

Wright State University

CORE Scholar

Scholarship in Medicine - All Papers

Scholarship in Medicine

2023

The Importance of Sexual Education on Adolescent Sexual Behaviors

Ryan Hill

Jacqueline Stephens

Follow this and additional works at: https://corescholar.libraries.wright.edu/scholarship_medicine_all



Part of the [Public Health Education and Promotion Commons](#)

The Importance of Sexual Education on Adolescent Sexual Behaviors

Ryan Hill and Jacqueline Stephens
Scholarship in Medicine Final Report
2023

Abstract

Objective: The objective of this report is to examine how sex education for adolescents living in rural and urban settings in the states of Alabama and Ohio impacts their sexual health and behaviors. *Methods:* To explore this topic, several different statistical tests were done: an independent t-test, an ANOVA test, a Pearman/Spearman correlation, a regression, and a standard correlation. The reason for these different tests was to compare the difference in the number of sexually transmitted diseases, how insurance status correlates with teenage pregnancy rates and sexually transmitted diseases, and the relationship between socioeconomic status and the rate of sexually transmitted diseases.

Results: We found that there are a multitude of factors that influence sexual behaviors and health of teenagers: the type of county they live in (rural or urban), their socioeconomic status, insurance status, and type of household. Therefore, it is imperative that these healthcare disparities are combatted so that underserved teenage patient populations can have improved rates of sexual health and have access to sexual health resources that can enhance their health status and overall patient care outcomes.

Key Words: adolescent sexual health, sexual education, sexual behavior, teenage pregnancy

Introduction

Sexual education has been an important topic of discussion since many teenagers start exploring their sexuality during their adolescence. However, sex education has not been uniform across the United States and different states have their own regulations about how the topic of sex should be taught to students and what topics should be included in sex education courses. According to a 2015 article published by the American Psychological Association, “..the Guttmacher Institute report[ed] that 25 states require sexuality education programs to stress abstinence...12 states..must cover abstinence as one option among many of protecting youth from sexual risks and dangers, while 30 states require educators to inform students as to the perceived negative outcomes of teen sex...Within sexuality education programs, only 19 states require educators to discuss contraception. Twenty states require sexuality education classes to counsel teens about healthy decision-making. The numbers are even more dismal for conversations about sexual orientation—just 13 states require inclusive approaches to considering LGBT/Q issues, while three require that educators offer negative instruction about LGBT/Q sexualities”¹.

While there are many different topics and discussions that can be taught in a sexual education curriculum, there is also debate between the type of sexual education program that is more beneficial in reducing the rate of sexual activity and sexually transmitted diseases among the adolescent population, and whether these two goals can be best achieved using an abstinence-only or comprehensive sex education curriculum. According to a 2022 survey, rural high school students in Indiana did not relate to the current sex education content that was being taught to them, which was abstinence-only-until-marriage sex education. In fact, this survey stated that young people frequently resist abstinence-only education and want information that helps keep them safe sexually.²

Both studies from 2015 and 2022 indicate that sexual education of adolescents in the U.S. is an important issue in order to promote healthy sexual behaviors and increase sexual healthy literacy. In addition, adolescents engaging in sexual behaviors and activities are influenced by a variety of factors. The type of sexual education program, race, household environment, and religious background impact the decisions teenagers make regarding whether or not they will engage in sexual activity.

However, topics of conversation surrounding sex education among adolescents that is lacking in significant research is the differences in the type of sex education between urban and rural populations, and how sex education for lesbian, gay, bisexual, and transgender teenagers affect their sexual behaviors. Therefore, these gaps lead to the specific topic of exploring how teenagers living in rural and urban populations in Ohio and Alabama impact the number of sexually transmitted infections and teenage births in this population. Understanding this information is critical because countless youths are exposed to potentially life altering diseases and this could be prevented simply with better education and improving health outcomes of teenage populations.

