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*Secondary Analysis of Adolescent and Young Adult Sexual Health in Kalamazoo and Jackson*

*Counties: Chlamydia*

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Bronson School of Nursing

Fall 2013

## **Secondary Analysis of Adolescent and Young Adult Sexual Health in Kalamazoo and Jackson Counties: Chlamydia**

Chlamydia is the most frequently reported bacterial sexually transmitted infection (CDC, 2013). In 2011 alone, it was estimated that 2.86 million infections occur annually (2013). Young adults ages 15-24 are particularly affected accounting for over half of all new sexually transmitted infections (2013). Focusing on the college age level of 20-24, this population accounts for over one-third of total reported new Chlamydia cases (Eisenberg, Lechner, Frerich, Lust, & Garcia, 2012).

Anyone who is sexually active, both men and women, are at risk for this infection, and Chlamydia can be transmitted through vaginal, oral, and anal sex (CDC, 2013). The number of Chlamydia cases reported continues to grow each year. With this infection being so common, especially in young adults, there is no doubt steps need to be taken in order to find a solution to the problem at hand.

The Chlamydia infection often presents with no symptoms (CDC, 2013). For those young adults engaging in sexual behaviors, they could be carrying and passing along the infection to others without even knowing. Most young adults who are sexually active do not take it upon themselves to go get tested (2013). If more precautions such as an increase in education or prevention screenings do not occur in the future, the infection rates will only continue to rise (Eisenberg et al., 2012).

For this thesis, the focus is placed on Chlamydia rates in both Jackson County, Michigan and Kalamazoo County, Michigan. The purpose of comparing these two counties is to see if having a university present in Kalamazoo County increases the reported Chlamydia cases. It is

believed that by collecting this data, there will be an obvious need for implementation of an education intervention for students at Western Michigan University.

### **Literature Review**

Healthy People 2020 (2013) is a nationwide government organization that strives to improve the quality of life of American citizens. It develops health goals aimed toward health-promotion and disease-prevention. This secondary analysis correlates with the Healthy People 2020 goals regarding sexual health behaviors for adolescents. The overall goal of the Healthy People 2020 objectives is to reduce the proportion of Chlamydia trachomatis infections. More specifically the goal extends to reduce Chlamydia infections in adolescents and young adults (15-24). It entails the reduction of the portion of males and females with Chlamydia trachomatis infections attending family planning clinics, enrolled in a national training program and commercial health insurance plans. The final Healthy People 2020 goal regarding Chlamydia is to increase the proportion of sexually active males and females 24 years and under enrolled in Medicaid plans that are screened for genital Chlamydia infections.

Sexual activity and experimentation is beginning prior to young adults entering college. According to Eisenberg et al. (2012), sixty-four percent of high school seniors report being sexually experienced (p. 28). Of this population, twenty-nine percent reported the lack of use of condoms (2012). With proper use of latex condoms being the only way to prevent the spread of STI's, lack of use will only allow these infections to continue to spread.

According to Trieu, Bratton, & Marshak (2011), 59% of the 18 million United States college students are between the ages of 18-24 (p. 744). In regards to this thesis, the focus is on ages 20-24, due to the large amount of Chlamydia cases being reported for this particular age group. This could be related to the high-risk sexual behaviors such as use of alcohol, multiple

and frequent partner changes, and lack of use of condoms that occurs frequently within this age group (2011).

According to the CDC (2013), the higher prevalence among adolescents and young adults of STIs may indicate barriers such as lack of access to health clinics on college campuses. Also, a lack of knowledge of where testing is available on and off campuses. In fact, many colleges and universities prioritize other topics such as influenza and responsible alcohol consumption, over sexual health so there is a lack of education (Eisenberg et al., 2012). In 2009 it was reported that only 52.5% of college students reported receiving information from their college regarding sexually transmitted infections (2012). This number seems too low, especially since this age group has the highest prevalence of STIs.

Lack of proper latex condom use is one of the biggest risk factors for the spread of Chlamydia (CDC, 2013) However, even with proper condom use, those who are sexually active and have multiple partners are still at risk for acquiring an STI. In a study performed by Moore (2013) they found that individuals who reported using condoms were less likely to have ever been tested for Chlamydia. This may suggest that students using condoms perceive that they are taking proper precautions using condoms and see less of a need to get tested, although they indicated a motivation to get tested in the future (2013). With condoms being considered one of the most effective behavioral strategies in reducing contraction of sexually transmitted infections, there is a need for further education regarding this issue (Trieu et al., 2011). Sexual education in general should be the main focus. If more college students were aware of their local resources, and preventative measures, there may be an increase in screening rates of both Chlamydia and gonorrhea.

Perceived lack of risk of requiring an infection is why young adults are not getting tested. In a qualitative study performed by Moore (2013), investigating why college students were not getting tested for sexually transmitted infections in general found that participants seemed to believe that they personally had little risk for contracting an STI. The reasons most often selected by participants for lack of motivation for being tested was believing they were not at risk, followed by those who were recently tested, and then those who stated that their partner had been recently tested, so they did not feel the need (2013). A few were afraid that someone they know might see them get tested. Others were unfamiliar with the testing process (2013). It is obvious from this study, that there is a lack of knowledge and prior education regarding testing and STI's in general with this age group.

