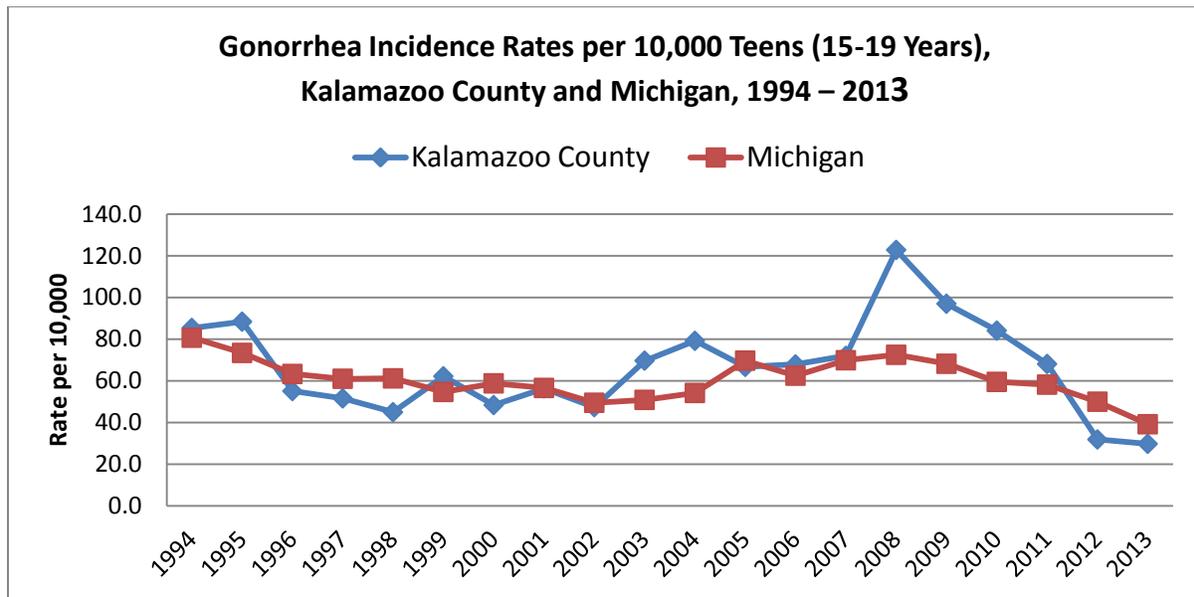


Chlamydia Among Teens (15 – 19 Years) in Kalamazoo County and Michigan, 1994 – 2013

| Year | Kalamazoo County | | | Michigan | | |
|------|------------------|-----------------|---------------|----------|-----------------|---------------|
| | Number | Rate per 10,000 | 95% CI | Number | Rate per 10,000 | 95% CI |
| 1994 | 301 | 172.5 | (153.0-192.0) | 7,041 | 109.0 | (106.5-111.5) |
| 1995 | 312 | 173.5 | (156.7-190.3) | 7,775 | 117.7 | (115.1-120.3) |
| 1996 | 327 | 175.0 | (160.2-189.8) | 7,343 | 107.9 | (105.4-110.4) |
| 1997 | 348 | 181.4 | (166.8-196.0) | 8,380 | 120.6 | (118.0-123.2) |
| 1998 | 334 | 169.1 | (154.9-183.3) | 8,337 | 118.0 | (115.5-120.5) |
| 1999 | 309 | 153.6 | (140.1-167.1) | 8,394 | 117.5 | (115.0-120.0) |
| 2000 | 253 | 123.7 | (111.1-136.3) | 8,982 | 124.4 | (121.8-127.0) |
| 2001 | 354 | 165.1 | (149.8-180.4) | 10,533 | 145.5 | (142.7-148.3) |
| 2002 | 379 | 174.5 | (158.4-190.6) | 10,858 | 149.7 | (146.9-152.5) |
| 2003 | 456 | 209.0 | (190.9-227.1) | 11,251 | 154.1 | (151.3-156.9) |
| 2004 | 450 | 213.5 | (194.6-232.4) | 13,229 | 179.9 | (176.9-182.9) |
| 2005 | 387 | 184.4 | (164.6-204.2) | 14,542 | 195.1 | (192.0-198.2) |
| 2006 | 410 | 197.6 | (179.6-215.6) | 14,082 | 187.6 | (184.5-190.7) |
| 2007 | 490 | 236.7 | (215.7-257.7) | 15,588 | 206.7 | (203.5-209.9) |
| 2008 | 606 | 289.6 | (266.5-312.7) | 17,885 | 239.1 | (235.6-242.6) |
| 2009 | 651 | 312.6 | (288.9-336.3) | 19,260 | 261.3 | (257.7-264.9) |
| 2010 | 695 | 358.7 | (332.2-385.2) | 19,185 | 260.8 | (257.2-264.4) |
| 2011 | 631 | 335.5 | (311.0-360.0) | 19,018 | 265.9 | (262.2-269.6) |
| 2012 | 585 | 311.5 | (287.2-335.8) | 16,886 | 242.3 | (238.7-245.9) |
| 2013 | 506 | 269.4 | (248.1-290.7) | 14,819 | 212.6 | (209.2-216.0) |

Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section, Michigan Sexually Transmitted Diseases Database, 1994 – 2004 data; Michigan Disease Surveillance System, 2005 - 2013 data (provisional 2013 data as of 4/8/2014).

Gonorrhea rates among teens in Kalamazoo County followed trends similar to rates among teens in Michigan from the mid-1990s through 2002. After several years of declining or stable rates, however, rates in Kalamazoo County in 2003 and 2004 increased while rates in Michigan remained stable. From 2005 through 2007, rates of gonorrhea infection among teens declined and were again similar to statewide rates. After a steep rate increase in 2008 among Kalamazoo County teens, rates have subsequently declined in Kalamazoo County, and in 2011 the rate was similar to the rate among teens in Michigan. In 2012 and 2013 the rate has been lower than the rate among teens statewide.

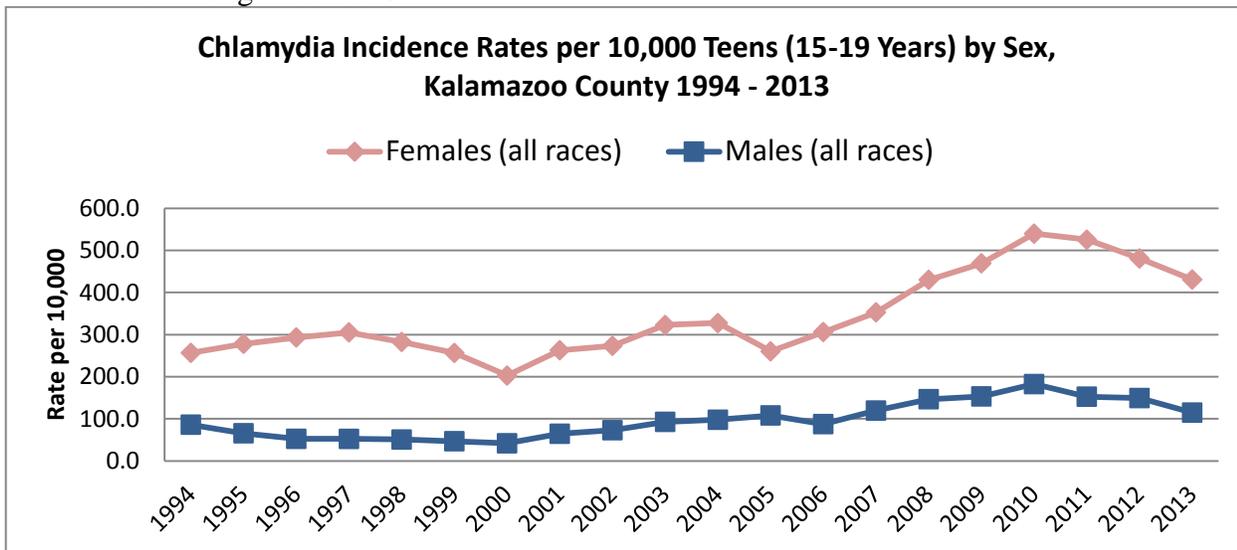


Gonorrhea Among Teens (15 – 19 Years) in Kalamazoo County and Michigan, 1994 – 2013

| Year | Kalamazoo County | | | Michigan | | |
|------|------------------|-----------------|---------------|----------|-----------------|-------------|
| | Number | Rate per 10,000 | 95% CI | Number | Rate per 10,000 | 95% CI |
| 1994 | 149 | 85.4 | (71.7-99.1) | 5,212 | 80.7 | (78.5-82.9) |
| 1995 | 159 | 88.4 | (74.7-102.1) | 4,849 | 73.4 | (71.3-75.5) |
| 1996 | 103 | 55.1 | (44.5-65.7) | 4,308 | 63.3 | (61.4-65.2) |
| 1997 | 99 | 51.6 | (41.5-61.7) | 4,236 | 61.0 | (59.2-62.8) |
| 1998 | 89 | 45.0 | (35.7-54.3) | 4,321 | 61.2 | (59.4-63.0) |
| 1999 | 125 | 62.2 | (51.3-73.1) | 3,907 | 54.7 | (53.0-56.4) |
| 2000 | 99 | 48.4 | (38.9-57.9) | 4,245 | 58.8 | (57.0-60.6) |
| 2001 | 121 | 56.4 | (46.4-66.4) | 4,101 | 56.6 | (54.9-58.3) |
| 2002 | 103 | 47.4 | (38.3-56.5) | 3,589 | 49.5 | (47.9-51.1) |
| 2003 | 152 | 69.7 | (58.7-80.7) | 3,718 | 50.9 | (49.3-52.5) |
| 2004 | 167 | 79.2 | (67.2-91.2) | 3,983 | 54.2 | (52.5-55.9) |
| 2005 | 140 | 66.7 | (55.7-77.7) | 5,197 | 69.7 | (67.8-71.6) |
| 2006 | 141 | 67.9 | (56.7-79.1) | 4,692 | 62.5 | (60.7-64.3) |
| 2007 | 149 | 72.0 | (60.5-83.5) | 5,268 | 69.9 | (68.0-71.8) |
| 2008 | 257 | 122.8 | (107.9-137.7) | 5,425 | 72.5 | (70.6-74.4) |
| 2009 | 202 | 97.0 | (83.7-110.3) | 5,025 | 68.2 | (66.3-70.1) |
| 2010 | 163 | 84.1 | (71.2-97.0) | 4,377 | 59.5 | (57.7-61.3) |
| 2011 | 128 | 68.1 | (56.3-79.9) | 4,162 | 58.2 | (56.4-60.0) |
| 2012 | 60 | 31.9 | (23.8-40.0) | 3,484 | 50.0 | (48.3-51.7) |
| 2013 | 56 | 29.8 | (22.0-37.6) | 2,734 | 39.2 | (37.7-40.7) |

Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section, Michigan Sexually Transmitted Diseases Database, 1994 – 2004 data; Michigan Disease Surveillance System, 2005 - 2013 data (provisional 2013 data as of 4/8/2014).

Chlamydia rates among female teens have increased steadily each year from 2005 through 2010. The rate among female teens in 2010 was the highest rate seen over the past seventeen years. Rates among male teens remain well below rates among female teens; however, the rate among male teens has been increasing overall since 2000. In 2013, the Chlamydia rate among female teens was 3.8 times higher than the rate among male teens.

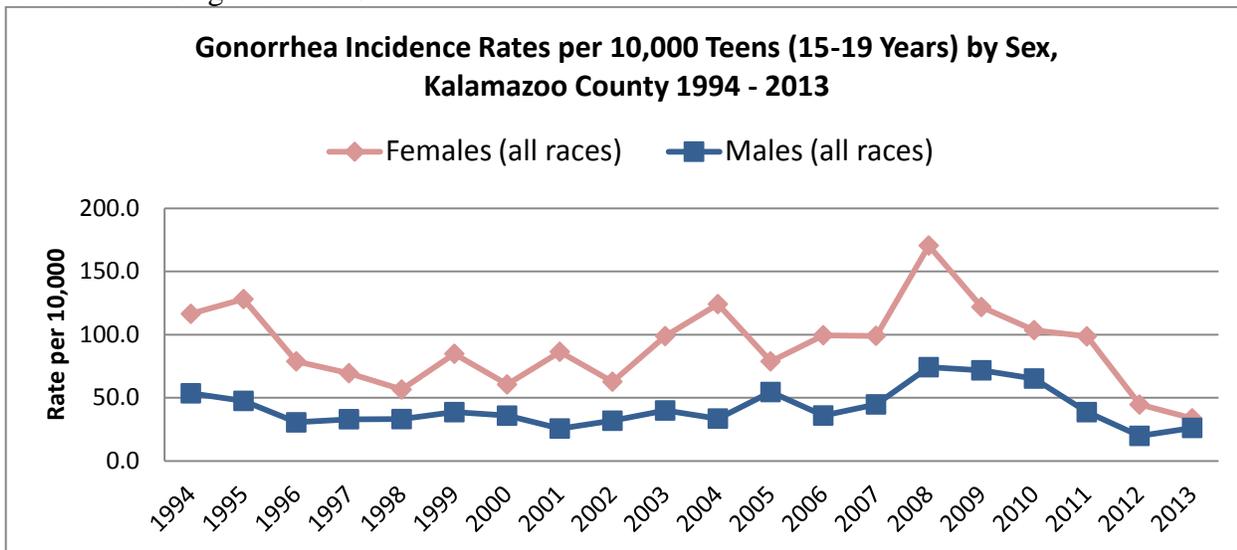


Chlamydia Among Teens (15 – 19 Years) by Sex, Kalamazoo County, 1994 –2013

| Year | Females | | | Males | | |
|------|---------|-----------------|---------------|-------|-----------------|---------------|
| | Cases | Rate per 10,000 | 95% CI | Cases | Rate per 10,000 | 95% CI |
| 1994 | 227 | 256.6 | (223.7-289.5) | 74 | 86.0 | (66.5-105.5) |
| 1995 | 254 | 278.1 | (244.4-311.8) | 58 | 65.6 | (48.8-82.4) |
| 1996 | 279 | 293.2 | (259.3-327.1) | 48 | 52.4 | (37.6-67.2) |
| 1997 | 299 | 305.3 | (271.2-339.4) | 49 | 52.2 | (37.6-66.8) |
| 1998 | 285 | 282.5 | (250.2-314.8) | 49 | 50.7 | (36.5-64.9) |
| 1999 | 263 | 256.4 | (225.8-287.0) | 46 | 46.7 | (33.2-60.2) |
| 2000 | 211 | 202.7 | (175.6-229.8) | 42 | 41.8 | (29.2-54.4) |
| 2001 | 286 | 262.7 | (232.7-292.7) | 68 | 64.4 | (49.1-79.7) |
| 2002 | 301 | 273.3 | (242.8-303.8) | 78 | 72.9 | (56.8-89.0) |
| 2003 | 356 | 322.7 | (289.7-355.7) | 100 | 92.7 | (74.6-110.8) |
| 2004 | 348 | 327.3 | (293.5-361.1) | 102 | 97.7 | (78.8-116.6) |
| 2005 | 274 | 260.2 | (229.8-290.6) | 113 | 108.0 | (88.2-127.8) |
| 2006 | 320 | 306.0 | (273.0-339.0) | 90 | 87.4 | (69.4-105.4) |
| 2007 | 367 | 352.9 | (317.4-388.4) | 123 | 119.5 | (98.5-140.5) |
| 2008 | 454 | 430.0 | (391.3-468.7) | 152 | 146.5 | (123.4-169.6) |
| 2009 | 493 | 469.3 | (428.9-509.7) | 158 | 153.1 | (129.4-176.8) |
| 2010 | 516 | 539.6 | (494.3-584.9) | 179 | 182.4 | (155.9-208.9) |
| 2011 | 485 | 525.3 | (479.8-570.8) | 146 | 152.5 | (128.0-177.0) |
| 2012 | 442 | 480.7 | (437.0-524.4) | 143 | 149.2 | (124.9-173.5) |
| 2013 | 396 | 430.7 | (389.2-472.2) | 110 | 114.7 | (93.4-136.0) |

Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section, Michigan Sexually Transmitted Diseases Database, 1994 – 2004 data; Michigan Disease Surveillance System, 2005 – 2013 data (provisional 2013 data as of 4/8/2014).