Research Questions

- RQ1: What is the difference in the number of sexually transmitted diseases between the states of Alabama and Ohio?
- RQ2: What is the difference in teen birth rates between rural and urban counties in OH and AL?
- RQ3: How does being uninsured correlate with teenage pregnancies and sexually transmitted diseases in Ohio and Alabama?
- RQ4: How does income inequality and adolescents from single-parent households predict the rate of sexually transmitted diseases among residents in Ohio and Alabama?
- RQ5: What is the relationship between SES and STDs transmission rate?

Methods

The data we collected in this article comes from the County Health Rankings website. The variables that are specifically being analyzed are the number of sexually transmitted diseases in rural and urban counties in the states of Alabama and Ohio, the difference in teenage pregnancy rates, and how uninsurance status and income status affect sexually transmitted diseases in rural and urban counties in these two states.

There are several different tests that are being conducted to analyze these different variables. An independent t-test is utilized to evaluate the difference in the number of sexually transmitted diseases between populations in Alabama and Ohio. To analyze the difference in teenage birth rates between rural and urban counties in Alabama and Ohio, an ANOVA test was utilized. To determine how uninsurance status correlates with teenage pregnancies and sexually transmitted diseases between these two states, a Pearson/Spearman correlation was performed. When examining how income inequality and adolescents from single parent households influence the rate of sexually transmitted diseases, a regression test model was employed. For inspecting the relationship between socioeconomic status and the rate of sexually transmitted diseases, a correlation test was performed.

Data Collection

The data was obtained using County Health Rankings, a program of the University of Wisconsin Population Health Institute. Data from every county in Ohio and Alabama from the 2022 year was available for use on the site. Data from the variables of teen birth rate, chlamydia rate, uninsurance rates, percent of children in single parent households, percent of rural residents, and median household income rate were collected and used. Uninsurance rate data per county was collected from Small Area Health Insurance Estimates and then assigned a percent value out of 100. The National Vital Statistics System (NVSS) is where the birth data was collected from measured per 1000 females aged 15-19 from 2014-2020. Data on median household income rate came from the Small Area Income and Poverty Estimates program. From this data, urban counties were qualified as those having a median household income >50% while rural counties were defined as 50% or lower. The data on chlamydia rates came from the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP) measured in the number of new cases per 100,000 patients. The data on children in single-parent households was found by using the American Community Survey, 5-year estimates and converted into a percent out of 100. Last, the data reporting on the number of citizens living in rural areas came from the 2010 Census Population Estimates and was reported as a percent out of 100.

Data Analysis

An independent t-test was utilized for RQ1, and an ANOVA test was conducted for RQ2. RQ3 was investigated using post-hoc tests. A stepwise linear regression model was applied to RQ4, and a Pearson correlation test was employed for RQ5.

Results

To analyze the research question on the difference in number of sexually transmitted diseases between the states of Alabama and Ohio (RQ1), an independent t-test was conducted. When comparing the amount of chlamydia cases between Ohio and Alabama, there was a significant difference between the two states, with there being 616.26 cases per 100,000 people in Alabama while there were 351.33 cases per 100,000 people in the state of Ohio ($t = 7.369$, $p < 0.001^*$) (Table 1).

Table 1: Chlamydia Rate in Ohio and Alabama in 2022

State	n	Mean	Standard Deviation
Alabama	67	616.285	276.9969
Ohio	88	351.327	168.1308

When assessing if there was a difference in the prevalence of teenage births in urban counties and rural counties in both Alabama and Ohio (RQ2), an ANOVA test was performed and showed there was a significant difference in teenage birth rates between rural and urban counties in Alabama and Ohio ($F = 20.452$, $p < 0.001^*$). Post hoc tests showed that urban Ohio had significantly lower teenage pregnancy birth rates (21.65) compared to rural Ohio (25.63), urban Alabama (27.44), and rural Alabama (33.80) (Table 2).