Research consensus seems to suggest that there is just an overall lack of knowledge and education about STI's within the 20-24 year old age group. An article by Malbon & Romo (2013), identified the barriers for adolescents to seek healthcare. They included financial concerns, geographical issues or limited access, lack of knowledge regarding the need for preventative healthcare, and trust and confidentiality (2013). They discovered that sexual and reproductive health is often an uncomfortable subject for adolescents to discuss with their family doctor (2013). Most are unaware of confidentiality and fear their family doctor may disclose their sexual behaviors with their parents. Also, most teenagers are unaware that it is their right to see a doctor without a parent or guardian present. Because of the fear associated with disclosing sexual behavior to a family doctor, there is a lack of testing for this age group.

### **Symptoms & Complications**

As mentioned previously, Chlamydia can often go symptomless and that is why it is often referred to as the "silent" infection (CDC, 2013). Symptoms may occur several weeks after

exposure, but regardless of whether symptoms present themselves or not, this infection can damage a female's reproductive system (2013). The incubation period for Chlamydia is typically 7-21 days, so if the patient experiences symptoms, they typically occur within this time frame or after (Black & Hawks, 2009). Symptoms usually begin with burning sensation with urinating or abnormal discharge (2013). If the infection continues to go untreated, it can travel up towards the uterus and fallopian tubes causing Pelvic Inflammatory Disease (2013). Pelvic Inflammatory Disease often causes both abdominal and pelvic pain, but can also go symptomless (2013). Pelvic Inflammatory Disease is a major cause of infertility, ectopic pregnancy, and chronic pelvic pain (CDC, 2011). If the infection continues to go untreated it could even cause infertility (2013).

As for men, symptoms may include discharge or burning during urination (CDC, 2013). If the infection was spread through oral or anal intercourse, inflammation of the rectum or pharynx may be a manifestation for both sexes (Black & Hawks, 2009).

It is reported that only about 10% of males and 5-30% of females with Chlamydia infections experience symptoms (CDC, 2013). Lack of symptoms and education regarding protection against sexually transmitted infections are some of the reasons the rates are still rising for Chlamydia infections in the youth population.

### **Screening**

Chlamydia is diagnosed through either a urine test to look for bacterial cells, or a swab of the cervix or end of the penis (Salamon, 2013). These screenings are recommended for sexually active women under 24, pregnant women, and men and women who have multiple partners or another existing STI (2013). People of all ages should be getting tested if they are not practicing

safe sex or have multiple partners. However, the highest Chlamydia rates are amongst young adults and therefore, it is highly recommended that this age group is screened regularly.

There has been a significant increase in reported Chlamydia cases over the last twenty years. According to the CDC report from 2011, this is due to expansion of screening activities, use of more sensitive diagnostic tests, increase emphasis on reporting methods from providers and laboratories, and overall improvements of the information systems used for reporting. There are still many at risk women and young adults not being tested due to lack of awareness and available resources (CDC, 2011).

### **Treatment**

Treatment of Chlamydia includes use of antibiotics. The antibiotics are either given as a single dose, or a seven-day course (Black & Hawks, 2009). Antibiotics are almost always effective (2009). The CDC recommends for the medications to be dispensed on-site in order to increase compliance (2011). It is also important to make any sexual partners aware of the infection so they can be treated and prevent the spread of the infection to others.

Proper use of latex condoms is one way that this infection can be prevented from spreading (CDC, 2013). It is important that young adults are educated on sexually transmitted diseases and infections such as Chlamydia, so they can take the precautions in order to prevent contraction. They should be aware of the consequences such as infertility if the infection is not treated.

Chlamydia also often occurs more than once in females (Women's Health, 2011). That is why it is imperative that women make their partners aware of the infection so they can be treated as well. It is also important that females take the proper precautions such as using latex condoms properly for protection.

### **Contributing Factors**

There are several contributing and predisposing factors that put young adults at risk for acquiring a Chlamydia infection and many involve lifestyle behaviors. Some other factors that place youth at risk for Chlamydia infections include socioeconomic factors, lack of healthcare coverage, and engaging in risky behaviors such as unprotected sex and alcohol use.

According to the CDC, sexually active young adults are at a high risk of contacting Chlamydia due to a combination of behavioral, biological, and cultural reasons (2013). Lack of condom use and multiple sex partners are two of the main reasons Chlamydia is on the rise for young adults (2013). Lack of education and knowledge regarding Chlamydia infections can also be a contributing factor to the higher rates. For those in lower socioeconomic areas, there are several barriers that prevent them from prevention services such as transportation, cost, lack of insurance, and lack of preventive behaviors (2013).

There are also some contributing factors regarding race and ethnicity. In 2010, African American female and males had the highest Chlamydia rates (CDC, 2011). In fact, the rates for blacks are almost eight times that of whites (2011). This indicates a need of more screening and other preventive measures aimed towards the African American population.