As with chlamydia incidence rates, gonorrhea rates have consistently been higher among female teens in Kalamazoo County than among male teens. Since 1994, rates among male teens have been fairly stable while rates among female teens have fluctuated. The rate among female teens increased significantly in 2008 then declined in each year after. In 2013, the rate among female teens was similar to the rate among male teens.



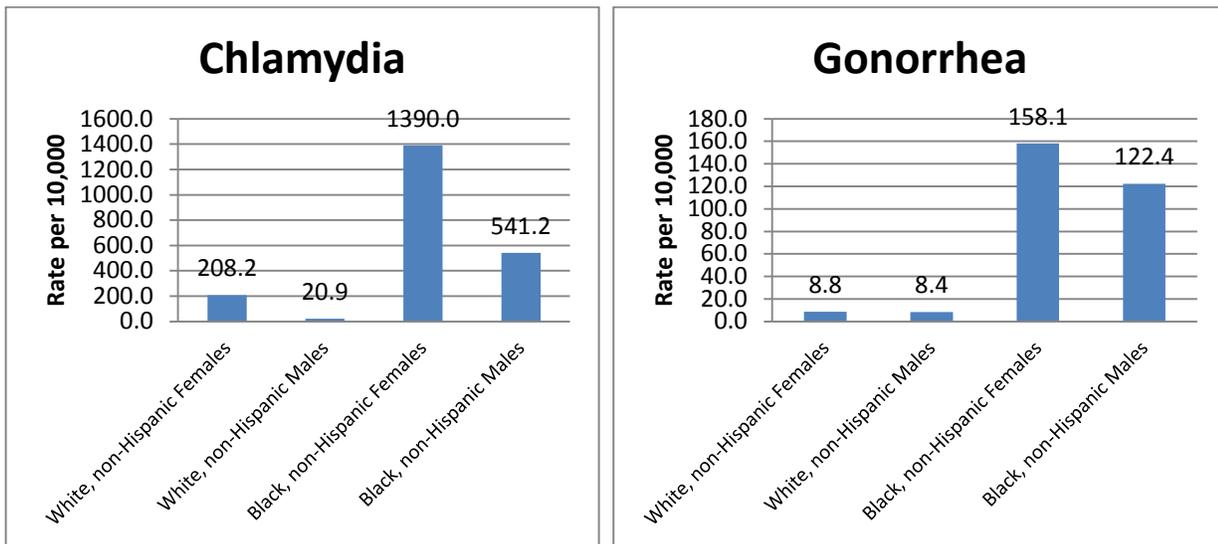
Gonorrhea Among Teens (15 – 19 Years) by Sex, Kalamazoo County, 1994 – 2013

| Year | Females | | | Males | | |
|------|---------|-----------------|---------------|-------|-----------------|-------------|
| | Cases | Rate per 10,000 | 95% CI | Cases | Rate per 10,000 | 95% CI |
| 1994 | 103 | 116.4 | (94.0-138.8) | 46 | 53.5 | (38.1-68.9) |
| 1995 | 117 | 128.1 | (105.0-151.2) | 42 | 47.5 | (33.2-61.8) |
| 1996 | 75 | 78.8 | (61.0-96.6) | 28 | 30.5 | (19.2-41.8) |
| 1997 | 68 | 69.4 | (53.0-85.8) | 31 | 33.0 | (21.4-44.6) |
| 1998 | 57 | 56.5 | (41.9-71.1) | 32 | 33.1 | (21.6-44.6) |
| 1999 | 87 | 84.8 | (67.1-102.5) | 38 | 38.6 | (26.4-50.8) |
| 2000 | 63 | 60.5 | (45.6-75.4) | 36 | 35.8 | (24.1-47.5) |
| 2001 | 94 | 86.4 | (69.0-103.8) | 27 | 25.6 | (16.0-35.2) |
| 2002 | 69 | 62.7 | (48.0-77.4) | 34 | 31.8 | (21.1-42.5) |
| 2003 | 109 | 98.8 | (80.3-117.3) | 43 | 39.9 | (28.0-51.8) |
| 2004 | 132 | 124.1 | (103.1-145.1) | 35 | 33.5 | (22.4-44.6) |
| 2005 | 83 | 78.8 | (61.9-95.7) | 57 | 54.5 | (40.4-68.6) |
| 2006 | 104 | 99.5 | (80.5-118.5) | 37 | 35.9 | (24.3-47.5) |
| 2007 | 103 | 99.0 | (80.0-118.0) | 46 | 44.7 | (31.8-57.6) |
| 2008 | 180 | 170.5 | (145.8-195.2) | 77 | 74.2 | (57.7-90.7) |
| 2009 | 128 | 121.8 | (100.8-142.8) | 74 | 71.7 | (55.4-88.0) |
| 2010 | 99 | 103.5 | (83.2-123.8) | 64 | 65.2 | (49.3-81.1) |
| 2011 | 91 | 98.6 | (78.4-118.8) | 37 | 38.6 | (26.2-51.0) |
| 2012 | 41 | 44.6 | (31.0-58.2) | 19 | 19.8 | (10.9-28.7) |
| 2013 | 31 | 33.7 | (21.9-45.5) | 25 | 26.1 | (15.9-36.3) |

Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section, Michigan Sexually Transmitted Diseases Database, 1994 – 2004 data; Michigan Disease Surveillance System, 2005 - 2013 data (provisional 2013 data as of 4/8/2014).

The disparity in STI incidence rates among teens by sex and race is larger than the disparity by sex alone. In Kalamazoo County in 2013, the chlamydia incidence rate among black, non-Hispanic female teens was 6.7 times higher than the rate among white, non-Hispanic female teens. Gonorrhea rates were 18.0 times higher among black female teens than white female teens. Although teen STI rates among black non-Hispanic males were lower than rates among black non-Hispanic females for both chlamydia and gonorrhea, the relative disparity in rates between black non-Hispanic males and white non-Hispanic males was larger than between black non-Hispanic females and white non-Hispanic females. The chlamydia rate among black non-Hispanic male teens was 25.9 times higher than the rate among white non-Hispanic male teens. For gonorrhea, the rate was 14.6 times higher among black non-Hispanic male teens than among their white counterparts.

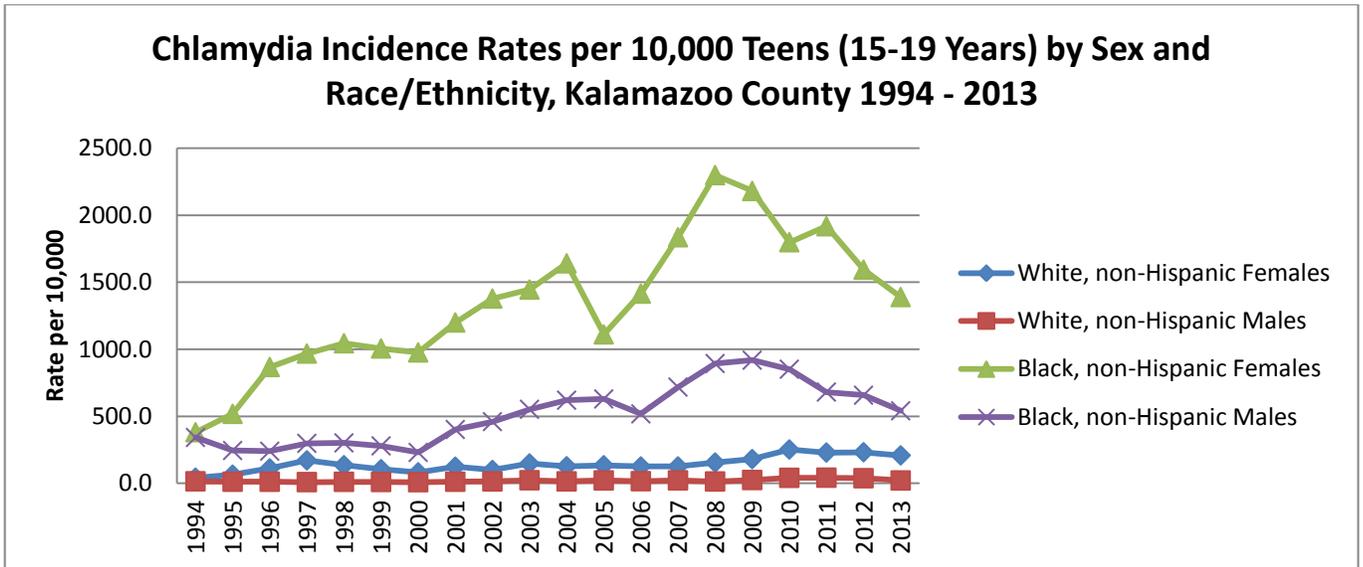
Chlamydia and Gonorrhea Rates per 10,000 Teens (15-19 Years) by Sex and Race/Ethnicity, Kalamazoo County 2013



Source: Michigan Disease Surveillance System, provisional data as of 4/8/2014.

Disparities in chlamydia rates among teens by sex and race have persisted over time in Kalamazoo County. The chlamydia rate among black, non-Hispanic female teens (the group with the highest excess morbidity due to chlamydia) has increased overall between 1994 and 2008, but since 2008 has trended down.

The chlamydia rate among black, non-Hispanic male teens has steadily increased from 2000 through 2008. Since 2008 it has been declining. The disparity (measured by calculating the ratio of rates) for chlamydia incidence persists over time between white, non-Hispanic and black, non-Hispanic teens.



Chlamydia Among Teens (15-19 Years) by Sex and Race/Ethnicity, Kalamazoo County 1994 - 2013

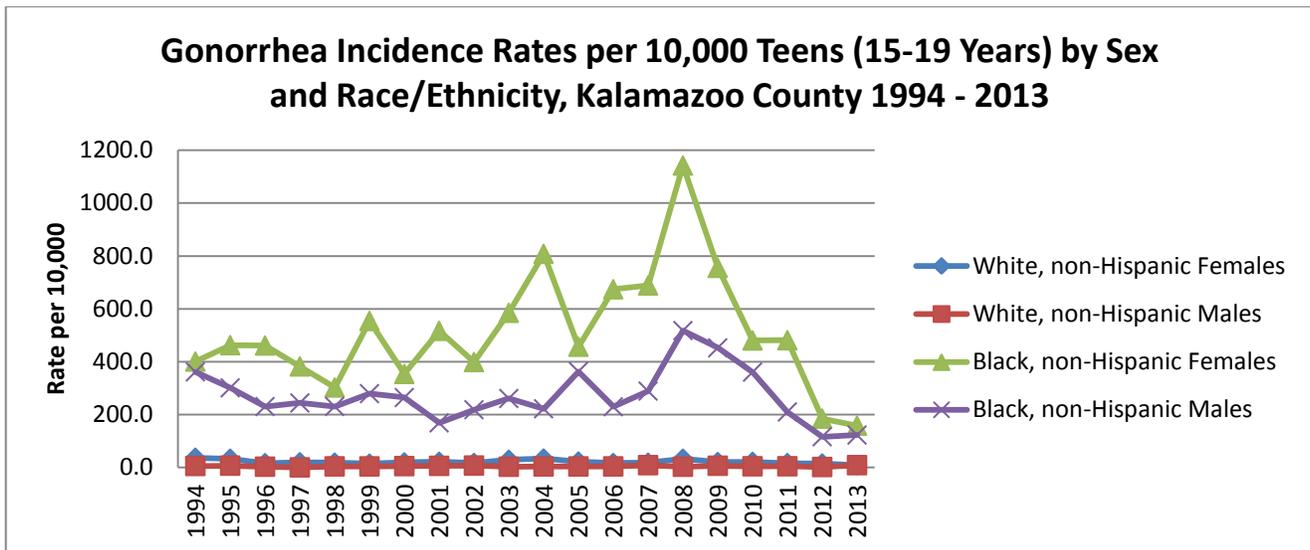
| Year | White, non-Hispanic females | | | White, non-Hispanic males | | |
|------|-----------------------------|-----------------|---------------|---------------------------|-----------------|-------------|
| | Cases | Rate per 10,000 | 95% CI | Cases | Rate per 10,000 | 95% CI |
| 1994 | 32 | 41.5 | (27.2-55.8) | 11 | 14.6 | (6.0-23.2) |
| 1995 | 51 | 64.2 | (46.6-81.8) | 9 | 11.6 | (4.0-19.2) |
| 1996 | 91 | 111.0 | (88.3-133.7) | 9 | 11.3 | (3.9-18.7) |
| 1997 | 142 | 171.0 | (143.1-198.9) | 7 | 8.7 | (2.3-15.1) |
| 1998 | 114 | 134.8 | (110.2-159.4) | 9 | 11.0 | (3.8-18.2) |
| 1999 | 90 | 105.2 | (83.6-126.8) | 8 | 9.7 | (3.0-16.4) |
| 2000 | 70 | 81.5 | (62.5-100.5) | 7 | 8.4 | (2.2-14.6) |
| 2001 | 111 | 123.7 | (100.8-146.6) | 10 | 11.5 | (4.4-18.6) |
| 2002 | 90 | 99.1 | (78.7-119.5) | 12 | 13.7 | (6.0-21.4) |
| 2003 | 134 | 147.9 | (123.1-172.7) | 20 | 22.6 | (12.7-32.5) |
| 2004 | 111 | 126.9 | (103.4-150.4) | 12 | 14.1 | (6.1-22.1) |
| 2005 | 117 | 134.6 | (110.4-158.8) | 18 | 21.2 | (11.4-31.0) |
| 2006 | 108 | 125.5 | (102.0-149.0) | 13 | 15.6 | (7.1-24.1) |
| 2007 | 107 | 125.8 | (102.1-149.5) | 18 | 21.7 | (11.7-31.7) |
| 2008 | 133 | 154.8 | (128.7-180.9) | 11 | 13.2 | (5.4-21.0) |
| 2009 | 153 | 180.3 | (152.0-208.6) | 20 | 24.3 | (13.7-34.9) |
| 2010 | 182 | 252.2 | (216.0-288.4) | 30 | 40.6 | (26.1-55.1) |
| 2011 | 157 | 229.4 | (193.9-264.9) | 30 | 41.7 | (26.8-56.6) |
| 2012 | 158 | 231.6 | (195.9-267.3) | 27 | 37.6 | (23.4-51.8) |
| 2013 | 142 | 208.2 | (174.3-242.1) | 15 | 20.9 | (10.3-31.5) |