Table 2: Teenage Pregnancy Birth Rates Between Ohio and Alabama in 2022

	n	Mean	Standard Deviation
Rural Alabama	19	33.800	7.9813
Urban Alabama	48	27.442	6.7580
Rural Ohio	45	25.163	8.3976
Urban Ohio	43	21.651	1.1994

Research question 3 led us to examine several dependent variables to determine if they were associated with each other. Primarily the goal was to determine how being uninsured/insured would affect the number of STDs transmitted or the number of teenage births. There was found to be a statistical significance between all three of the variables. The relationships between being STD rate and teen birth ($r = 0.241$, $p < 0.002$) (Figure 1), uninsured and STDs transmission rate ($r = 0.328$, $p < 0.001$) (Figure 2), and uninsured people and teenager births ($r = 0.584$, $p < 0.001$) (Figure 3).

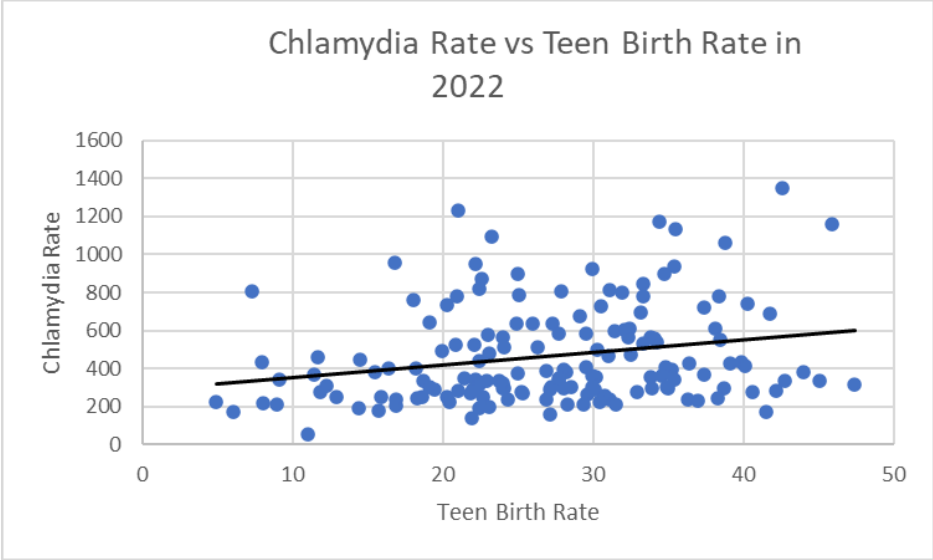


Figure 1.

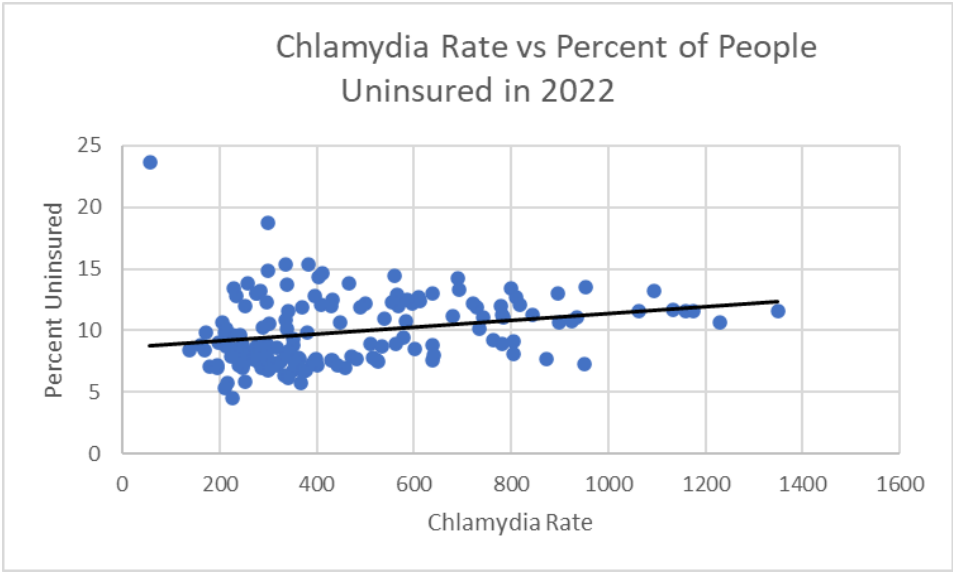


Figure 2.