There are a variety of factors, several influencing one another, that contribute to this high rate of Chlamydia infections in young adults under the age of 25. In order to address the array of contributing factors increasing the rates of Chlamydia infection, education for these young adults should be the priority along with awareness of preventative measures. Informing the young adult population that local health clinics offer screening and treatments at a low cost can be an extremely effective measure (Trieu et al., 2011). Also, it is important to make them aware of the lack of symptoms that are associated with Chlamydia infections along with the long-term effects

of untreated infections such as Pelvic Inflammatory Disease and infertility. It is imperative that education starts at an early age because sexual behaviors often begin at a young age.

### **Economic Impact**

STIs place a significant impact on the United States healthcare system economically. In general, the CDC (2013) estimate that the lifetime cost of treating the most common STIs in just one year is \$17 billion. Beyond that estimation, it has the potential to cost individuals even more for a consequential form of an STI, whether it has an immediate or life-long consequence. The annual cost of curable STIs is \$742 million (2013).

Among the STIs treated, Chlamydia is by far the most common, therefore making it the most costly as well. The most recent estimate of the annual cost of Chlamydia infections is \$647 million (CDC, 2013). The lifetime medical cost of Chlamydia has been estimated at an individual level, for men it was an average of \$26 per case and for women it was an average of \$315 per case (2013). Additionally for women, Chlamydia can progress to pelvic inflammatory disease (PID). PID is both a dangerous and costly condition and it is estimated that treatment for a single case of PID can costs anywhere from \$1,060 and \$3,180 (Campbell, 2011).

The annual cost of Chlamydia complications in women is more than \$2 billion (CDC,2013). The CDC (2013) projects that national screening for Chlamydia would cost \$175 million, which would indicate an overall savings of \$12 for every dollar spent on prevention. These calculations however do not include indirect consequences of Chlamydia (2013).

### **Method**

The method of this thesis was to conduct a secondary analysis regarding the prevalence of Chlamydia in both Kalamazoo and Jackson Counties. The goal of this secondary analysis was to obtain concrete evidence in order to help support the need for a sexual health educational

program designed for college students at Western Michigan University (WMU) regarding Chlamydia. Kalamazoo County is being compared to Jackson County, due to the similarities in demographic break down. The main difference between these two counties is that Kalamazoo has a university, whereas Jackson County does not. By comparing these two counties with similar demographics, the prediction is that there will be a significant difference in reported cases of Chlamydia Kalamazoo County due to a university being present. That would serve as evidence that more education needs to be implemented for the students that attend this university.

The primary focus of this thesis is to develop an education program to reduce Chlamydia rates among both males and females aged 20-24 in Kalamazoo County. The targeted age group was 20-24 because young adults account for the highest rates of Chlamydia nationally. Also, it is an age group that accounts for many of the students attending WMU, which may be an indicator of the high rates reported for Kalamazoo County. Institutional Review Board (IRB) was not necessary for this study because it was a secondary analysis and did not use participants, but instead public data that was previously collected.

There were three main hypotheses based on this thesis. First, that there would be a higher prevalence of Chlamydia in Kalamazoo County compared to Jackson County. Next, it was proposed that there would be a steady increase in Chlamydia from 2001-2011. Finally, it was proposed that the increased population from the university and colleges within Kalamazoo County would be a contributing factor to the higher rates of STIs among the college student age group of 20-24.

The overall purpose of this thesis is to provide the necessary evidence that an education intervention needs to be implemented into the campus of Western Michigan University in hopes to reduce Chlamydia rates among college students aged 20-24.

### **County Comparisons**

#### **Demographics**

In comparing the demographics among Kalamazoo County and Jackson County the findings were significant. Table 1, identifies the population differences between Kalamazoo and Jackson County. In total, Kalamazoo County has a larger population by about 90,411. In Kalamazoo County there are more females than males, whereas in the Jackson County there are more males than females. Table 1 also indicates that both Kalamazoo and Jackson County are primarily Caucasian communities. Kalamazoo does have a larger African American community than Jackson County by about 14,527. Looking at the age group of 20-24 year olds that this thesis is focused on, Kalamazoo has a larger population than that of Jackson. Kalamazoo County has 20,550 more 20-24 year olds accounted for than Jackson County.

