Chlamydia and Gonorrhea:  
A Silent Epidemic in Muskegon County

There is a silent epidemic that is occurring in Muskegon County. It is hidden and growing in size and severity, and this epidemic will continue to spread unless direct action is taken. In 2015, there were 1,347 chlamydia and 410 gonorrhea cases reported to Public Health-Muskegon County, which makes these sexually transmitted diseases (STDs) the most prevalent kind of infection in Muskegon County. It’s possible to be infected and transmit these diseases without developing any symptoms, so these diseases can silently spread and remain undiagnosed and unreported. Discussing the topics of sex and STDs may be uncomfortable for many people, but it is a conversation that needs to be had in order to tackle this important public health issue.

How does Muskegon County compare to Michigan?

Muskegon County STD rates have been consistently higher than the state and national levels since 1994. Using the most recently published county-level data, Muskegon County had the third highest chlamydia rate in the state ranks for 2015 (779.6 per 100,000 population). In the eleven years from 2005 to 2015, Muskegon County was consistently ranked the second or third highest rate at the state level.

<table>
<thead>
<tr>
<th>Year</th>
<th>Muskegon County Rate</th>
<th>Michigan Rate</th>
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</thead>
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<tr>
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<td></td>
</tr>
<tr>
<td>2015</td>
<td>560.3</td>
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</tbody>
</table>

Figure 1: Rate of Reported Chlamydia Cases in Muskegon County, 2005-2014.

SOURCE: Michigan Sexually Transmitted Diseases Database
Gonorrhea is the second most common reported STD in Muskegon County. The infection rate was 237.3 per 100,000 population in 2015, making Muskegon the county with the third highest rate. This was a 54.7% increase from 153.8 cases per 100,000 population in 2014, which ranked fifth at the state level. While gonorrhea rates have fluctuated over time, rates have remained consistently higher than the state average (Figure 2). Recently there has been an upswing in cases in the years of 2014, 2015, and 2016 (Table 1 & Figure 2).

Figure 2: Rate of Reported Gonorrhea Rates in Muskegon County, 2005-2015.

<table>
<thead>
<tr>
<th>Year</th>
<th>Chlamydia</th>
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<tbody>
<tr>
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<td>495</td>
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<tr>
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<td>1,280</td>
<td>265</td>
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<tr>
<td>2015</td>
<td>1,359</td>
<td>410</td>
</tr>
<tr>
<td>2016</td>
<td>1,314*</td>
<td>495*</td>
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</table>

*Preliminary data result, Michigan Disease Surveillance System (MDSS)
How does the rate of chlamydia change within Muskegon County municipalities?

The reported chlamydia cases tend to be most concentrated in urban areas of Muskegon County. Specifically, the highest rates are found within the municipalities of the City of Muskegon, Muskegon Charter Township, and Muskegon Heights.

- In 2015, the highest chlamydia rates were found in Muskegon Heights (2,898 per 100,000 population), followed by Muskegon Charter Township (1,276.71 per 100,000 population) and Roosevelt Park (655 per 100,000 population).

- The number of reported chlamydia diagnoses is associated with population density. Compared to other surrounding municipalities, more cases were identified from urban areas, including the City of Muskegon (102 cases), Muskegon Charter Township (490 cases), Muskegon Heights (313 cases), and Norton Shores City (101 cases). All together, diagnoses from these four municipalities contributed 74.7% (1,006 of 1,347 cases) of the total reported chlamydia cases in Muskegon County (See Figure 3).

Figure 3: Geographic Distribution of Reported Chlamydia Infection Rates by Municipality, Muskegon County, 2015.

SOURCE: Michigan Sexually Transmitted Diseases Database, Michigan Disease Surveillance System (MDSS)
How does the rate of gonorrhea change within Muskegon County municipalities?

Much like the geographic rates of chlamydia, the rates of gonorrhea tend to be concentrated in the more urban areas of Muskegon county.

- In 2015, the highest gonorrhea rate was found within Muskegon Heights municipality (1,074 per population), and followed by Muskegon Charter Township (490 per 100,000 population).
- With a total of 410 reported gonorrhea cases in 2015, Muskegon Heights (116 cases) and Muskegon Charter Township municipality (188 cases) represented 74.1% of overall gonorrhea cases in Muskegon County. These areas represent a very high burden of disease in proportion to the rest of the county (Figure 4).

Figure 4: Geographic Distribution of Reported Chlamydia Infection Rates by Municipality Muskegon County, 2015.
Are there any differences between genders?

Women are hit the hardest with chlamydia. Trend data show at least two-thirds of chlamydia diagnoses occur to women, particularly to young women aged 15 to 25 years old (Figure 5).

- In 2015, the rate of chlamydia among women was 1,106 cases per 100,000 population, which was 2.4 times higher than the rate among men (466.8 cases per 100,000).
- The number of gonorrhea cases are slightly higher among females than males. In 2015, there were 237 cases among females and 173 cases among males in Muskegon County.