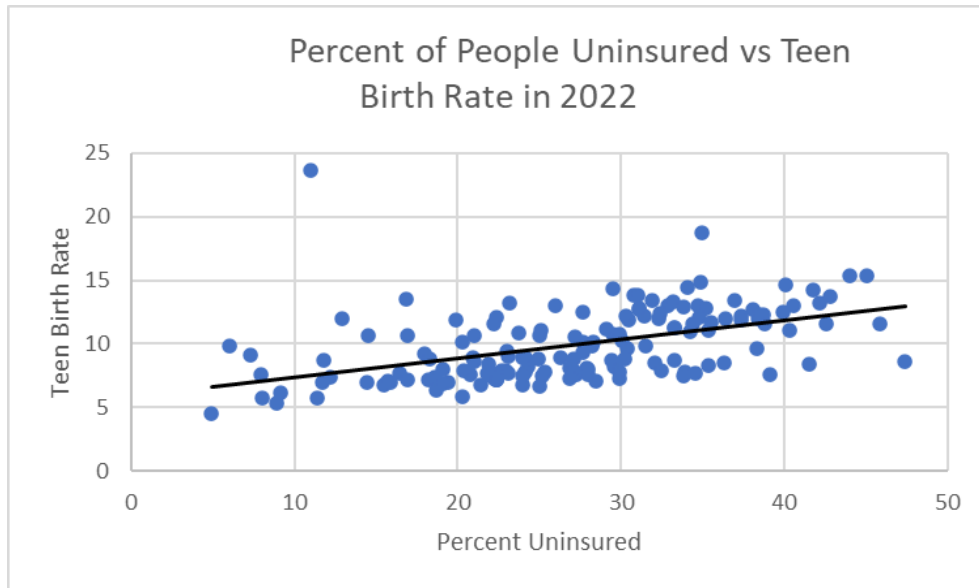


Figure 3.

Our fourth research question attempted to analyze the effects of a single parent household and SES on STD transmission. A stepwise linear regression indicated the best fitting model was significant ($F = 174, p < 0.001$) which accounted for 69.2% of the variance in STD transmission. Single parent households contributed most to the model ($B = 16.106, t = 12.308, p < 0.001^*$) whereas the income ratio was more noticeable when already taking single parent households into consideration ($B = 49.320, t = 2.806, p = 0.06^*$).

SES and STD were analyzed in our fifth research question. A Spearman correlation test was run between the chlamydia rate and the median household income per county in Ohio and Alabama shown in Figure 4. The results were found to be statistically significant ($r = -0.453, p < 0.001^*$) (Figure 4). This implies that the higher the median household income, or SES, the less STD transmission there was.