**Table 1**  
**Demographics: Kalamazoo vs. Jackson (2010)**

	<b>Kalamazoo County (2010)</b>	<b>Jackson County (2010)</b>
<b>Males</b>	122,757	81,710
<b>Females</b>	127,902	78,538
<b>Total population</b>	250,659	160,248
<b>White</b>	204,644 (81.6%)	140,507 (87.6%)
<b>Black</b>	27,266 (10.8%)	12,739 (7.9%)
<b>American-Indian or Alaskan Native</b>	1,059 (.4%)	592 (.3%)
<b>Asian or Pacific Islanders</b>	5,212 (2%)	356 (.2%)
<b>Native Hawian or Other Pacific Islander alone</b>	88	33
<b>Some other race alone</b>	3,815	1,224
<b>Two or more races</b>	8,247	4,016

(United States Census, 2013)

### Characteristics

Both counties are located within the West Michigan area. Kalamazoo County is approximately 66.80 miles from Jackson County. A major difference between Jackson County and Kalamazoo County are the university, private college, and community college that are present in Kalamazoo County. Western Michigan University, Kalamazoo College and Kalamazoo Valley Community College are all located within Kalamazoo County and since these college students live in these locations for the majority of the calendar year, they should contribute to the overall total population. Jackson Community College is located within Jackson County and contributes to the population of Jackson County.

The students that attend the university or community college are not necessarily from Kalamazoo or Jackson County, but may be counted in the United States census regarding the total population of each county. The United States census states that an individual is counted in the census of that county if they live or stay within that city/county for majority of the calendar year (United States Census, 2012). This indicates that majority of college students should be

counted at their college address and not necessarily what their state license indicates. Therefore, out of town students who do not reside in Kalamazoo or Jackson County add drastically to the individual county. It is uncertain if this protocol gets carried out accurately and the United States census has a desire to improve the population census by implementing better protocol for counting college students in the city they live for most of the calendar year (2012).

Table 2 indicates that Western Michigan University alone brings in an average of 25,000 students a semester adding drastically to the population of Kalamazoo (Western Michigan University, 2012). In fall of 2012 the total number of students, both male and female, at Western Michigan University was 24,598 (2012). Table 3 indicates that Kalamazoo College and Kalamazoo Valley Community College brought in an additional total of 12,743 combined (Kalamazoo College, 2012 & Kalamazoo Valley Community College, 2012). Table 3 indicates that Jackson Community College brought in 8,186 students for Jackson County (Jackson Community College, 2012).

**Table 2**  
**Population of Western Michigan University in 2012**

<b>Total Students</b>	24,598
<b>Males</b>	11,857
<b>Females</b>	12,741
<b>Minorities</b>	4,638
<b>Michigan</b>	21,741
<b>Other States</b>	1,282
<b>Other Countries</b>	1,575

(Western Michigan University, 2013)

**Table 3**  
**Student Population at Western Michigan University, Kalamazoo College, Kalamazoo Community College and Jackson Community College (2012)**

	<b>Western Michigan University</b>	<b>Kalamazoo College</b>	<b>Kalamazoo Valley Community College</b>	<b>Jackson Community College</b>
<b>Total Students</b>	24,598	1,348	11,395	8,186
(Western Michigan University, 2012, Kalamazoo College, 2012, Kalamazoo Valley Community College, 2012, Jackson Community College, 2012)				

### **Education**

According to the United States Census Bureau (2012), the total population of Kalamazoo County in 2012 was 254,580, see Table 1. The most recent data provided on population of youth in Kalamazoo is from 2010. At that time there were approximately 16,594 youth ages 16-19 living in Kalamazoo County. Only about 278 or 1.7% were not enrolled in school or working, or have a high school diploma. The only other data that could be obtained regarding education for those living in Kalamazoo County is for the population 25 years and older.

For Jackson County, the United States Census Bureau (2012) estimated a total population for 2012 to be 160,309 as seen in Table 1. The only information that could be found regarding education in Jackson County was for ages 25 and older. Therefore, the targeted age population we are looking at from 20-24, there is no information provided for either county.

### **Poverty**

Poverty is a major issue within the state of Michigan, including Kalamazoo County. Table 4 states that from 2008-2010 Kalamazoo County had an average of 46,091 residents that fell below the Federal poverty guidelines which was 19.2% of the total population (Kalamazoo County Health and Community Services, 2012). From 2008-2010 it was estimated that 15,207 (47.7%) people between the ages of 18-24 lived below the poverty line in Kalamazoo (2012). Ages 18-24 had the highest percentage of people living below the poverty level than any other

age group in Kalamazoo County (2012). This is an alarming statistic. This also is important to consider for this thesis knowing that low socioeconomic status correlates with higher Chlamydia rates (CDC, 2013). Also, with this age group being the focus of this thesis. Additionally, it was indicated that in 2010 a much higher percentage of African Americans (35.8 %) live below the poverty line when compared to Caucasian (12.9 %) (Kalamazoo County Health and Community Services, 2010). This is also an important to consider knowing African Americans are at greater risk than Caucasians for Chlamydia infections (2013).

There was minimal information regarding poverty in Jackson County that was accessible to the public. Table 4 indicates that it was estimated that the average population of people living below the poverty line in Jackson County was 15.7% (United States Census, 2011).

Unfortunately, no information was found regarding poverty by age or race.