Chlamydia Among Teens (15-19 Years) by Sex and Race/Ethnicity, Kalamazoo County 1994 - 2013 (continued)

| Year | Black, non-Hispanic females | | | Black, non-Hispanic males | | |
|------|-----------------------------|-----------------|-------------------|---------------------------|-----------------|-----------------|
| | Cases | Rate per 10,000 | 95% CI | Cases | Rate per 10,000 | 95% CI |
| 1994 | 40 | 381.3 | (265.4-497.2) | 35 | 341.8 | (230.5-453.1) |
| 1995 | 56 | 518.0 | (385.9-650.1) | 26 | 244.6 | (151.7-337.5) |
| 1996 | 96 | 868.0 | (702.1-1,033.9) | 26 | 239.4 | (148.5-330.3) |
| 1997 | 109 | 968.0 | (795.3-1,140.7) | 33 | 298.1 | (197.9-398.3) |
| 1998 | 121 | 1044.9 | (868.7-1,221.1) | 34 | 301.4 | (201.6-401.2) |
| 1999 | 118 | 1006.0 | (833.9-1,178.1) | 32 | 279.0 | (183.7-374.3) |
| 2000 | 116 | 976.4 | (807.6-1,145.2) | 27 | 230.2 | (144.4-316.0) |
| 2001 | 144 | 1200.0 | (1,016.1-1,383.9) | 50 | 401.3 | (292.3-510.3) |
| 2002 | 166 | 1378.7 | (1,184.0-1,573.4) | 59 | 459.9 | (345.3-574.5) |
| 2003 | 178 | 1446.0 | (1,249.5-1,642.5) | 72 | 552.1 | (428.1-676.1) |
| 2004 | 195 | 1641.4 | (1,430.8-1,852.0) | 81 | 619.7 | (489.0-750.4) |
| 2005 | 129 | 1111.1 | (930.3-1,291.9) | 85 | 629.2 | (499.7-758.7) |
| 2006 | 168 | 1415.3 | (1,217.0-1,613.6) | 70 | 518.1 | (399.9-636.3) |
| 2007 | 224 | 1836.1 | (1,618.8-2,053.4) | 97 | 718.0 | (580.3-855.7) |
| 2008 | 296 | 2299.9 | (2,070.0-2,529.8) | 126 | 893.6 | (744.7-1,042.5) |
| 2009 | 286 | 2181.5 | (1,957.9-2,405.1) | 130 | 918.7 | (768.2-1,069.2) |
| 2010 | 281 | 1799.0 | (1,608.5-1,989.5) | 137 | 851.5 | (715.1-987.9) |
| 2011 | 291 | 1918.3 | (1,720.2-2,116.4) | 107 | 680.7 | (556.2-805.2) |
| 2012 | 242 | 1594.2 | (1,410.0-1,778.4) | 102 | 657.2 | (533.9-780.5) |
| 2013 | 211 | 1390.0 | (1,216.0-1,564.0) | 84 | 541.2 | (428.6-653.8) |

Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section, Michigan Sexually Transmitted Diseases Database, 1994 – 2004 data; Michigan Disease Surveillance System, 2005 - 2013 data (provisional 2013 data as of 4/8/14).

Disparities in gonorrhea rates among teens by sex and race have also persisted over time in Kalamazoo County. As with chlamydia rates, a sharp decline in gonorrhea rates among black female teens occurred between 2004 and 2005 which was followed by an increase in this group from 2006 through 2008. Rates among black male teens had been stable over the past fourteen years until a significant increase in 2008 (followed by a decrease). Decreasing rates for black non-Hispanic males and females leveled off in 2012. Rates among white female and male teens remained stable over the past fourteen years.



Gonorrhea Among Teens (15-19 Years) by Sex and Race/Ethnicity, Kalamazoo County 1994 - 2013

| Year | White, non-Hispanic females | | | White, non-Hispanic males | | |
|------|-----------------------------|-----------------|-------------|---------------------------|-----------------|------------|
| | Cases | Rate per 10,000 | 95% CI | Cases | Rate per 10,000 | 95% CI |
| 1994 | 28 | 36.3 | (22.9-49.7) | 4 | 5.3 | (0.1-10.5) |
| 1995 | 26 | 32.7 | (20.1-45.3) | 5 | 6.5 | (0.8-12.2) |
| 1996 | 13 | 15.9 | (7.3-24.5) | 2 | * | * |
| 1997 | 16 | 19.3 | (9.9-28.7) | 0 | 0.0 | (0.0-0.0) |
| 1998 | 15 | 17.7 | (8.7-26.7) | 3 | * | * |
| 1999 | 12 | 14.0 | (6.1-21.9) | 3 | * | * |
| 2000 | 16 | 18.6 | (9.5-27.7) | 4 | 4.8 | (0.1-9.5) |
| 2001 | 19 | 21.2 | (11.7-30.7) | 5 | 5.7 | (0.7-10.7) |
| 2002 | 15 | 16.5 | (8.1-24.9) | 6 | 6.8 | (1.3-12.3) |
| 2003 | 26 | 28.7 | (17.7-39.7) | 2 | * | * |
| 2004 | 29 | 33.2 | (21.2-45.2) | 3 | * | * |
| 2005 | 19 | 21.9 | (12.1-31.7) | 3 | * | * |
| 2006 | 14 | 16.3 | (7.8-24.8) | 3 | * | * |
| 2007 | 15 | 17.6 | (8.7-26.5) | 7 | 8.4 | (2.1-14.7) |
| 2008 | 28 | 32.6 | (20.5-44.7) | 2 | * | * |
| 2009 | 17 | 20.0 | (10.5-29.5) | 5 | 6.1 | (0.8-11.4) |
| 2010 | 15 | 20.8 | (10.3-31.3) | 3 | * | * |
| 2011 | 11 | 16.1 | (6.6-25.6) | 3 | 4.2 | (-0.5-8.9) |
| 2012 | 10 | 14.7 | (5.6-23.8) | 1 | 1.4 | (-1.3-4.1) |
| 2013 | 6 | 8.8 | (1.8-15.8) | 6 | 8.4 | (1.7-15.1) |

Gonorrhea Among Teens (15-19 Years) by Sex and Race/Ethnicity, Kalamazoo County 1994 - 2013 (continued)

| Year | Black, non-Hispanic females | | | Black, non-Hispanic males | | |
|------|-----------------------------|-----------------|-----------------|---------------------------|-----------------|---------------|
| | Cases | Rate per 10,000 | 95% CI | Cases | Rate per 10,000 | 95% CI |
| 1994 | 42 | 400.4 | (281.8-519.0) | 37 | 361.3 | (247.0-475.6) |
| 1995 | 50 | 462.5 | (337.3-587.7) | 32 | 301.0 | (198.3-403.7) |
| 1996 | 51 | 461.1 | (337.5-584.7) | 25 | 230.2 | (141.0-319.4) |
| 1997 | 43 | 381.9 | (270.0-493.8) | 27 | 243.9 | (153.0-334.8) |
| 1998 | 35 | 302.2 | (203.6-400.8) | 26 | 230.5 | (142.9-318.1) |
| 1999 | 65 | 554.1 | (423.2-685.0) | 32 | 279.0 | (183.7-374.3) |
| 2000 | 42 | 353.5 | (248.5-458.5) | 31 | 264.3 | (172.5-356.1) |
| 2001 | 62 | 516.7 | (391.5-641.9) | 21 | 168.5 | (97.0-240.0) |
| 2002 | 48 | 398.7 | (288.2-509.2) | 28 | 218.2 | (138.3-298.1) |
| 2003 | 72 | 584.9 | (453.8-716.0) | 34 | 260.7 | (174.2-347.2) |
| 2004 | 96 | 808.1 | (653.1-963.1) | 29 | 221.9 | (142.0-301.8) |
| 2005 | 53 | 456.5 | (336.4-576.6) | 49 | 362.7 | (263.0-462.4) |
| 2006 | 80 | 674.0 | (531.4-816.6) | 31 | 229.5 | (149.7-309.3) |
| 2007 | 84 | 688.5 | (546.4-830.6) | 39 | 288.7 | (199.4-378.0) |
| 2008 | 147 | 1142.2 | (968.4-1,316.0) | 73 | 517.7 | (402.0-633.4) |
| 2009 | 99 | 755.1 | (612.1-898.1) | 64 | 452.3 | (344.0-560.6) |
| 2010 | 75 | 480.2 | (374.2-586.2) | 58 | 360.5 | (269.4-451.6) |
| 2011 | 73 | 481.2 | (373.5-588.9) | 33 | 209.9 | (139.0-280.8) |
| 2012 | 28 | 184.5 | (116.8-252.2) | 18 | 116.0 | (62.7-169.3) |
| 2013 | 24 | 158.1 | (95.3-220.9) | 19 | 122.4 | (67.7-177.1) |

*Rate not shown, confidence interval exceeds possible limits.

Source: Michigan Department of Community Health, Division of HIV/AIDS-STD, Sexually Transmitted Disease Section, Michigan Sexually Transmitted Diseases Database, 1994 – 2004 data; Michigan Disease Surveillance System, 2005 – 2013 data (provisional 2013 data as of 4/8/2014).

6.3.5 Understanding STI statistics

Cases are required to be reported by law to the health department; however, only cases with a positive test result are reported. Cases who are treated but not tested or cases who are asymptomatic and never identified through screening or contact investigations never end up being reported to the health department and counted as cases. This issue needs to be considered when interpreting chlamydia and gonorrhea rates among subpopulations as well as trends over time. Differential testing based on where a patient presents for care, whether the patient is a male or female, and whether the person is symptomatic or not result in different likelihoods of a person being tested for an STI and thus reported as a case. Although these factors do not account for all of the disparities in rates observed by race, sex and age, they are likely contributors to the magnitude of observed disparities and should be considered.

A likely contributing reason for the disparity in male and female rates is an artifact of testing. More women interface with clinics and providers regularly to have testing done. A HEDIS measure in healthcare for chlamydia screening, as described earlier in this report, is one example of how case identification can be biased towards finding female cases. Private providers are encouraged to screen females annually for chlamydia, but not males.

Another opportunity when more females than males may be diagnosed with chlamydia or gonorrhea is when they seek treatment for symptoms. Symptomatic males with discharge presenting at private providers, urgent care or emergency rooms are likely to be treated and not tested since there are a limited number of possible reasons for discharge, whereas females who typically have asymptomatic infections and present with symptoms similar to PID may have STI testing done to rule out causes.

After a positive test result is reported to the health department, case interviews are done to elicit partner contact information for notification and testing of further infected or exposed partners. It is speculated that males typically have a larger number of partners than females, contributing to a greater number of female cases found than males through contact investigations.

Where a person seeks care effects whether they will be tested or not. Individuals who are insured and have better access to healthcare are more likely to see a private healthcare provider and may be treated presumptively without being tested (and thus not be reported as cases); in contrast, people presenting at the health department clinic are typically uninsured or have Medicaid and are always tested along with treatment. It is speculated that this may be a factor contributing to our observed disparities by race. It certainly does not account for all of the disparity in rates but may make it appear larger than it would be if everyone were tested.

Differential testing based on where a patient presents for care, whether the patient is male or female, and whether the person is symptomatic or not result in different likelihoods of a person being tested for an STI and thus reported as a case. Although these factors do not account for all of the disparities in rates observed by race, sex and age, they are possible contributors and should be kept in mind.

Another important point about STI case detection is that better case finding means more cases. The elevated rates in Kalamazoo County relative to other counties in Michigan are concerning and reflect the great need for vigilant case finding and treatment. However they also indicate success in our case investigations. When a partner of a case is identified and treated, they then are a new case themselves and the investigation process begins again to identify their partners who are at risk. Identifying partners who may be asymptomatic and so likely would not present for care will reduce preventable morbidity in the population and work towards reducing the reservoir of disease in our community.

6.3.6 Risk Behaviors: Adults 18 Years and Older

Statistics presented in this section are from the Kalamazoo County Behavioral Risk Factor Survey (a random telephone survey of adults aged 18 years and older in Kalamazoo County). Adult sexual risk behavior questions were most recently asked in the 2004 survey.

In Kalamazoo County in 2004, 5.6% of adults between the ages of 18 and 49 years had a sexually transmitted infection (STI) at least once in the previous five years. The proportion of adults who had a history of an STI was highest among younger age groups, males, African Americans, and adults with less education or lower incomes. The majority of adults (72.0%) who had an STI in the previous five years had been treated at the Kalamazoo County Health and Community Services Department STD clinic.