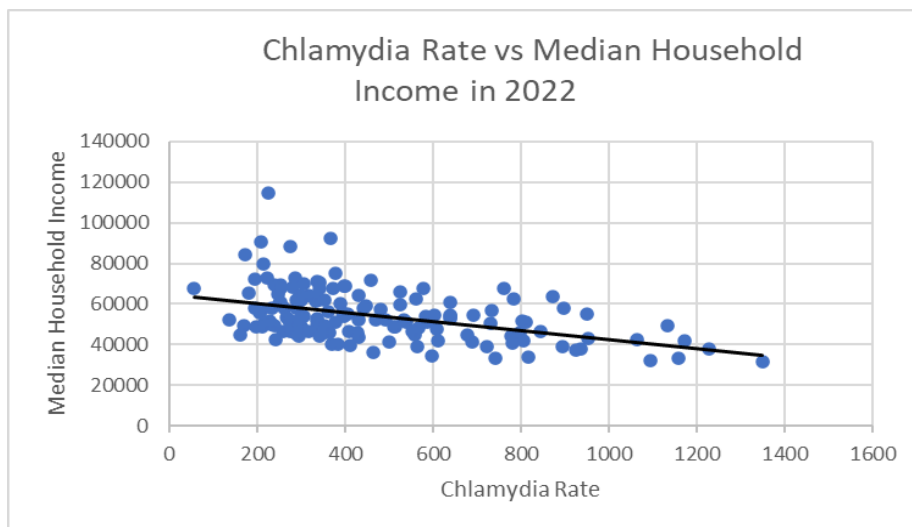


Figure 4.

Discussion

Sexual health is a major healthcare issue in the United States, especially among adolescents. There have been many studies that have been conducted that have evaluated what contributes to adolescent sexual activity, such as sex education programs. There are different types of sexual education programs- some programs are abstinence only, some teach teenagers about contraceptive use, and others teach about saying ‘No’ to sexual intercourse if one does not want to engage in intercourse and informing adolescents about the different forms of contraception for safe sex. According to a 2006–2008 National Survey of Family Growth article published in the *Journal of Adolescent Health*, there was a positive association between both male and female students receiving sex education. For students that did not receive any form of sex education, they were more likely to engage in riskier behaviors.³ While this data indicates the advantages and positive benefits of teenagers receiving sexual education, it must be mentioned that sexual education is not equally accessible to all demographic groups. From the same study mentioned previously, it was found that one third of teenage men of color in the study had not received any form of sexual education, abstinence, or birth control methods, prior to engaging in their first sexual encounter. Furthermore, adolescents who did not receive any type of sex education were from a lower socioeconomic background, were black or Hispanic race and ethnicity, had higher rates of sexually transmitted infections, higher rates of teenage pregnancy, and had worse sexual and reproductive health behaviors.³ These findings are supported by our data in figure 4, which was examining the relationship between the chlamydia rate and the median household income per county in Ohio and Alabama. This relationship was significant ($r = -0.453$, $p < 0.001$) and demonstrated that the higher the median household income, or SES, the lower the STD transmission rate.

Our data correlates with the data collected from County Health Rankings in several ways. One correlation is when comparing chlamydia rate and median household income which were found to share a moderately strong negative association (Table 4). This is expected as areas with lower SES tend to have fewer resources and less comprehensive sexual education. Similarly, insurance works as a good measure of sexually transmitted diseases and teenage births with a strong negative correlation. The more people tended to be uninsured, the more teenage births and STDs were likely to occur. In turn, the people that are uninsured tend to be people of lower SES and those that are more likely to have not received a sexual education. In a 2018 study, it was concluded that adolescents living in areas with the highest poverty rate had higher case rates of both chlamydia (5489.91/100,000 person-years) and gonorrhea (1573.73/100,000 person-years) compared to adolescents living in urban areas. Furthermore, there was a strong positive relationship between poverty and chlamydia and gonorrhea infection rates.⁴

Furthermore, there has been research that has investigated the impact and significance of sexual education programs on the sexual health of adolescents and teenagers. In an article published in the journal, *Sexuality Research and Social Policy*, 48 comprehensive sex education programs in the U.S. According to the article, a comprehensive sex education is defined as, “curricula that emphasize abstinence as the safest behavior but also promote the use of condoms or other forms of contraception for those who do have sex.”⁵ To continue, it was found that nearly half of the 48 comprehensive programs delayed the initiation of sex in the adolescent population and increased contraceptive and condom usage. These findings

emphasize the importance of sex education programs being accessible to teenage youth of all backgrounds because it helps promote safe sexual health outcomes and alleviates health disparities in the amount of sexually transmitted diseases and infections and teenage pregnancies that impact different groups of adolescents. To continue, this data supports our argument that sex education programs need to be accessible to teenagers living in both rural and urban populations since there are health disparities in the type of sexual behaviors and health outcomes that impact rural teenage populations more significantly than urban teenage populations.