**Table 4**

**Average Population of People Living Below the Poverty Line Kalamazoo/Jackson County**

	<b>Kalamazoo (2008-2010)</b>	<b>Jackson (2007-2011)</b>
<b>Percentage</b>	19.20%	15.70%

(Kalamazoo County Health and Community Services, 2010 & United States Census, 2011)

**Analysis**

Our focus age group was 20-24, a typical age group for college students where the findings were the highest. Table 5 data indicates that over a ten-year span from 2001-2011, in both Kalamazoo and Jackson counties, females had the highest number of reported cases of Chlamydia compared to males. This correlates with the national data within the United States for Chlamydia seen in Table 6.

For ages 20-24 in Kalamazoo County, the total reported amount of Chlamydia cases for females in 2011 was 471, see Table 5. This was an increase of 169 cases from 2001. There were some variations within this time span where the rates went up and down. For example, in 2004

the rate in females jumped to 416 from 359 in 2003. In 2005, that number once again went down to 320 in 2005. The rate from 2011, of 471, is the highest rate reported for the whole ten- year time span, which is important as it is the most recent data available.

For Jackson County females ages 20-24, the total reported Chlamydia cases for 2011 was 211. This was an increase of 42 cases from 2001. Jackson has a large variation of the reported cases over the ten-year time span displayed in Table 5. The reported cases increase and decrease over the ten- year time period. Much like Kalamazoo, the 2011 rating in Jackson County of 211 is also the highest from all other reported years. It is evident that in both counties there is an increase in reported Chlamydia cases for females 20-24 from 2001 to 2011, supporting the predicted hypothesis.

Males numbers are also increasing, however, the cases reported for males are not as significantly high as females. In Kalamazoo County Males 20-24 for 2011 had a total of 231 cases reported. This was an increase of 85 cases from 2001. In Jackson County males 20-24 also had an increase in cases from 2001-2011. However, there were 84 cases reported in 2011, which is only an increase of 17 from 2001. Therefore, this is not as large as an increase compared to Kalamazoo County for males.

**Table 5**  
**Prevalence of Chlamydia by reported cases among Females and Males 20-24 Kalamazoo vs. Jackson 2001-2011**

Year	Kalamazoo		Jackson	
	Females	Males	Females	Males
2011	471	231	211	84
2010	407	193	179	64
2009	400	186	170	53
2008	346	168	197	68
2007	335	171	185	57
2006	318	179	172	56
2005	320	154	170	51
2004	416	218	179	69
2003	359	183	134	65
2002	335	139	199	61
2001	302	146	169	67

(Michigan Department of Community Health, 2013)

**Table 6**  
**Chlamydia Cases in the United States Males vs. Females (20-24)**

Year	Males	Females
2011	147,948	393,534
2010	131,686	355,994
2009	120,975	332,946

(Centers for Disease Control and Prevention, 2013)

Table 7 represents to total population of females and males ages 20-24 in both Kalamazoo and Jackson counties. For Kalamazoo County, the total population in 2010 was 250,659. Therefore, 20-24 year olds make up about 12% of the total population in Kalamazoo County. For Jackson County, 20-24 year olds make up about 6% of the counties total population.

**Table 7**  
**Population by Age/Sex in Kalamazoo vs. Jackson**

County	Age	Sex	
	20-24	Male	Female
Kalamazoo (2011)	30,563	15,637	14,926
Jackson (2010)	10,013	5,239	4,774

(United States Census, 2013)

As seen in Table 8, males and females ages 20-24, account for 40% of the total Chlamydia cases in Kalamazoo County for 2011. Indicating a significant problem, specifically to that age group. For Jackson County in 2011, 43% of males and females ages 20-24 account for the total Chlamydia cases. Our hypothesis was that Kalamazoo County would have a larger amount of reported cases for this age group for both sexes, but Jackson County proved to have slightly higher rates. However, Kalamazoo had a total of 1,759 cases for all ages in 2011. Jackson County on the other had only had 687 cases for all ages in 2011. Although Kalamazoo County does have a larger total population, it is still evident that Kalamazoo County has a significant amount of cases reported and therefore some form of intervention would be appropriate.

**Table 8**  
**Percent Distribution of total Chlamydia cases for both sexes 20-24 Kalamazoo County vs. Jackson County 2001-2011**

<b>Year</b>	<b>Kalamazoo</b>	<b>Jackson</b>
<b>2011</b>	39.9%	43.0%
<b>2010</b>	35.5%	36.7%
<b>2009</b>	36.8%	33.0%
<b>2008</b>	33.2%	34.5%
<b>2007</b>	38.8%	33.2%
<b>2006</b>	37.6%	35.9%
<b>2005</b>	39.5%	35.5%
<b>2004</b>	42.6%	35.6%
<b>2003</b>	40.3%	34.9%
<b>2002</b>	39.3%	35.9%
<b>2001</b>	41.8%	35.2%

(Michigan Department of Community Health, 2013)

According to the Michigan Department of Community Health, the total reported Chlamydia cases in 2011 for the whole state of Michigan was 50, 063 (2013). Kalamazoo County contributed to .04% of this total number. Jackson County only account for .01% of the total cases. More specifically, of the total Michigan Chlamydia cases reported in 2011, 18,877

were from young adults ages 20-24 (MDCD, 2013). Kalamazoo County young adults ages 20-24 made up .04% of this reported number. Jackson County young adults 20-24 only made up .02% of the total Michigan cases for this age group.