**History of Sexually Transmitted Infection(s)
Among Adults Aged 18-49 Years in Kalamazoo County, 2004**

| Demographic Characteristics | Were treated for an STD in the past 5 years | |
|-----------------------------|---------------------------------------------|--------------|
| | % | 95% C.I. |
| Total | 5.6 | (2.8 - 8.4) |
| Age | | |
| 18-24 years | 9.4 | (0.9 - 17.9) |
| 25-29 years | 9.2 | * |
| 30-34 years | 5.6 | * |
| 35-39 years | 4.4 | (0.0 - 8.8) |
| 40-44 years | 3.6 | * |
| 45-49 years | 1.2 | * |
| Gender | | |
| Male | 7.0 | (2.2 - 11.9) |
| Female | 4.1 | (1.5 - 6.7) |
| Race | | |
| White | 3.4 | (1.2 - 5.5) |
| African American | 19.7 | (5.9 - 33.6) |
| Education | | |
| Less than HS | 21.1 | (4.6 - 37.7) |
| HS graduate | 7.4 | (0.9 - 14.0) |
| Some college | 2.3 | (0.2 - 4.4) |
| College graduate | 2.0 | (0.1 - 4.0) |
| Income | | |
| Less than \$35,000 | 8.5 | (2.6 - 14.4) |
| \$35,000+ | 3.3 | (0.6 - 6.0) |

*Confidence interval exceeds possible limits

Source: Kalamazoo County 2004 Behavioral Risk Factor Survey

The surest way to avoid transmission of STIs is to abstain from sexual contact or to be in a long-term mutually monogamous relationship with a partner who has been tested and is known to be uninfected. If a person is not in a long-term monogamous relationship and chooses to have sex, limiting the number of partners may reduce risk of acquiring some sexually transmitted infections.⁷

Among Kalamazoo County adults less than 50 years of age, 10.6% had more than one sex partner in the past twelve months. The proportion of adults with more than one sex partner in the past year was highest among younger age groups; 21.6% of adults aged 18 to 24 years had more than one sex partner in this time period, compared with 2.3% of adults aged 45 to 49 years. Males were more likely to have had more than one sex partner than females in the previous year (16.1% compared with 4.9%, respectively), and adults with less education or lower income were also more likely to have had more than one sex partner in the past year than adults with more education or higher income.

**Number of Sex Partners in Past 12 Months Among Adults
Aged 18-49 Years in Kalamazoo County, 2004**

| Demographic Characteristics | Zero | | One | | 2 or more | |
|-----------------------------|------|---------------|------|---------------|-----------|---------------|
| | % | 95% C.I. | % | 95% C.I. | % | 95% C.I. |
| Total | 12.2 | (8.5 - 15.8) | 77.2 | (72.5 - 82.0) | 10.6 | (7.0 - 14.3) |
| Age | | | | | | |
| 18-24 years | 20.2 | (10.0 - 30.5) | 58.1 | (45.3 - 71.0) | 21.6 | (10.6 - 32.6) |
| 25-29 years | 17.1 | (2.7 - 31.6) | 62.2 | (46.3 - 78.1) | 20.7 | (7.8 - 33.5) |
| 30-34 years | 3.8 | (0.0 - 7.6) | 89.4 | (82.6 - 96.1) | 6.9 | (1.2 - 12.5) |
| 35-39 years | 8.6 | (3.0 - 14.2) | 87.3 | (79.5 - 95.2) | 4.1 | * |
| 40-44 years | 6.2 | (2.0 - 10.3) | 88.9 | (81.8 - 95.9) | 5.0 | * |
| 45-49 years | 12.4 | (5.0 - 19.8) | 85.3 | (77.6 - 93.1) | 2.3 | * |
| Gender | | | | | | |
| Male | 12.6 | (6.8 - 18.3) | 71.4 | (63.7 - 79.0) | 16.1 | (9.8 - 22.4) |
| Female | 11.7 | (7.5 - 15.9) | 83.3 | (78.2 - 88.4) | 4.9 | (1.6 - 8.2) |
| Race | | | | | | |
| White | 10.9 | (7.2 - 14.6) | 79.1 | (74.0 - 84.2) | 10.0 | (6.0 - 14.0) |
| African American | 12.2 | (1.1 - 23.3) | 73.4 | (59.4 - 87.3) | 14.4 | (4.0 - 24.7) |
| Education | | | | | | |
| Less than HS | 8.6 | (0.1 - 17.2) | 69.6 | (53.0 - 86.1) | 21.8 | (6.2 - 37.4) |
| HS graduate | 14.1 | (5.4 - 22.8) | 74.5 | (63.9 - 85.1) | 11.4 | (3.5 - 19.3) |
| Some college | 16.5 | (9.4 - 23.7) | 75.3 | (66.9 - 83.8) | 8.2 | (2.6 - 13.7) |
| College graduate | 6.6 | (3.3 - 9.8) | 84.9 | (79.2 - 90.6) | 8.5 | (3.5 - 13.5) |
| Income | | | | | | |
| Less than \$35,000 | 16.6 | (10.2 - 22.9) | 68.5 | (60.0 - 76.9) | 15.0 | (8.0 - 21.9) |
| \$35,000+ | 9.1 | (4.3 - 13.9) | 86.6 | (81.2 - 91.9) | 4.4 | (1.6 - 7.1) |

*Confidence interval exceeds possible limits

Source: Kalamazoo County 2004 Behavioral Risk Factor Survey

⁷ Centers for Disease Control and Prevention (<http://www.cdc.gov/std/default.htm>)

Latex male condoms reduce risk for some STIs, including chlamydia, gonorrhea, and trichomoniasis. Risk for other STIs may or may not be reduced by condom use; risk of transmission of syphilis and herpes is only reduced with condom use if the condom covers the infected area or site of potential exposure. Condom use has not been found to reduce risk for bacterial vaginosis or HPV transmission.⁸

Among Kalamazoo County adults aged 18 to 49 years, 74.4% did not use a condom the most recent time they had sexual intercourse. Condom use at last intercourse was highest among younger age groups and among lower income levels.

Condom Use Among Adults Aged 18-49 Years in Kalamazoo County, 2004

| Demographic Characteristics | Did not use a condom at last sexual intercourse | |
|-----------------------------|-------------------------------------------------|---------------|
| | % | 95% C.I. |
| Total | 74.4 | (69.2 - 79.6) |
| Age | | |
| 18-24 years | 37.8 | (24.1 - 51.4) |
| 25-29 years | 76.8 | (64.0 - 89.5) |
| 30-34 years | 84.5 | (75.7 - 93.3) |
| 35-39 years | 81.9 | (71.5 - 92.4) |
| 40-44 years | 82.5 | (72.9 - 92.1) |
| 45-49 years | 95.2 | (91.6 - 98.9) |
| Gender | | |
| Male | 70.8 | (62.6 - 78.9) |
| Female | 78.3 | (72.0 - 84.5) |
| Race | | |
| White | 75.8 | (70.1 - 81.5) |
| African American | 73.1 | (59.2 - 87.0) |
| Education | | |
| Less than HS | 76.8 | (61.1 - 92.5) |
| HS graduate | 72.7 | (60.9 - 84.5) |
| Some college | 73.1 | (63.4 - 82.8) |
| College graduate | 76.2 | (68.8 - 83.6) |
| Income | | |
| Less than \$35,000 | 65.5 | (55.8 - 75.1) |
| \$35,000+ | 85.0 | (79.6 - 90.4) |

*Confidence interval exceeds possible limits

Source: Kalamazoo County 2004 Behavioral Risk Factor Survey

⁸ Centers for Disease Control and Prevention (<http://www.cdc.gov/std/default.htm>)

In Kalamazoo County in 2004, the most common reason for having used a condom at most recent intercourse was to prevent both pregnancy and sexually transmitted infections. In total, 52.7% of adults used a condom to prevent sexually transmitted infections, and 88.8% of adults used a condom to prevent pregnancy.

Reason for Condom Use Among Adults Aged 18-49 Years Who Reported Having Used a Condom When They Most Recently Had Sex, Kalamazoo County, 2004

| Reason Used a Condom Last Time Had Sex | % | 95% C.I. |
|----------------------------------------------------|----------|-----------------|
| Prevent pregnancy | 43.3 | (31.4 - 55.3) |
| Prevent diseases like syphilis, gonorrhea and AIDS | 7.0 | (1.3 - 12.8) |
| For both of these reasons | 45.7 | (33.4 - 57.9) |
| Some other reason | 4.0 | (0.4 - 7.5) |

Source: Kalamazoo County 2004 Behavioral Risk Factor Survey

6.3.7 Risk Behaviors: Youth

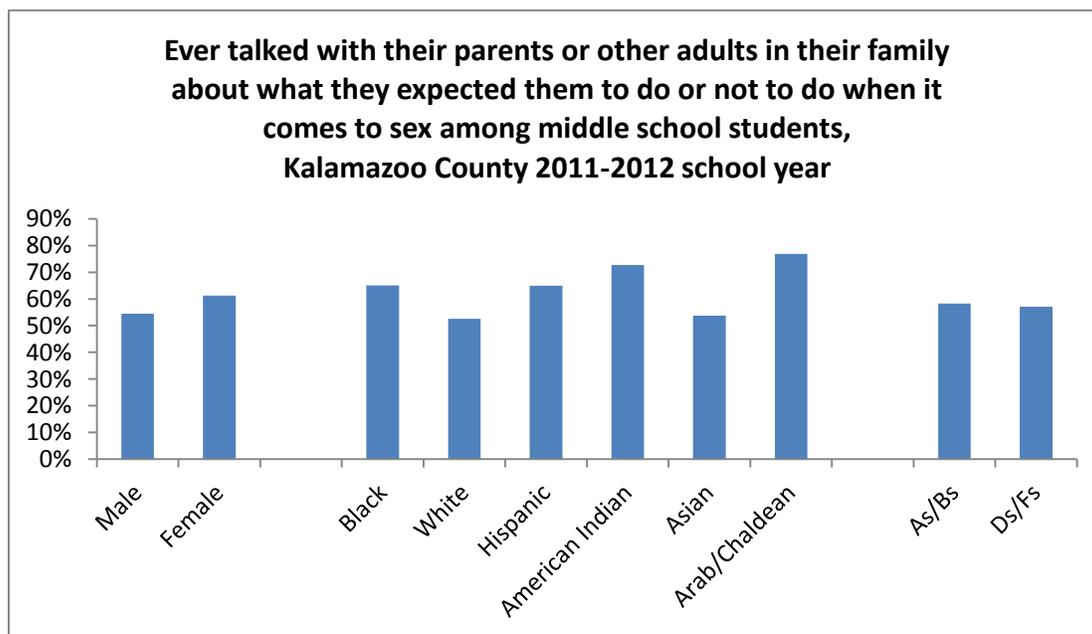
Middle school and high schools in Kalamazoo County participated in a Michigan Department of Education Survey during the 2011-2012 school year called the Michigan Profile for Healthy Youth (MIPHY) survey.⁹ This is an online survey conducted in grades 7, 9, and 11 every other year, and collects information on health risk behaviors including substance use, violence, physical activity, nutrition, sexual behavior, and emotional health. The survey also measures risk and protective factors most predictive of alcohol, tobacco, and other drug use and violence.

This section of the STI report summarizes MIPHY results for Kalamazoo County in the area of sexual behavior. Results are presented for demographic subgroups: sex, race and ethnicity, and academics (students who receive mostly As and Bs compared with students who receive mostly Ds and Fs). Although American Indian, Arab/Chaldean, and Asian student results are included in tables, these populations were relatively small compared with other race and ethnicity groups and so results are less reliable than for larger subpopulations.

Data for Kalamazoo County students is available over two school year survey cycles (2009-2010 school year and 2011-2012 school year).

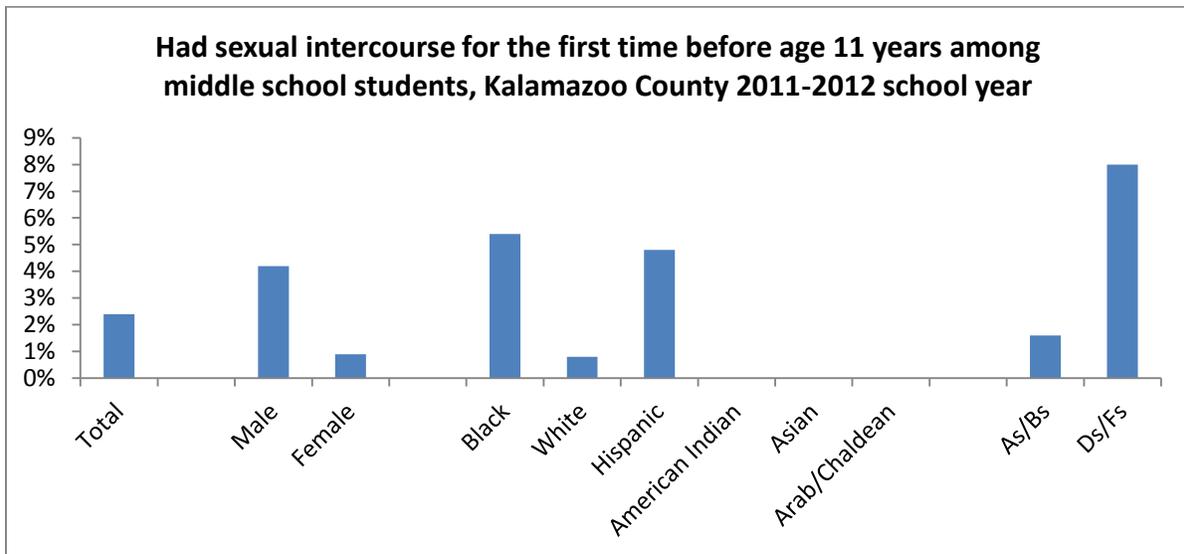
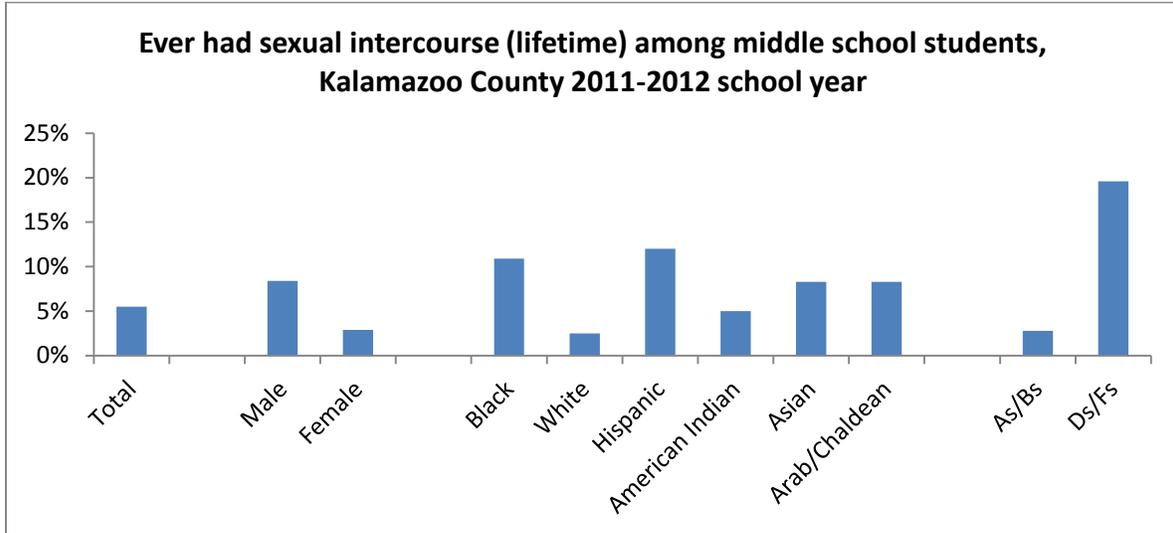
Middle School Student Behaviors