Along with the *Sexuality Research and Social Policy* journal article, another article from the *Journal of Adolescent Health* established the idea that there are significant differences in the sociodemographic factors that impact different groups of teenagers and the type of education that they receive.⁶ Teenagers that were black, from low-income families, and lived in rural areas generally received no sex education. Teenagers that received abstinence-only sex education were younger and from low to middle income families that had an intact family structure. Teenagers that received comprehensive sex education were white, older, from higher income families, and lived in urban areas.⁶ Another study found that states that have a higher proportion of Caucasian teenagers emphasize abstinence less in their sex education programs and have lower teenage pregnancy and birth rates compared to poorer states. Furthermore, states with higher proportions of black teenagers emphasized abstinence more in their sex education curriculum.⁷ This data information is crucial in understanding the discrepancies of sexual health programs and outcomes on adolescent populations because, “the more strongly abstinence is emphasized in state laws and policies, the higher the average teenage pregnancy and birth rate. States that taught comprehensive sex and/or HIV education and covered abstinence along with contraception and condom use tended to have the lowest teen pregnancy rates.”⁷ Additionally, a 2021 study found that some sexual behaviors increase the risk of unintended pregnancy.⁸ In this 2021 study, students from high-poverty schools were more likely to be sexually active compare to students from low-poverty schools yet had a significantly lower percentage of hormonal birth control use from their last encounter (18.5%) compared to students attending low-poverty schools (36.2%).⁸ These results are indicated in the data that was found in this paper in Table 2, which showed that both urban Alabama (27.442 cases per 100,000 people) and urban Ohio (21.651 cases per 100,000 people) had less teenage birth rates compared with rural Alabama (33.800 cases per 100,000 people) and rural Ohio (25.163 cases per 100,000 people). Moreover, a 2021 article from the *American Journal of Public Health* further supported our data since adolescents living in rural areas have less access to healthcare providers providing contraception and the receipt of sexual health education may be less common in rural communities.⁹

To examine this issue more closely and specifically see if there was a wide difference between states we chose two states, Ohio and Alabama to examine. These states are different in values, population, SES, and demographics of the people living in them. Sexually transmitted diseases, specifically chlamydia, were found to be nearly double in Alabama in comparison to Ohio (Table 1). This finding was surprising as the difference was wider than one might expect given that this data comes only from two different areas in the same country. Due to this, it highlights the importance of many different variables factoring into one big, complicated issue. To examine this closer, Alabama and Ohio counties were separated into rural and urban groups based on whether the number of people living in poverty was >50%.

Teenage birth rate was examined in these four different groups and the findings were what would be expected. Rural Alabama has such a high rate that there is some factor in those areas making it substantially different from the rest of the groups. Urban Ohio had the lowest birth rate and was shown to have some level of protective factors that urban and rural Alabama did not have. Rural Ohio showed interesting results being only noticeably different from rural Alabama implying a unique combination of factors. This data has a lot of implications that need to be more looked into, but the overall data continues to support that those with lower SES are less likely to have adequate education and are more susceptible to risky sexual behaviors.^{6,8}