As seen in Table 9, the number of Chlamydia infections reported for females and males ages 15-19 is also high. This information correlates with that of the national average. Young adults ages 15-24 reported the highest amounts of STI infections (CDC, 2013). For the purpose of this thesis, we focused our attention on the 20-24 age group. One of the main reasons we targeted this age group is because this thesis was created to see if having a university present in Kalamazoo County had any effect on reported Chlamydia cases. The 20-24 year old age group accounts for a vast majority of the college population attending Western Michigan University. Also, it is evident in Table 8 that for our targeted age group of 20-24, both females and males have some of the highest reported rates of all other age groups.

**Table 9**  
**Chlamydia Prevalence in Kalamazoo vs. Jackson County per Age group (2011)**

Age	Kalamazoo		Jackson	
	Males	Females	Males	Females
<b>0-14</b>	5	16	2	10
<b>15-19</b>	146	483	35	180
<b>20-24</b>	231	471	84	211
<b>25-29</b>	79	134	30	69
<b>30-44</b>	91	87	23	34
<b>45+</b>	9	7	6	3
<b>Total</b>	561	1,198	180	507

(Michigan Department of Community Health, 2013)

### **Discussion**

The hypothesis of this thesis was that there would be a higher prevalence of Chlamydia in Kalamazoo County compared to Jackson County. When comparing these two counties, it was found that Kalamazoo County males and females ages 20-24 account for 40% of the total Chlamydia cases for the county. Jackson County males and females 20-24 accounted for 43% of

the total Chlamydia cases. Thus, proving the hypothesis to be false. However, indicated in Table 5, the total number of cases of Chlamydia for all ages in Kalamazoo County was 1,072 more than Jackson County. Indicating that Kalamazoo County in general has a problem with Chlamydia infections as well. It was also predicted that there would be a steady increase in Chlamydia from 2001-2011, this was found true. Based on the analysis of reported Chlamydia case; the hypothesis was supported. Finally, it was predicted that the increased population of each college/university was a contributing factor to the higher rates of STIs among the college student age group 20-24, and it appears that this could be a contributing factor for the increase in incidence in Kalamazoo County, however it cannot be determined if having a university present is the reasoning behind the high reported cases.

The major findings of the thesis are that females have higher rates of STIs than males. The literature indicates that African Americans have a higher rate of STIs than any other race. The age group of 20-24 has one of the highest rates of STIs compares to any other age group with the exception of 15-19. The findings also indicated there is a need for an intervention to reduce the rates of STIs at the college and high school age level.

Overall, Kalamazoo County has a higher population than Jackson County, but regarding demographic breakdown both counties were very similar. They are both predominantly Caucasian and mirrored similar percentages of the population that were other ethnicities. An obvious difference between Jackson County and Kalamazoo County is the two universities and community college that are present in Kalamazoo County. The students that attend these schools contribute drastically to the population, if counted in the census accurately. However, healthcare providers are required to report any case of Chlamydia to the department of public health within the county the individual's license indicates, and not where the STI is diagnosed (Black &

Hawks, 2011). The issue with this is that most college students do not change their address on their license to their college addresses. Therefore, several of the college students that attend Western Michigan University that are diagnosed with Chlamydia are being reported to their hometown counties and not Kalamazoo County.

It was proposed that the additional students that attend Western Michigan University that are not originally from Kalamazoo County are represented in the population. It was also proposed that this contributed directly to the increased rates of sexually transmitted infections in Kalamazoo County over the ten-year time span. However, it was discovered that the cases reported were not identified with being a student at Western Michigan University. There was no proof that the additional population of students at Western Michigan University contributed to an increase of STI cases in Kalamazoo County.

Education is an important factor to consider for this study because lack of education and lower socioeconomic status is associated with an increase in both Chlamydia and gonorrhea rates (CDC, 2013). Unfortunately, there was no information found regarding education levels for the 20-24 year old age group in either county. It could have been beneficial to see the education levels in both counties for this age group to see if there were any associations between the reported rates and low education levels.

Poverty is associated with poor health outcomes. This study confirmed the poverty problem that is current in Kalamazoo County. However, it did not provide much information regarding poverty in Jackson County. Kalamazoo County had an average of 19.2% and Jackson County had an average of 15.7% of the total population that lived below the poverty line. It is suggested that the significant percentage of people living in poverty in Kalamazoo County contributes to the number of cases reported. Additionally, ages 18-24 had the highest percentage

of people living below the poverty level than any other age group in Kalamazoo County, which is also the age group with one of the highest reports of STIs. It was also indicated that a much higher percentage of African Americans live below the poverty line compared to any other ethnic group in Kalamazoo. It is suggested that the overall poverty in Kalamazoo contributed to the high rates of STIs reported. It is also suggested that poverty may contribute to the age group of 20-24 having higher rates of STIs than most age groups. Lastly, African Americans in poverty may have a direct relationship with the high reports of STIs among African Americans.