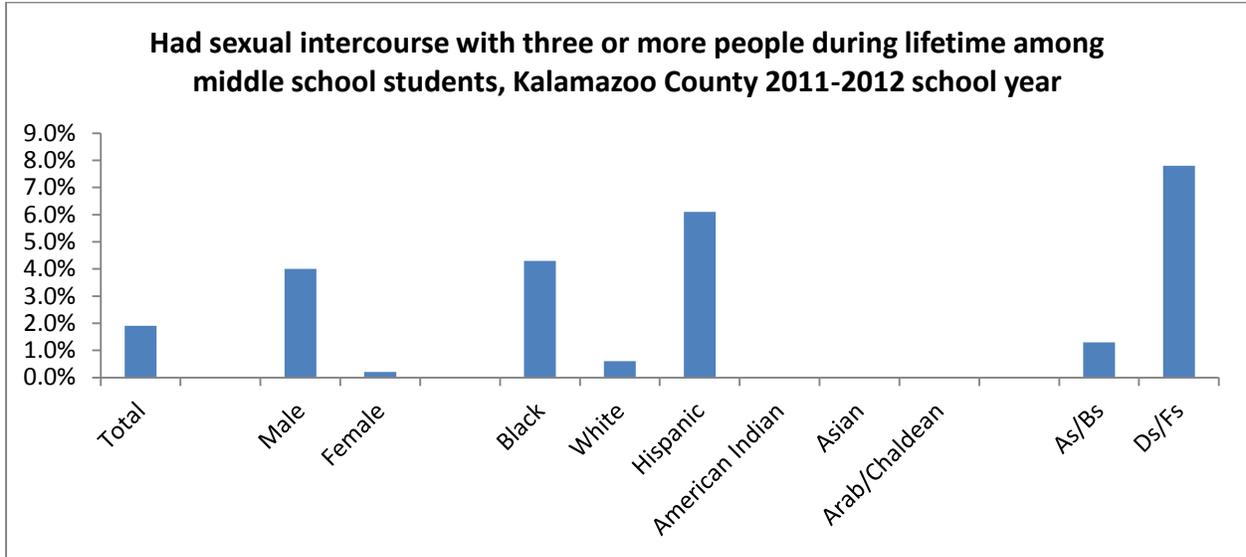
Among seventh graders in Kalamazoo County, 58.3% had ever talked with their parents or other adults in their family about what they expected them to do or not to do when it comes to sex. A greater proportion of girls had talked about this than boys, and more black students than white students reported they had talked about expectations with an adult in their family. What the expectations were, however, were not specified.



⁹ Results are publicly available for the county overall (not by individual districts or schools) here: <https://mdoe.state.mi.us/MIPHYADMIN/reports/CountyReport.aspx>.

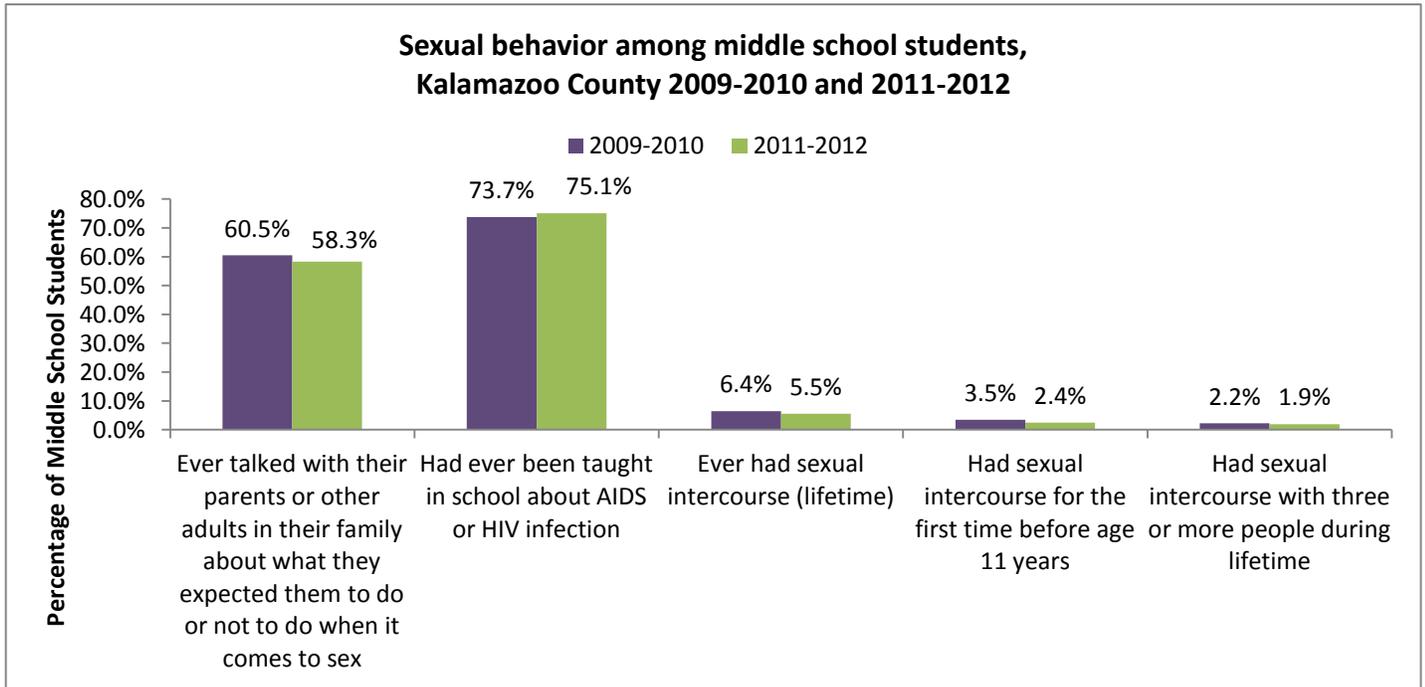
In total, 5.5% of seventh graders reported they had ever had sexual intercourse, 2.4% reported they had sex for the first time before age 11, and 1.9% reported they had had sexual intercourse with three or more people during their life. Black students and Hispanic students (compared to white students), boys, and students with mostly Ds and Fs for grades (compared with students with As and Bs) were more likely to have ever had sexual intercourse, were more likely to have had sex before age 11, and were more likely to have had sexual intercourse with three or more people in their life.

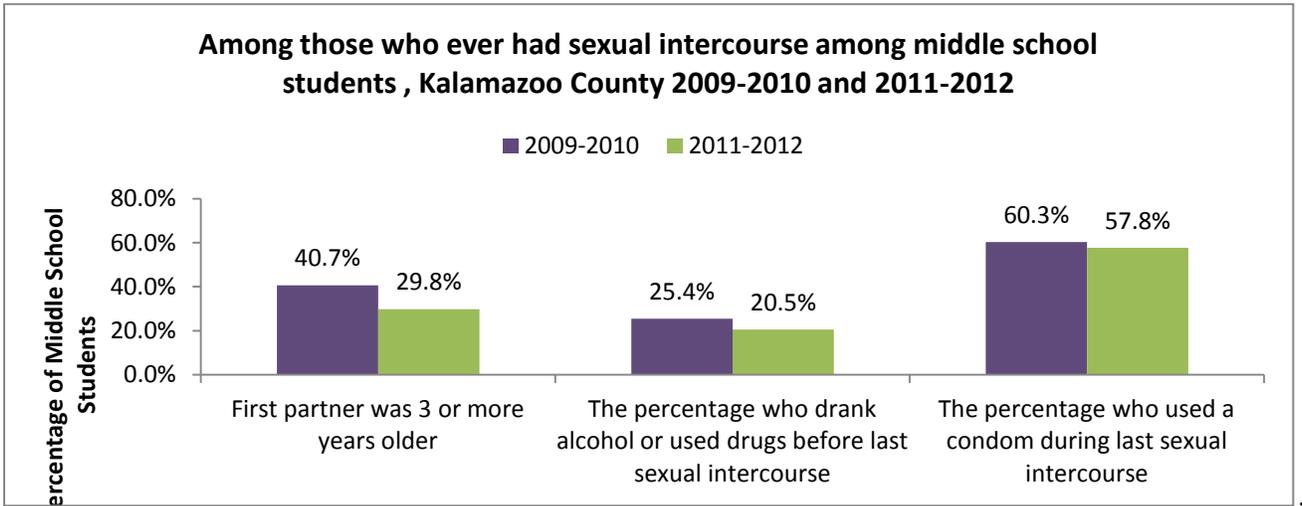




Among students who had ever had sexual intercourse, almost a third (29.8%) reported their first partner was three or more years older. One fifth (20.5%) reported they drank alcohol or used drugs before last sexual intercourse, and 57.8% reported they had used a condom the last time they had sex.

Between the 2009-2010 and 2011-2012 school years, the percentage of middle school students reporting most behaviors or sexual history was similar. One indicator that did differ over time was among those who ever had sexual intercourse, the percentage whose partner was three or more years older (lower by 11% in 2011-2012 compared with 2009-2010).





Sexual Behavior, Kalamazoo County 7th Graders, 2011-2012 School Year

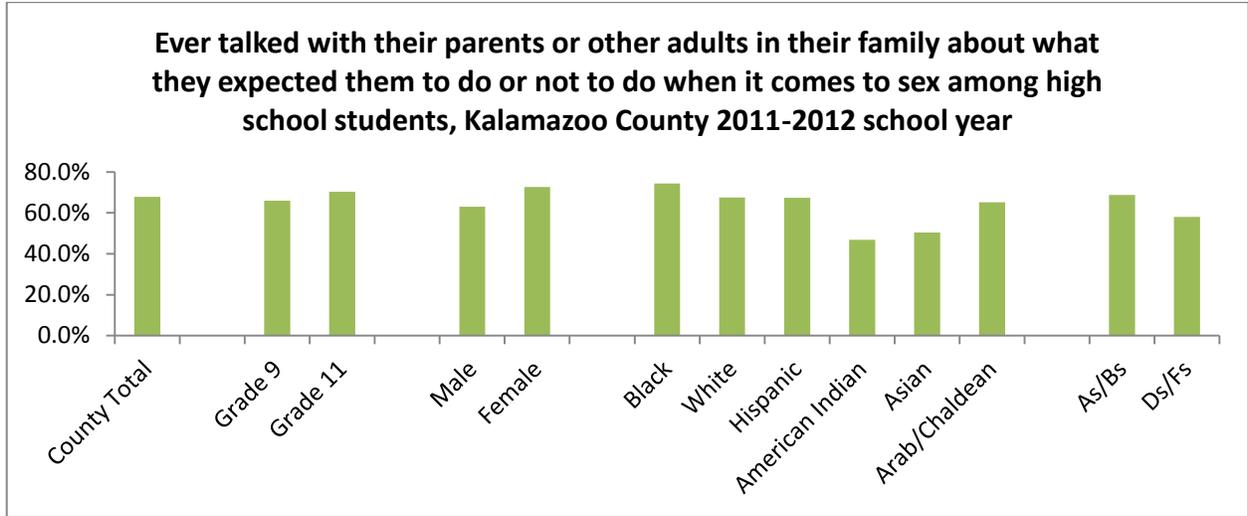
| Indicator | Gender | | | Race/Ethnicity | | | | | | Academics | |
|--------------------------------------------------------------------------------------------------------------------------------------|--------|-------|--------|----------------|-------|----------|-----------------|-------|---------------|-----------|-------|
| | Total | Male | Female | Black | White | Hispanic | American Indian | Asian | Arab/Chaldean | As/Bs | Ds/Fs |
| Ever talked with their parents or other adults in their family about what they expected them to do or not to do when it comes to sex | 58.3% | 54.4% | 61.3% | 65.1% | 52.6% | 64.9% | 72.7% | 53.8% | 76.9% | 58.3% | 57.1% |
| Had ever been taught in school about AIDS or HIV infection | 75.1% | 76.1% | 74.2% | 67.5% | 80.5% | 64.9% | 81.8% | 53.8% | 76.9% | 79.5% | 67.9% |
| Ever had sexual intercourse (lifetime) | 5.5% | 8.4% | 2.9% | 10.9% | 2.5% | 12.0% | 5.0% | 8.3% | 8.3% | 2.8% | 19.6% |
| Had sexual intercourse for the first time before age 11 years | 2.4% | 4.2% | 0.9% | 5.4% | 0.8% | 4.8% | 0.0% | 0.0% | 0.0% | 1.6% | 8.0% |
| Had sexual intercourse with three or more people during lifetime | 1.9% | 4.0% | 0.2% | 4.3% | 0.6% | 6.1% | 0.0% | 0.0% | 0.0% | 1.3% | 7.8% |
| Among those who ever had sexual intercourse, first partner was 3 or more years older | 29.8% | 21.9% | 50.0% | 27.8% | 33.3% | 30.0% | * | * | * | 33.3% | 30.0% |
| Among those who ever had sexual intercourse, the percentage who drank alcohol or used drugs before last sexual intercourse | 20.5% | 16.7% | 30.8% | 11.8% | 20.0% | 30.0% | * | * | * | 27.8% | 30.0% |
| Among those who ever had sexual intercourse, the percentage who used a condom during last sexual intercourse | 57.8% | 63.3% | 50.0% | 55.6% | 36.4% | * | * | * | * | 66.7% | 40.0% |

Source: Michigan Department of Education, Michigan Profile for Healthy Youth; accessed 7.31.12 at <https://mdoe.state.mi.us/MIPHYADMIN/reports/CountyReport.aspx>.