Chlamydia does not show any symptoms in 85% of female infections and 40% of male infections. The consequences of not treating chlamydia tend to be much greater among women compared to men. If chlamydia is left undiagnosed and untreated among women, 20% to 40% of infections will result in pelvic inflammatory disease that can lead to serious health consequences including ectopic pregnancy, tubal scarring, infertility, chronic pelvic pain and painful urination.

Due to the higher risk and rates among women, the CDC currently recommends that all sexually active women under the age of 25 should have annual screenings for chlamydia.

Figure 5: Reported Number of Chlamydia Cases by Gender in Muskegon County, 2001-2015.
Are there any racial/ethnic differences in chlamydia rates?

There are substantial racial-ethnic disparities for both chlamydia and gonorrhea infections. African American community experiences significantly higher rates of chlamydia and gonorrhea than any other group.

In Muskegon County, approximately 26,747, or 15.5%, of the population are African American according to population estimates.

- In 2015, African Americans represented more than one half (51.9%) of those with reported chlamydia infections.
- The rate of reported chlamydia cases in African Americans per 100,000 population (2,587.2) was more than 6 times higher than those of non-Latino whites (389.3) (Figure 6).
- The rate of reported chlamydia cases per 100,000 black females (3,624) was 6.2 times that of white females (585).
- The chlamydia rate among African American men was more than 8 times the rate among white men (1,663.2 and 198.6 per 100,000 male population, respectively).

SOURCE: Michigan Sexually Transmitted Diseases Database, MDSS
Are there any racial/ethnic differences in Gonorrhea rates?

- In 2015, African Americans represented more than two-thirds (68.3%) of the 410 cases in Muskegon County.
- The gonorrhea rate for African Americans was 1,047 per 100,000 population, which was more than 13 times higher than that of non-Latino whites.
- The gonorrhea rate for African American females was more than nine times higher than that of non-Latino white females (1,096.9 and 115.9 per 100,000 population, respectively).
- The gonorrhea rate among African American men was 997.9 cases per 100,000 population, which was 25 times the rate among non-Latino white male population (39.7 cases per 100,000 population).

Figure 7: Reported Number of Gonorrhea Cases by Race/Ethnicity in Muskegon County, 2001-2015.

Gonorrhea Rates by Race/Ethnicity, Muskegon County 2015
(Rate per 100,000 Population)

SOURCE: Michigan Sexually Transmitted Diseases Database (MDSS)
What are the differences among age groups?

Nationally, teens and young adults represent one quarter of the sexually active population, but they bear the burden of nearly half of all new STD infections. In Muskegon County, the rates of chlamydia infection among these age groups are even more pronounced. In 2015, More than two-thirds (71.4%) of Chlamydia and over half (58.7%) of gonorrhea cases occurred to the age group 25 and under.

- In 2015, Chlamydia rate was 3,666.5 for the 15-19 age group and 4,331.5 for 20-24 year olds (Figure 8). The gonorrhea rate among 15-19 year olds was 774.2 and the rate for the 20-24 age group was 1,190.3 (Figure 9). The data trend indicates the most at risk group of contracting either chlamydia and gonorrhoea are those aged 20-24.
- Chlamydia diagnosis for the 15-19 age group progressively decreased from 2010 to 2015.

Figure 8: Rate of Chlamydia Cases by Race/Ethnicity in Muskegon County, 2001-2015.

![Reported Chlamydia Rates, by Age Group 2001-2015](image)

Figure 9: Rate of Gonorrhea Cases by Age Group in Muskegon County, 2001-2015.

![Reported Gonorrhea Rates by Age Group 2001-2015](image)

SOURCE: Michigan Sexually Transmitted Diseases Database, MDSS
Implication of Michigan Profile of Healthy Youth (MiPHY) for Muskegon County

In association with the gradual reduction of the chlamydia rate (Figure 10) in recent years among the 15-19 age group, findings from the Muskegon County MiPHY indicate a progressive reduction from 2010 to 2015 in two behaviors associated with a high risk of STD infection (Figure 11).

- The proportion of high school students reported “Ever had sex” declined from 39.7% in 2010 to 30.4% in 2015; a 30.5% reduction rate.

- There was a greater reduction in the proportion of high school students who reported they were currently sexually active — down from 30.2% in 2010 to 21.7% in 2015, a 39.2% decrease between those years.

- While it is encouraging to see the recent decrease in chlamydia infection rates among the 15 to 19 age group, it is concerning that there was an increase of chlamydia infection among those aged 20-24.

Figure 10: Rate of Chlamydia by Age Group in Muskegon County, 2008-2015.

Reported Chlamydia Rates, by Age Group 2008-2015 (Rate per 100,000 Population)

- 20-24 Years
- 15-19 Years
- Muskegon Average

Figure 11: High School Student Sexual Activity in Muskegon County, 2008-2016.