From all the data collected over the years in both Kalamazoo and Jackson counties, there is an obvious increase of reported Chlamydia infections. STIs have been on the rise over the years and steps have been taken to help decrease the numbers, but the rates of Chlamydia continue to rise. According to Darville (2012), the increase in cases of Chlamydia reported may be due to more efficient screening methods and more people getting tested. In all actuality, Chlamydia rates may not be increasing as much as they appear, but more people are being diagnosed because of better screening methods. In 2002, the screening rate for females' ages 16 to 25 using commercial insurance or Medicaid was 29.8%; in 2008, that rate jumped to 44.7% (2012). In just a short period of time, the screening rate dramatically increased. If the number of screening rates continues to rise there will most likely be more reported cases. Eventually, with more people getting screened, and hopefully treated, there should be a decline in reported Chlamydia cases.

An alternative explanation as to why females have a higher rate of STIs than males may be that females are getting tested more often than males because young women use hormonal birth control, which requires regular physician visits. Moore (2013) found that a gynecological visit in the past year was associated with STI screening. There is a possible link between

Chlamydia and gonorrhea testing and visiting a physician for birth control prescriptions (2013). Females are also getting their first pap smear around 21, which maybe be an indication for such high rates of the 20-24 year old age group.

Other reasons female adolescents are more susceptible to acquiring an STI than males is due to their anatomy (Advocates for Youth, 2010). During adolescence and young adulthood, women are extremely sensitive to sexually transmitted organisms such as Chlamydia because their columnar epithelial cells extend out to the cervix where they are unprotected (2010). As women age, these cells recede to a more protected area (2010). For this reason, adolescent females are at greater risk than adolescent males. Also, males may have lower Chlamydia diagnosis rates because of their lower testing rates compared to females, thus resulting in more undiagnosed cases (Moore, 2013).

There appears to be a correlation between racial and ethnic groups for sexually transmitted infections and other determinants of health such as poverty (Healthy People 2020, 2013). In fact, African American, Hispanic, and American Indian/Alaska Native populations have a higher rate of STIs compared to Caucasians (2013). There is also a correlation between low socioeconomic status and higher STI rates. In low socioeconomic populations, high-risk behavior is common along with compromised access and health-seeking behaviors (2013). Lack of access also presents a major problem. According to Healthy People 2020, groups with the highest rates of STIs are often those from areas that have a lack of access to care (2013).

In an article by Eisenberg et al., (2012), they reported that recent college data indicated that among sexually active college students only 66% of males and 56% females reported use of condoms (2012, p. 940). These reports may not represent complete accuracy because young adults may report the use of condoms, but it cannot be known if this is true. There is no evidence

that can confirm this data. Reality is, condom use is not always a priority for sexually active college students. Of these college students engaging in risky behavior, 15% of them reported being intoxicated the last time they participated in vaginal, oral, and anal sex (2012). When entering college, most young adults begin making choices passed on their increased level of freedom. Most are no longer living with their parents or guardians, and are able to make decisions on their own.

Young adults tend to be curious on trying new activities. This curiosity often leads to an increase use of drugs and alcohol for this age group. There is no doubt that there is a correlation between alcohol use and engaging in unprotected sex. In fact a qualitative study done by Downing-Matibag & Geisinger (2009), interviewed 71 college students to explore their rationales for sexual risk taking. When asked about concerns regarding contracting an STI during a sexual encounter, only about 50% of the interviewed students thought about this consequence (Downing-Matibag & Geisinger, 2009). One of the main reasons they found that students underestimated their susceptibility to acquiring an STI with these random sexually activities is because they placed trust in their partners (2009). Most of them did not feel comfortable discussing STIs with these partners, but they did think that their partners would tell them if they did have an STI (2009). The problem with this is too many young adults are not taking the preventative measures such as condom use when having multiple partners, and many are not getting tested with each new partner. Some of the excuses made regarding lack of use of condoms were that stopping the activity to put on a condom “ruins the mood” and the students also believed condoms “interfere with sexual pleasure” (2009). One of the main findings from the study is the lack of knowledge most college students have regarding STIs and protection from contracting them (2009). In fact, of all 71 students interviewed, not one of them was aware

that STIs could be transmitted through oral sex (2009). With so many college students sexually active, and STI rates on the rise, it is obvious some education and action needs to take place.

### **Limitations**

Overall, the largest limitation is that the information obtained for both Kalamazoo and Jackson County is from 2010-2011. If more recent data was available, it would have been more beneficial for the purpose of this secondary analysis. There was also a limited amount of information available on education in both Kalamazoo and Jackson Counties. For Jackson, the only information that could be found was for 25 years and older. For Kalamazoo the gap of 20-24 was unreported for. Therefore, no information was found regarding education for the targeted age group of 20-24 in both counties.

The lack of ethnic diversity could also be a limitation, but the demographics were similar in both counties. The demographic breakdown for the reported Chlamydia cases for each county was not available for access to the public, so information regarding race for these cases were unable to be obtained. It could have been beneficial to see if African Americans had higher reported cases to see if this correlated with the national data.