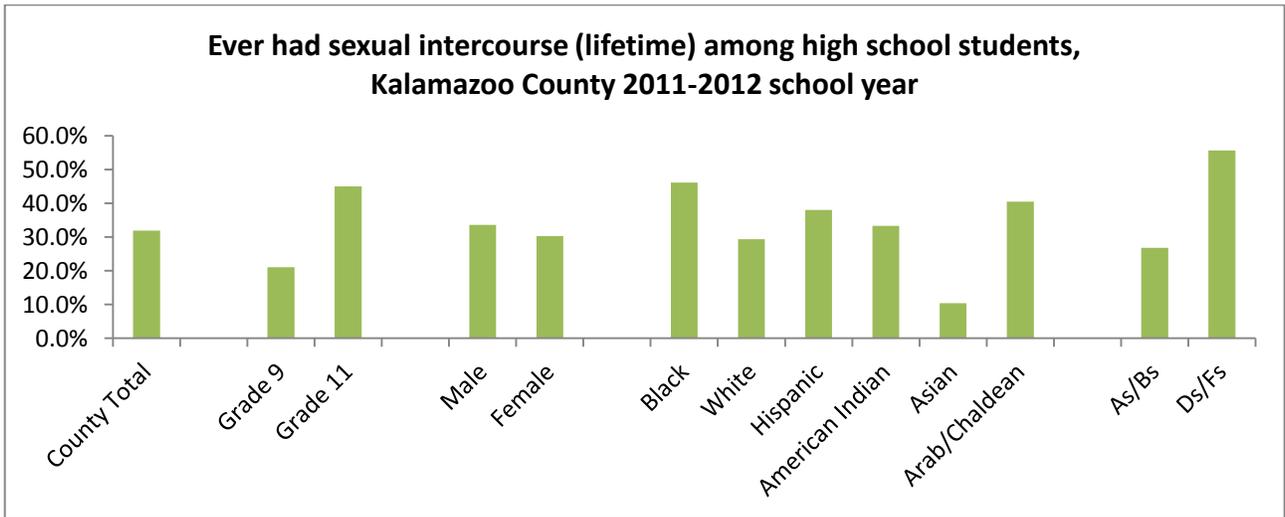
*Data suppressed due to fewer than 10 valid student surveys

High School Student Behaviors

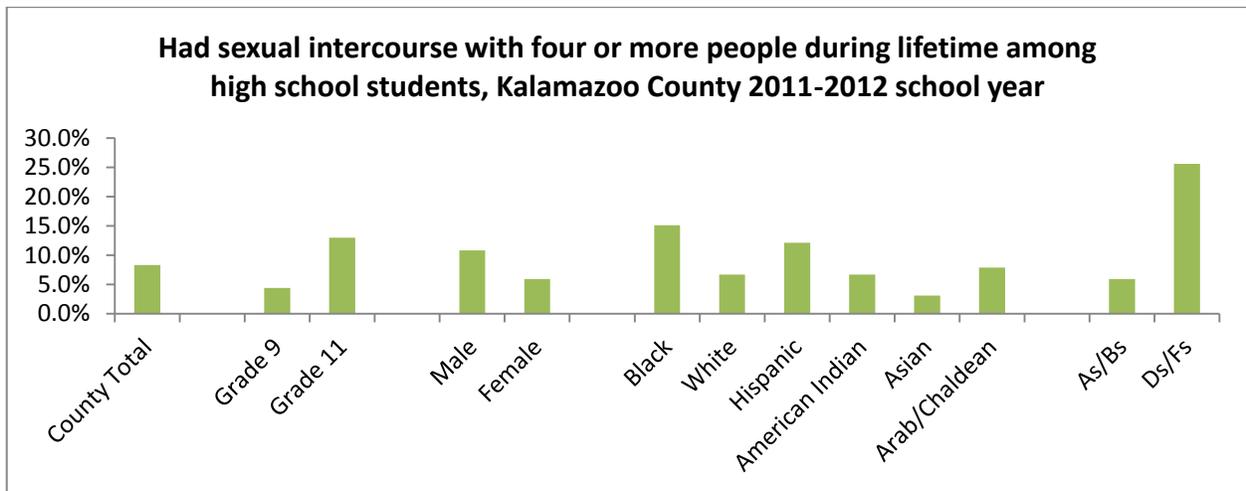
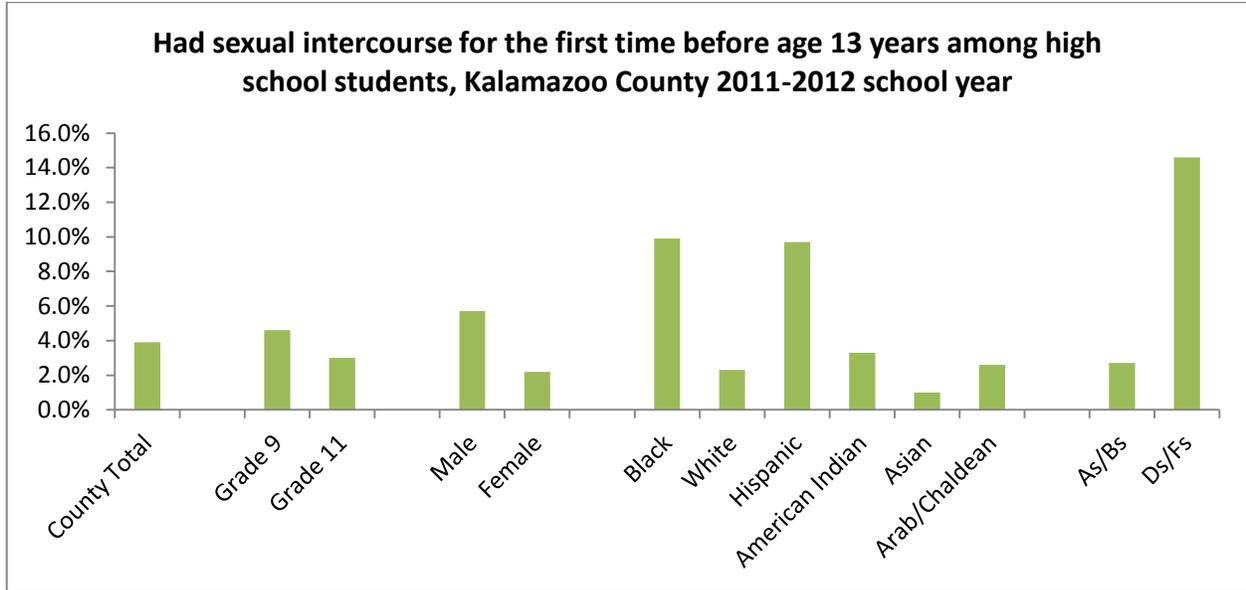
Among ninth and eleventh graders in Kalamazoo County, 67.9% reported that they had ever talked with their parents or other adults in their family about what they expected them to do or not to do when it comes to sex. This rate was slightly higher among girls than boys, higher among black students than white students, and higher among students earning mostly As/Bs.



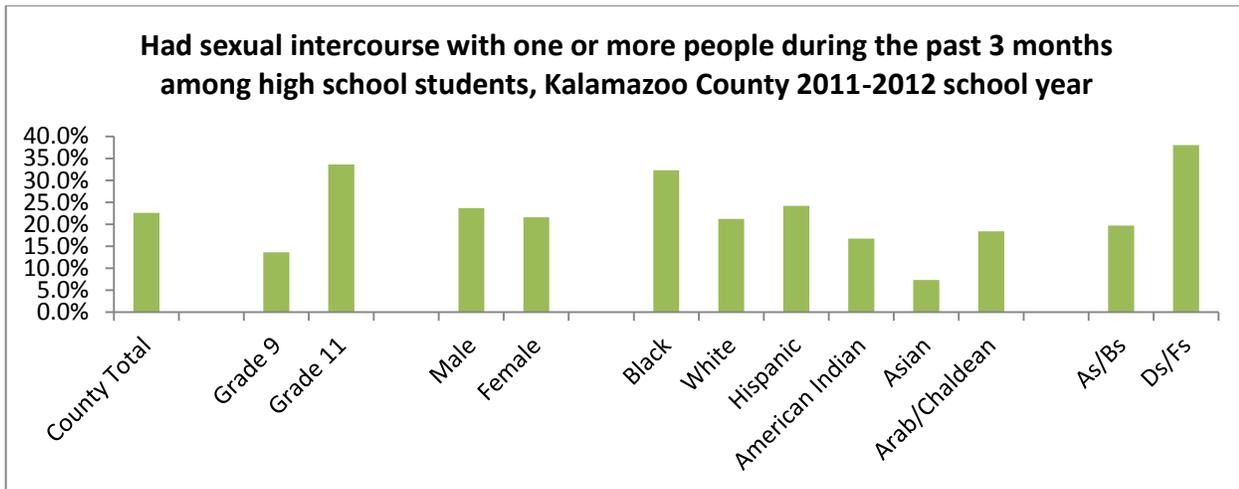
Almost one third (31.9%) of students had ever had sexual intercourse; the proportion reporting they'd had sex was higher among males, black students and Hispanic students (compared with white students), and students with mostly Ds and Fs for grades (compared with students who received mostly As and Bs).



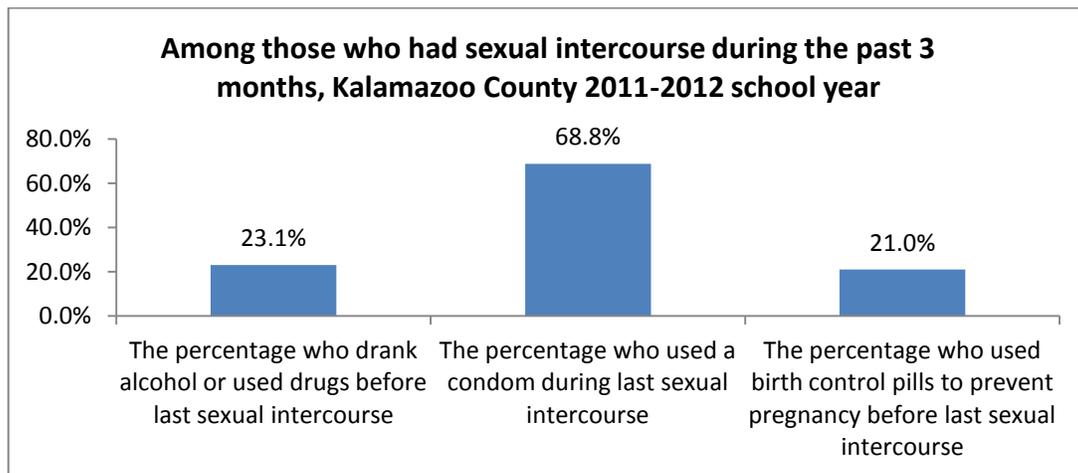
Early onset of sexual activity (sexual intercourse before the age of 13 years) was reported by 3.9% of high school students. This was reported more by 9th graders than 11th graders, males, black students, Hispanic students, and students with poorer grades. Having had four or more sexual partners in their lifetime was reported more by 11th graders, males, black students, Hispanic students, and students with poorer grades. Among all high school students surveyed, 8.3% of students said they had had four or more sexual partners.



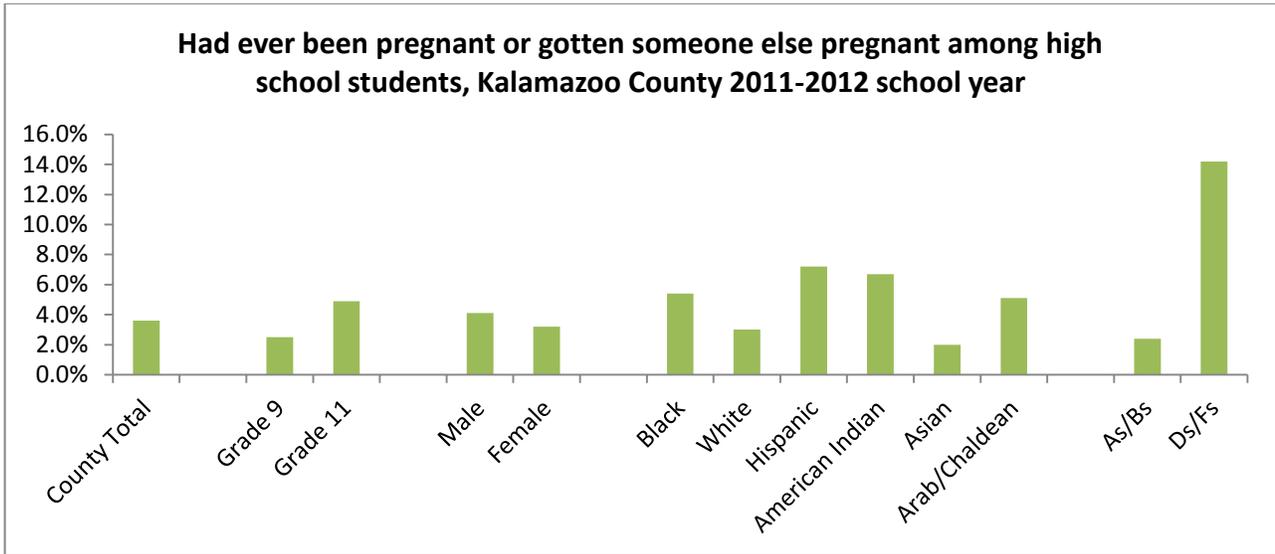
One out of five (22.6%) high school students reported that they had sexual intercourse with one or more people recently (during the past three months). This proportion was higher among 11th graders, black students, and students with poor academic grades.