While there is much research on the benefits of how sex education programs improve sexual health outcomes among adolescent populations, this research is limited because much of the existing data focuses primarily on heterosexual teenage sexuality. Much of the current research literature often educates students on heterosexual and heteronormative sexual practices. Lesbian, gay, bisexual, and transgender (LGBT) health is often left out of the curriculum. According to a 2015 study published in the *Journal of Sex Research*, because there are deficits in in-person sex education programs, many LGBT adolescents use the internet to search for information on different sexual health topics. Furthermore, LGBT youth experience sexual health disparities compared to heterosexual adolescents. These disparities include higher rates of Human Immunodeficiency Virus (HIV) infections among homosexual male teenagers and increased risk of teenage pregnancy among females who identify as lesbian or bisexual.¹⁰ While this is not a lot of research in this area, many of the disparities can be explained due to the lack of LGBT adolescents having support from their peers, family, positive role models, and in some cases, suffering from internalized homophobia because of the deficit in sex educational resources. In addition, a 2018 article found that LGBT adolescents would prefer an inclusive sex education curriculum that explains safe sex practices for activities that are more commonly practiced among homosexual populations, such as oral and anal sex, and what preventative measures they can take to decrease the risk of HIV transmission.¹¹ Therefore, providing LGBT-inclusive sex education curriculum and programs to adolescents would greatly improve the health outcomes of this sexual minority population.

Additional limitations to this research include not specifying what type of sexual education programs are employed in rural and urban areas. For instance, it is important to know if sex education programs in rural and urban areas in the states of Alabama and Ohio are utilizing comprehensive curriculum or abstinence-only curriculum. Furthermore, it would also be interesting to research what are the specific policies in these areas regarding sexual health resources. Knowing this would influence the type of sex education curriculum taught in schools, which ultimately affects the sexual health outcomes of adolescent students. These gaps in the data prove that more research is crucial in the discussion of sexual education and sexual behaviors of teenagers living in both rural and urban populations in Alabama and Ohio. To continue, if more data can be collected on specific sex education curriculums being taught, this could potentially spark interest in implementing policy changes and health access resources that promote health equity and quality education that does not differ between whether a teenager lives in a rural area or an urban area.

The data on how sex education programs influence the sexual behaviors of LGBT youth is limited. It would be interesting to explore how non-heterosexual and non-cisgender teenagers in rural and urban areas in Alabama and Ohio are being affected the abstinence only and comprehensive sex education curriculums, and how state policies address health needs for LGBT teenagers. Addressing this type of information could help improve the plethora of health disparities seen in LGBT teenage populations. Doing research on sex education resources for LGBT adolescents living in rural and urban populations could help implement new policy changes and curriculum changes, as well as increase the likelihood of better sexual health outcomes among LGBT sexually active teenagers.

Conclusion

These data findings are interesting because assumptions and stereotypes about sexual activity and sexual behaviors based on socio-demographics are not at the choosing or fault of the teenagers themselves. Rather, they are the products of the environments and institutions and systems in which they live. If students in rural areas are not offered sex education courses or if they come from less educated, poorer, and unstable family units, they are more likely to engage in sexual risk-taking behaviors that negatively impact their sexual health. In addition, not only is just implementing a sexual education curriculum in a low-income and underserved school essential, but also the quality of these sex education programs. Teenagers should be educated on all their options regarding sex, such as abstinence, condom usage, and contraception use. In addition, if possible, school nurse services or counseling services should be provided or encouraged if students have any questions or end up contracting a sexually transmitted disease or infection or becoming pregnant. This is why advocating and providing sex education resources in underserved areas and for rural and minority populations can help reduce the health inequities in the rates of sexually transmitted diseases and teenage pregnancy rates. The importance in the improvement of these disparities can have a significant impact on the long-term health outcomes of vulnerable and underserved groups beyond the scope of this paper, such as reducing the number of unwanted pregnancies and the maternal health disparities and infant mortality seen among minority patients.

Sexual health is a complicated but important issue that many Americans are poorly informed about, especially adolescents. This results in unsafe sexual behavior being very frequent across the country and resulting in high levels of sexually transmitted diseases and teenage pregnancy rates. The main contributing factor of poor sexual education is there are few to no restrictions on who is allowed to teach about this subject in school and what kind of material is required to be taught. Abstinence-only education continues to be the most commonly given education, but it has been proven to be ineffective at helping the issue. On the other hand, in cases where comprehensive sexual education is used, there have been positive results and an overall increase in safe sexual behaviors. Many studies have been conducted that have validated this conclusion many times, but there are more factors that contribute to this issue. Being uninsured, growing up in a single-parent household, or living in a more rural area were all found to be associated and could even predict the level of unsafe sexual behaviors. The majority of this data, however, could possibly be explained by the level of sexual education offered where the people live, but this data was not available. The next step would be to adjust the level of sexual education and determine if the factors found in this paper were

still statistically significant. This would reveal whether these factors truly contribute to unsafe sexual behaviors. Sexual health is an important issue that more research is needed on to truly understand and determine the best ways to improve it.