Regarding poverty, Jackson County and Kalamazoo County had two different averages for people living below the poverty line. Kalamazoo's average was taken from 2008-2010 and Jackson's average was from 2007-2011. This difference in time spans could be considered a limitation. Also, there was little information regarding poverty in Jackson County.

As far as population, there is little information regarding where a college student counts in the U.S. census. It is understood that the student should count in the population of the city/county they reside in for the majority of the year. However, there is controversy that students may or may not be counted in the population of the city that they attend college in, if

their driver license indicates they are from a different city. This is considered a limitation because the population may not be reliable. There were no reliable sources found to indicate if this information holds true. Also, there is no information provided on how many students enrolled at Western Michigan University is originally from Kalamazoo County. This could also be considered a limitation because that information would be valuable for this analysis.

### **Intervention Recommendations**

Technology is one of the main sources of communication for young adults of this generation. More studies are being conducted to determine if technology can benefit education regarding sexual health among young adults. In fact, Malbon & Romo (2013) looked at a variety of studies to find out effective ways to reach out to youth about sexual and reproductive health (p. 534). It was their belief that there may be benefits to the use of technology and text messages to educate youth. It is imperative that youth gain knowledge regarding healthy sexual behaviors in order to help reduce the number of STIs and teen pregnancies.

According to Malbon & Romo (2013), “the use of technologies and social media is widespread among adolescents and these tools have the potential for better healthcare delivery as well as improved health outcomes” (p.355). In fact, the average adolescent aged 12-17 owns at least 3.5 gadgets (2013). Primarily, adolescents use their phones to send and receive text messages. Several studies have been conducted to determine if the use of text messaging is beneficial in improving youth’s knowledge regarding safe sexual practice. So far, text messaging has been used for results, partner notification services, health education messages, treatment reminders, and direct communication between patients and health providers (2013). This allows teenagers to ask questions to their doctor that they may too uncomfortable to ask in person. Unfortunately, there are a limited amount of studies that have been carried out to see how

efficient the use of text messaging is. The one study that was used texting as a method to inform patients of their sexually transmitted infection were both diagnosed and treated sooner (2013). Another study indicated that participants really enjoyed receiving information about sexual health through text messages (2013).

Based on the research regarding educating young adults about sexual health through text messages, it is believed that this source of communication could be beneficial for students at Western Michigan University. The targeted population will be all incoming freshmen who are typically moving from a city other than Kalamazoo and who are unaware of their resources on and off campus. The information should be available for everyone, but it is vital that we start educating students immediately as they enter college during the transitional segment of their lives.

Texting is a major form of communication for college students, it is quick and it reduces the anxiety of face-to-face interaction. The research from Malbon & Romo (2013) has shown that texting has been beneficial in educating students on college campuses. Also, college students actually enjoyed receiving information regarding sexual health through text message. This plan would have to have an extensive amount of organizing and planning, but it is the belief that it would be highly beneficial to create a program that offers text messaging regarding sexual health on campus at Western Michigan University.

Sindecuse Health Center at Western Michigan University has a Sexual Health Peer Education Program that certifies students enrolled at Western Michigan University through Planned Parenthood and makes them a sexual health peer educator. These sexual health peer educators are in an ideal situation to take hold of this plan. Each peer educator is required to do

one office hour a week. If students are texting a number that is linked to a website each peer educator could respond weekly to the questions from students.

### **Conclusion**

All in all, there is definitely a need for education in any area where sexually transmitted infections are present. In Kalamazoo more specifically, there is a university, private college, and a community college that contain a large portion of the population in Kalamazoo. Young adults 20-24 hold some of the highest rates for this county, therefore, focus needs to be placed on students at Western Michigan University. Overall, more needs to be done to advocate resources on campus and off campus that these students have available regarding sexual health.

Although the hypothesis of Kalamazoo County having a higher statistical rate of Chlamydia due to having a university in comparison to Jackson County did not hold true, there are still several indications that more needs to be done. In fact, for 2012 the Michigan Department of Community Health ranked Kalamazoo County 6th of highest Chlamydia rates in Michigan (2013). With Kalamazoo County being ranked in the top ten for Chlamydia, there is no doubt that steps need to be taken in order to find resolutions to the problem at hand.

Research should begin with surveying Western Michigan University students regarding sexual health promotion and sexual health education all together. This may be an extremely long process, but research indicates that students at four-year institutions do not feel that adequate sexual health education is offered (Eisenberg et al., 2012) Additionally, further research should be conducted to determine if the text message education at Western Michigan University could be successful in reducing rates of Chlamydia in Kalamazoo County. The overall hope is that students at this university become more educated in sexual health and this leads to a reduction in Chlamydia rates for the county.

Overall, this thesis has shown that Chlamydia is a prevalent problem for college-age students. Focusing on Kalamazoo County and Western Michigan University, are the first steps of many toward achieving the overall goal of Health people 2020 regarding STIs.

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