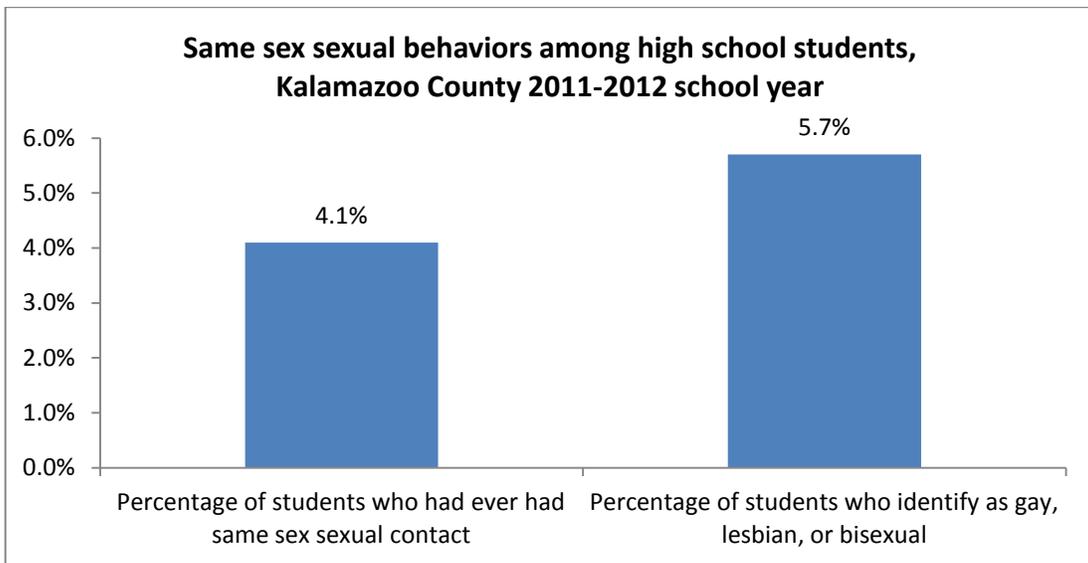
Among students who had sexual intercourse during the past three months, almost one quarter (23.1%) reported they used alcohol or drugs prior to the last time they had sex, two out of three (68.8%) reported they used a condom last time they had sex, and one in five (21.0%) said before the most recent time they had sex they had used birth control pills to prevent pregnancy.



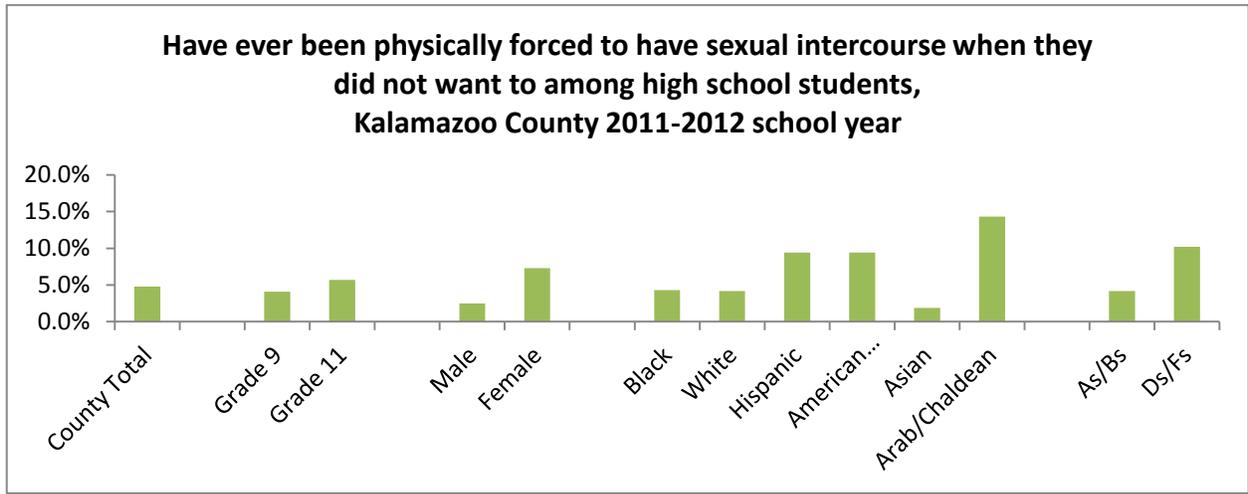
A total of 3.6% of 9th and 11th graders reported they had ever been pregnant or had gotten someone else pregnant. This percentage was highest for 11th graders, Hispanic students, and students with poor academic grades.



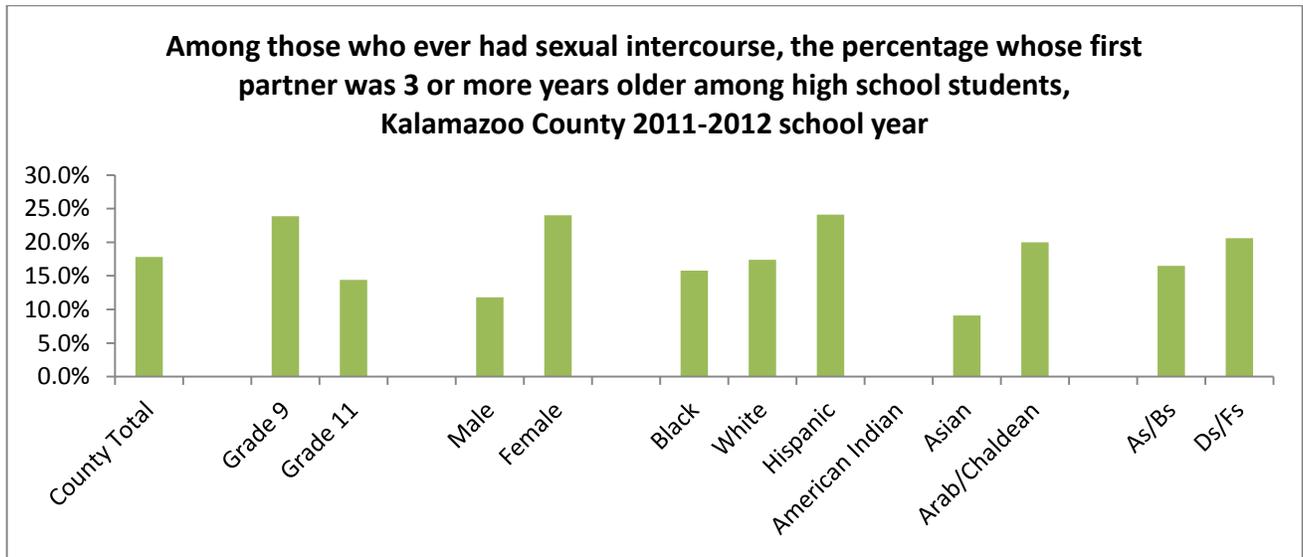
Four percent (4.1%) of high school students had had same sex sexual contact in their lifetime, and 5.7% of high school students identified as gay, lesbian, or bisexual in Kalamazoo County during the 2011-2012 school year. Both of these indicators were higher among females than males and among students earning Ds/Fs than students earning As/Bs.



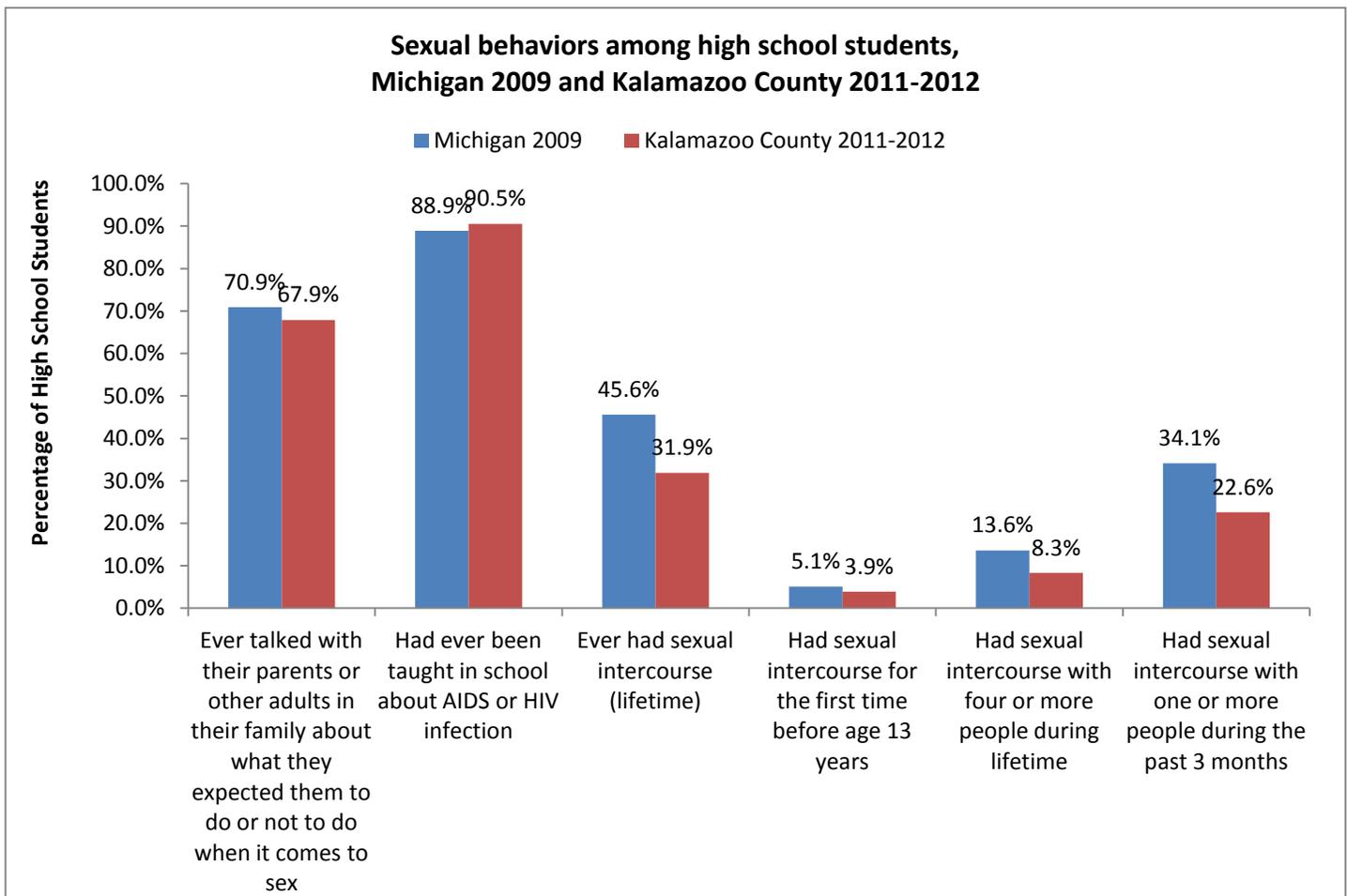
One in twenty Kalamazoo County high school students (4.8%) reported that they had ever been physically forced to have sexual intercourse when they did not want to. This percentage was similar for 9th and 11th graders, and highest among girls, Hispanic, American Indian and Arab students, and students with poor academic grades.



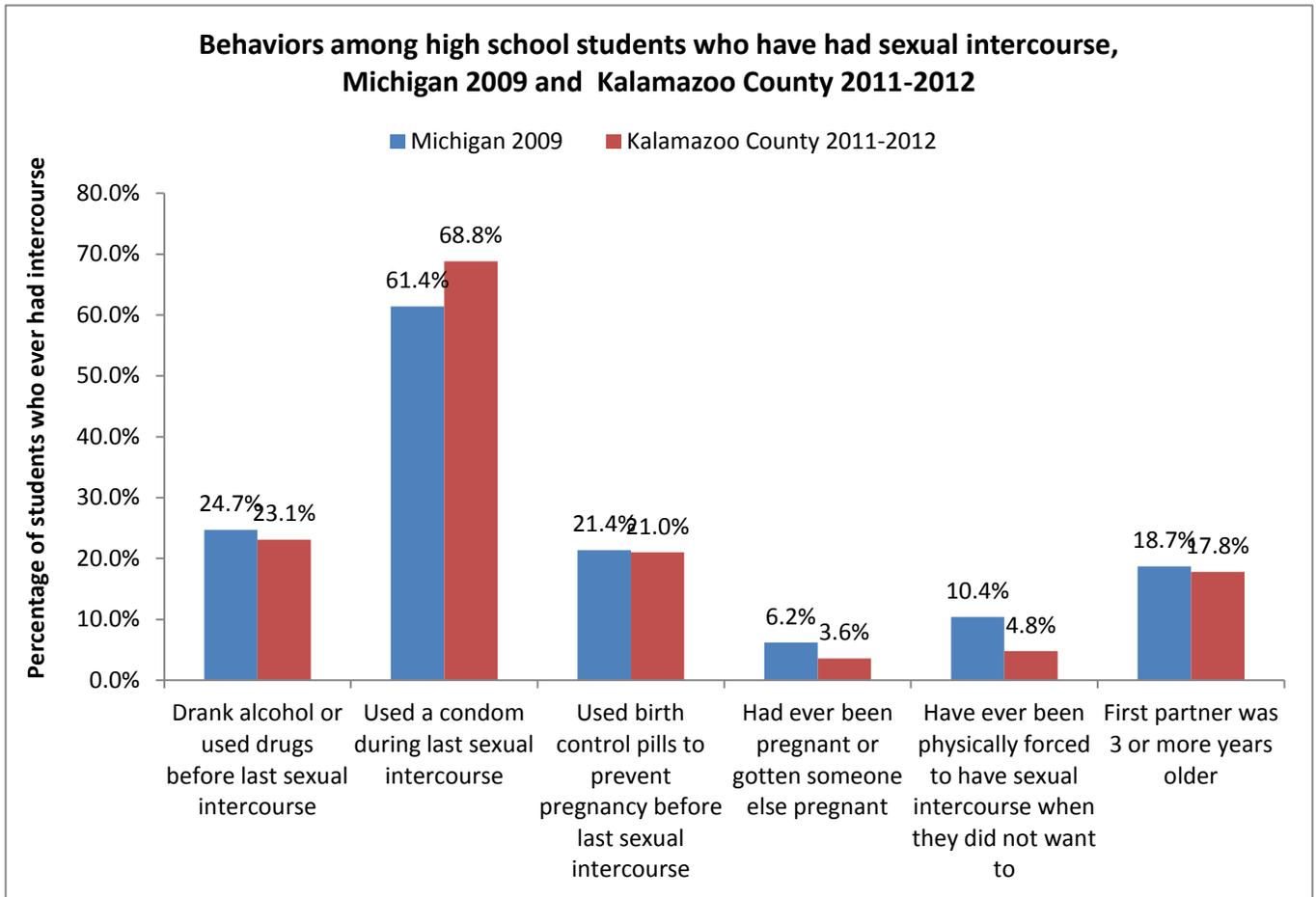
Among all students reporting they had ever had sexual intercourse, 17.8% reported their first partner was three or more years older than they were at the time. This percentage was highest among 9th graders, females, Hispanic students, and students with poor academic grades.