High School Student's Sexual Activity
Muskegon County, 2008-2016

- Ever Had Sex
- Currently Sexually Active

SOURCE: MiPHY is an online student health survey offered by the Michigan Departments of Education and Health and Human Services to support local and regional needs assessment. The MiPHY provides student results on health risk behaviors including substance use, violence, physical activity, nutrition, sexual behavior, and emotional health in grades 7, 9, and 11.
Reinfection and Dual Infection of Chlamydia and Gonorrhea

Having a recent history of chlamydia or gonorrhea infection has been identified as a risk factor for reinfection. Also, since gonorrhea and chlamydia frequently occur together the CDC recommends dual therapy, treating for both infections, when gonorrhea is diagnosed. In order to provide a better picture of STD reinfection and dual infection rates in Muskegon County, PHMC reviewed and analyzed the 2015 MDSS STD data for 1,347 chlamydia cases and 410 gonorrhea cases. Here are the highlights:

- 34.1% of chlamydia cases had previously been infected with the same infection.
- 42.9% of gonorrhea cases reported had previously been infected with other STDs.
- 36.3% of gonorrhea cases were co-infected with chlamydia.

One in Three Cases of Gonorrhea are also Infected with Chlamydia
Muskegon County, 2015

Repeat infections with gonorrhea and chlamydia is associated with an increased risk of reproductive complications. Among women who have had two chlamydia infections, there is double the risk of having an ectopic pregnancy and a 4.5 times increased risk among women who have had three or more infections. Re-infection also magnifies the likelihood of developing pelvic inflammatory disease. The most important factors for reinfection are rapid acquisition of new partners and incomplete partner treatment. Untreated male partners are a likely source of reinfection among women due to men often times not exhibiting symptoms of chlamydia. Chlamydia is asymptomatic within 85% of female infections and 40% of male infections.

Number of Cases Due to a Repeat Infection
Muskegon County, 2015

One in Three Cases is a Repeat Infection of Chlamydia
Two in Five Gonorrhea Cases have a history of Repeat STD Infection

SOURCE: Michigan Disease Surveillance System, MDSS
Summary of Findings

Chlamydia and gonorrhea infections present a silent epidemic in Muskegon County. They are serious sexually transmitted diseases and have become a large public health burden in the community. Effective public health interventions are hindered by a lack of awareness of the risks of engaging in sexual activity and the hidden nature of these diseases.

There are several developing trends of chlamydia and gonorrhea. Muskegon County has rates of infection much higher than the Michigan average. In the last eleven years, from 2005 to 2015, Muskegon County was consistently ranked the second or third highest rate at the state level for chlamydia and gonorrhea. There is significant clustering of both chlamydia and gonorrhea cases within most urban areas. The rates in Muskegon Charter Township, City of Muskegon, and Muskegon Heights are dramatically higher than the surrounding communities.

It appears that the most at risk group of contracting either chlamydia and gonorrhea are those aged 20-24. This most at-risk group has shifted from teenagers to this young adult age group. There has been a significant decrease among high school students in reporting “currently sexually active” and those that have “ever had sex”.

There is a high rate of reinfection and dual infections of chlamydia and gonorrhea. Rapid acquisition of new partners and incomplete partner treatment are the most important factors for reinfection. Also, untreated male partners are likely a source of reinfection among women due to men often times not exhibiting symptoms of chlamydia infection.

The burden of chlamydia is disproportionally higher among females than males, and also much higher among African Americans than Caucasians.

Definitions

Chlamydia is a bacterial infection caused by chlamydia trachomatis. The infection can spread through the genital tract from various types of sexual contact. Chlamydia is a common STD that can infect both men and women. It can cause serious, permanent damage to a woman's reproductive system, making it difficult or impossible for her to get pregnant later on. Chlamydia can also cause a potentially fatal ectopic pregnancy (pregnancy that occurs outside the womb).

Gonorrhea is a sexually transmitted disease (STD) that can infect both men and women. It can cause infections in the genitals, rectum, and throat. It is a very common infection, especially among young people ages 15-24 years.

Data Source and Methods

The Michigan and Muskegon cases and rates were pulled from the Michigan Sexually Transmitted Diseases Database, STD & HIV Prevention Section, Bureau of Epidemiology, Michigan Department of Health & Human Services. The STD cases and profiles are derived from the Michigan Disease Surveillance System (MDSS) a mandatory disease reporting system and can be found at http://www.mdch.state.mi.us/OSR/Chi/STD/frame.asp

The Michigan Profile for Healthy Youth Survey (MiPHY) is an online student health survey offered by the Michigan Departments of Education and Health and Human Services to support local and regional needs assessment. The MiPHY provides student results on health risk behaviors including substance use, violence, physical activity, nutrition, sexual behavior, and emotional health in grades 7, 9, and 11. A summary of the MiPHY data can be found at https://mdoe.state.mi.us/schoolhealthsurveys/ExternalReports/CountyReportGeneration.aspx
References


Suggested citation

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