References

1. Fields J, Gilbert J, Miller Mi. Sexuality and Education: Toward the Promise of Ambiguity. In: *Handbook of the Sociology of Sexualities*. Handbooks of Sociology and Social research; ISSN: 1389-6903 (Print). Springer International Publishing/Springer Nature; 2015:371-387. doi:10.1007/978-3-319-17341-2_21
2. Harris TL, Shields A, DeMaria AL. Relevant, Relatable and Reliable: Rural Adolescents' Sex Education Preferences. *Sex Education*. 2022;22(3):304-320. doi:10.1080/14681811.2021.1931086
3. Lindberg, L. D., & Maddow-Zimet, I. Consequences of Sex Education on Teen and Young Adult Sexual Behaviors and Outcomes. *Journal of Adolescent Health*. 2012; 51(4): 332– 338. doi:10.1016/j.jadohealth.2011.12.028
4. Pinto CN, Dorn LD, Chinchilli VM, Du P. Chlamydia and Gonorrhea Acquisition Among Adolescents and Young Adults in Pennsylvania: A Rural and Urban Comparison. *Sex Transm Dis*. 2018;45(2):99-102. doi:10.1097/OLQ.0000000000000697
5. Kirby DB. The Impact of Abstinence and Comprehensive Sex and STD/HIV education Programs on Adolescent Sexual Behavior. *Sexuality Research & Social Policy: A Journal of the NSRC*. 2008;5(3):18-27. doi:10.1525/srsp.2008.5.3.18
6. Kohler PK, Manhart LE, Lafferty WE. Abstinence-Only and Comprehensive Sex Education and the Initiation of Sexual Activity and Teen Pregnancy. *Journal of Adolescent Health*. 2008;42(4):344-351. doi:10.1016/j.jadohealth.2007.08.026
7. Stanger-Hall KF, Hall DW. Abstinence-Only Education and Teen Pregnancy Rates: Why We Need Comprehensive Sex Education in the U.S. *PLoS ONE*. 2011;6(10):1-11. doi:10.1371/journal.pone.0024658
8. Underwood JM, Pampati S, Everett Jones S, et al. School-Level Poverty and Rurality Associated with Differences in Sexual Risk Behaviors Among U.S. Public High School Students. *J Adolesc Health*. 2021;69(6):964-969. doi: 10.1016/j.jadohealth.2021.06.005
9. Orimaye SO, Hale N, Leinaar E, Smith MG, Khoury A. Adolescent Birth Rates and Rural-Urban Differences by Levels of Deprivation and Health Professional Shortage Areas in the United States, 2017-2018. *Am J Public Health*. 2021;111(1):136-144. doi:10.2105/AJPH.2020.305957
10. Mustanski B, Greene GJ, Ryan D, Whitton SW. Feasibility, Acceptability, and Initial Efficacy of an Online Sexual Health Promotion Program for LGBT Youth: The Queer Sex Ed Intervention. *The Journal of Sex Research*. 2015;52(2):220-230. Accessed April 11, 2023. <https://search-ebsochost-com.ezproxy.libraries.wright.edu/login.aspx?direct=true&db=edsjsr&AN=edsjsr.43701816&site=eds-live>
11. Dressel, Candice P., "The Efficacy of Formal Sexual Education in LGBTQ Adolescents: A Review of the Literature" (2018). Honors Undergraduate Theses. 391. <https://stars.library.ucf.edu/honorsthesis/391>