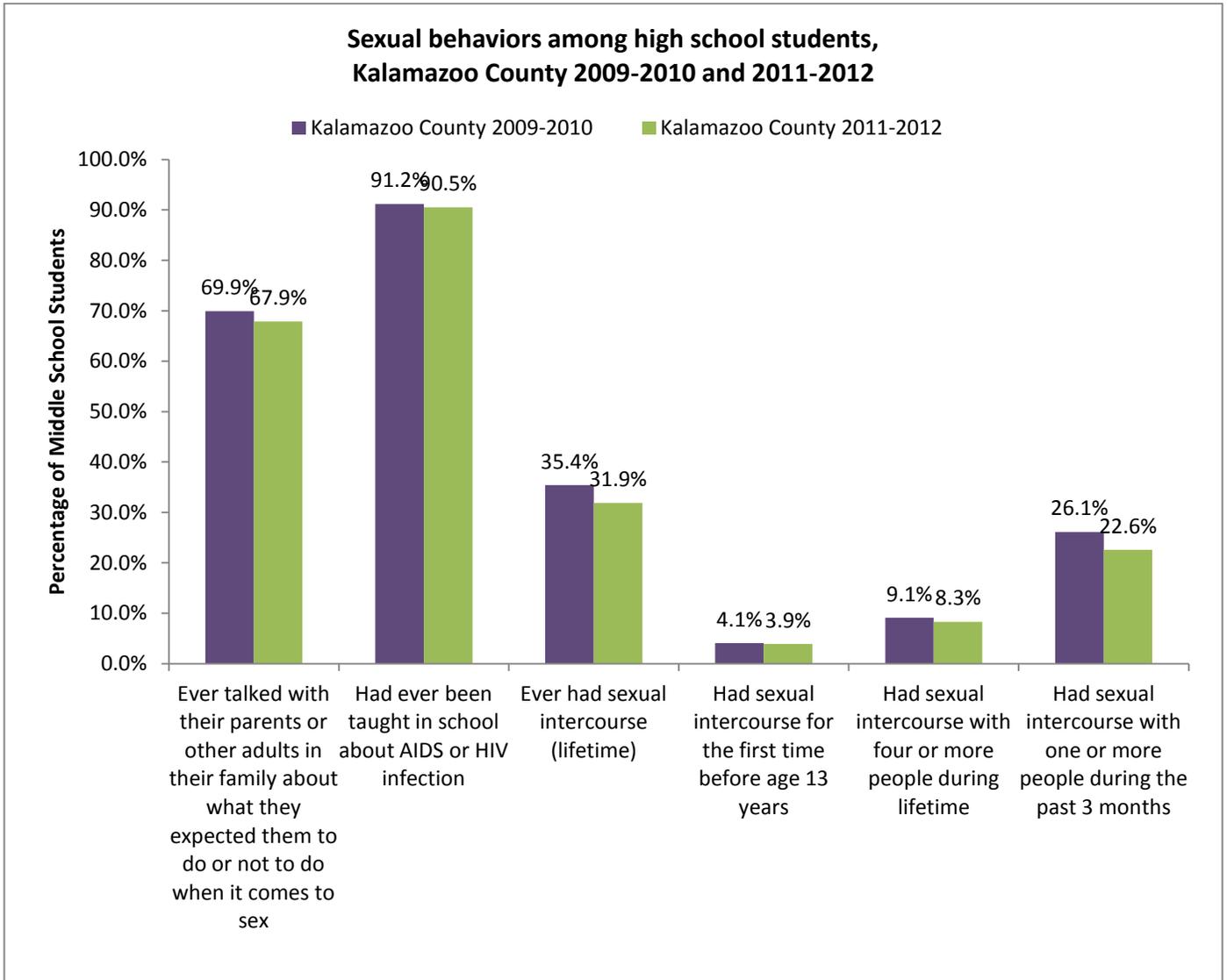
The Michigan Youth Risk Behavior Survey (YRBS) is part of a nationwide surveying effort led by the Centers for Disease Control and Prevention (CDC) to monitor students' health risks and behaviors in six categories identified as most likely to result in adverse outcomes. These categories include unintentional injury and violence, tobacco use, alcohol and other drug use, sexual behaviors that contribute to unintended pregnancy or disease, dietary behaviors, and physical inactivity.¹⁰ The following data was taken from the Michigan high school sexual behaviors category for the 2008-2009 school year. According to this data, the percentage of high school students reporting most behaviors or sexual history was similar between Kalamazoo County and Michigan. However, Michigan had a higher proportion of high school students who had ever had sexual intercourse than Kalamazoo County (45.6% of Michigan high school students and 31.9% of Kalamazoo County high school students reported they every had sexual intercourse).

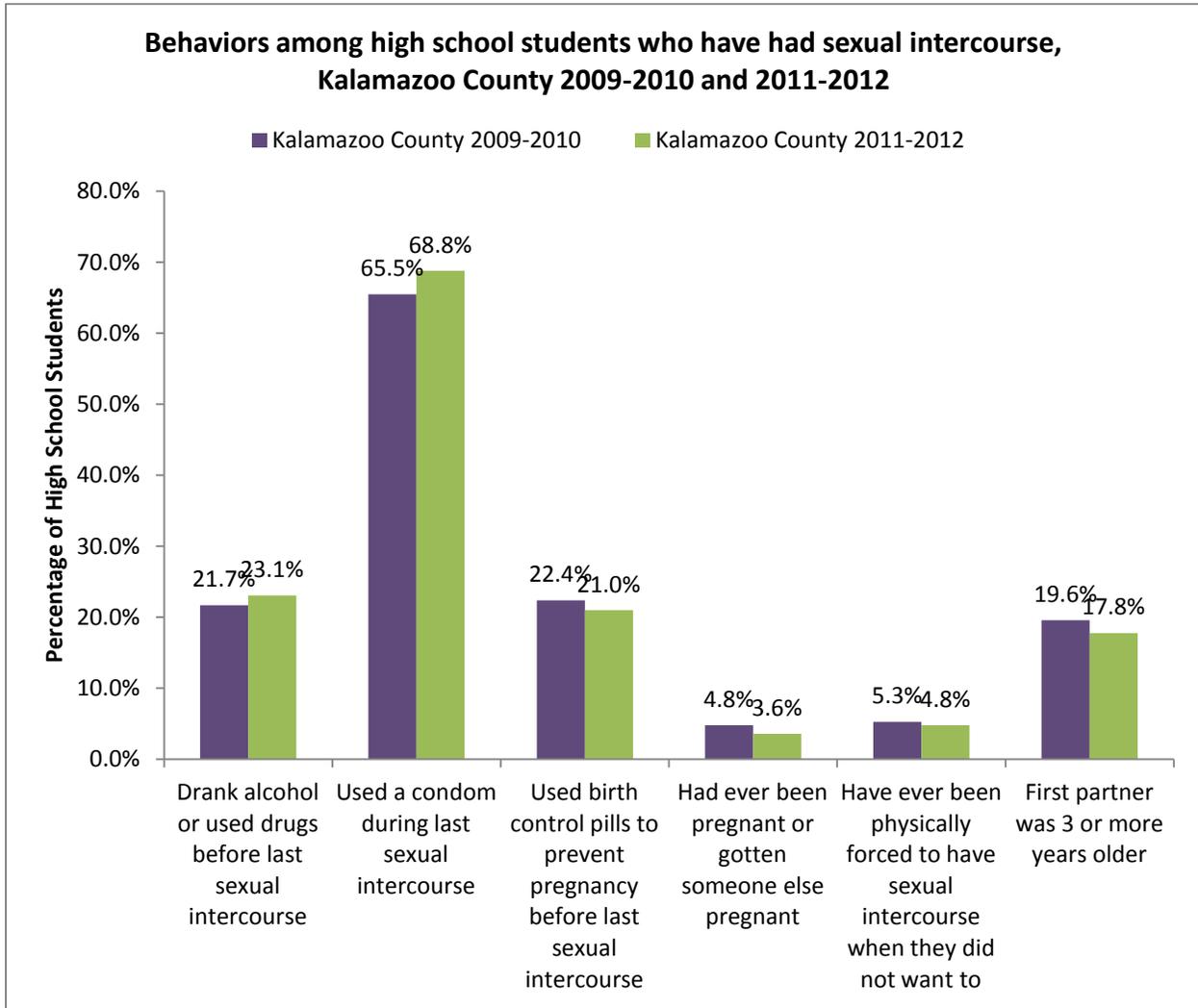


¹⁰ Michigan Youth Risk Behavior Survey, 2011-2012, accessed at <http://www.michigan.gov/yrbs>.



Between the 2009-2010 and 2011-2012 school years, the percentage of high school students reporting most behaviors or sexual history was similar. Two indicators that did show slight differences over time were among high school students, the percentage who ever had sexual intercourse in their lifetime (35.4% in 2009-2010 and 31.9% in 2011-2012) and the percentage who had sexual intercourse with one or more people during the past 3 months (26.1% in 2009-2010 and 22.6% in 2011-2012). Another slight difference was among high school students who have ever had sex, the percentage who used a condom during last sexual intercourse was higher in 2011-2012 (65.5% in 2009-2010 compared with 68.8% in 2011-2012).





Sexual Behavior, Kalamazoo County 9th and 11th Graders, 2011-2012 School Year

| Indicator | MI YRBS ^a | County Total | Grade | | Gender | | Race/Ethnicity | | | | | | Academics | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------|---------|----------|--------|--------|----------------|-------|----------|-----------------|-------|---------------|-----------|-------|
| | | | Grade 9 | Grade 11 | Male | Female | Black | White | Hispanic | American Indian | Asian | Arab/Chaldean | As/Bs | Ds/Fs |
| Ever talked with their parents or other adults in their family about what they expected them to do or not to do when it comes to sex | 70.9% | 67.9% | 65.9% | 70.3% | 63.0% | 72.6% | 74.3% | 67.6% | 67.4% | 46.9% | 50.5% | 65.2% | 68.8% | 58.0% |
| Had ever been taught in school about AIDS or HIV infection | 88.9% | 90.5% | 90.7% | 90.1% | 89.4% | 91.4% | 86.5% | 92.2% | 85.9% | 84.4% | 90.2% | 89.4% | 91.9% | 76.1% |
| Ever had sexual intercourse (lifetime) | 45.6% | 31.9% | 21.0% | 45.0% | 33.6% | 30.3% | 46.1% | 29.3% | 38.0% | 33.3% | 10.4% | 40.5% | 26.8% | 55.6% |
| Had sexual intercourse for the first time before age 13 years | 5.1% | 3.9% | 4.6% | 3.0% | 5.7% | 2.2% | 9.9% | 2.3% | 9.7% | 3.3% | 1.0% | 2.6% | 2.7% | 14.6% |
| Had sexual intercourse with four or more people during lifetime | 13.6% | 8.3% | 4.4% | 13.0% | 10.8% | 5.9% | 15.1% | 6.7% | 12.1% | 6.7% | 3.1% | 7.9% | 5.9% | 25.6% |
| Had sexual intercourse with one or more people during the past 3 months | 34.1% | 22.6% | 13.6% | 33.6% | 23.7% | 21.6% | 32.3% | 21.2% | 24.2% | 16.7% | 7.3% | 18.4% | 19.7% | 38.0% |
| Among those who had sexual intercourse during the past 3 months, the percentage who drank alcohol or used drugs before last sexual intercourse** | 24.7% | 23.1% | 23.2% | 23.1% | 26.1% | 20.2% | 19.8% | 24.6% | 17.0% | * | * | * | 19.6% | 38.6% |
| Among those who had sexual intercourse during the past 3 months, the percentage who used a condom during last sexual intercourse | 61.4% | 68.8% | 70.4% | 68.0% | 74.7% | 62.9% | 71.3% | 69.9% | 63.3% | * | * | * | 71.8% | 56.5% |
| Among those who had sexual intercourse during the past 3 months, the percentage who used birth control pills to prevent pregnancy before last sexual intercourse | 21.4% | 21.0% | 15.9% | 23.5% | 18.9% | 23.2% | 10.8% | 23.1% | 16.0% | * | * | * | 23.2% | 17.4% |
| Had ever been pregnant or gotten someone else pregnant | 6.2% | 3.6% | 2.5% | 4.9% | 4.1% | 3.2% | 5.4% | 3.0% | 7.2% | 6.7% | 2.0% | 5.1% | 2.4% | 14.2% |

| | | | | | | | | | | | | | | |
|-----------------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|-------|-------|-------|
| Have ever been physically forced to have sexual intercourse when they did not want to | 10.4% | 4.8% | 4.1% | 5.7% | 2.5% | 7.3% | 4.3% | 4.2% | 9.4% | 9.4% | 1.9% | 14.3% | 4.2% | 10.2% |
| Among those who ever had sexual intercourse, the percentage whose first partner was 3 or more years older | 18.7% | 17.8% | 23.9% | 14.4% | 11.8% | 24.0% | 15.8% | 17.4% | 24.1% | 0.0% | 9.1% | 20.0% | 16.5% | 20.6% |
| Percentage of students who had ever had same sex sexual contact | N/A | 4.1% | 3.6% | 4.7% | 2.6% | 5.7% | 4.5% | 3.4% | 5.7% | 9.4% | 0.9% | 12.0% | 3.6% | 9.9% |
| Percentage of students who identify as gay, lesbian, or bisexual | N/A | 5.7% | 6.0% | 5.4% | 2.7% | 8.7% | 6.4% | 5.1% | 5.5% | 3.1% | 1.0% | 2.2% | 4.5% | 18.6% |

Source: Michigan Department of Education, Michigan Profile for Healthy Youth; accessed 7.31.12 at <https://mdoe.state.mi.us/MIPHYADMIN/reports/CountyReport.aspx>.

^aMichigan Youth Risk Behavior Survey. For additional information on the YRBS results, please go to www.michigan.gov/yrbs.

*Data suppressed due to fewer than 10 valid student surveys