

Investigating the timeless susceptibility of undergraduate college students for contracting and transmitting sexually transmitted infections: A historical analysis

Aliyah Silver

University of Maryland

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Professor Angelella

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National rates of sexually transmitted infections (STIs) are at an all time high and college aged undergraduate students continue to contract and transmit them at a rate disproportionately higher than any other demographic group. The timeless causes of this health disparity date back to the 1990s, and range from factors as simple as condom usage and number of sexual partners to more complex factors such as levels of sexual self-efficacy and various obstacles to obtaining screening and testing. The effects of these factors are clear and negatively contribute to both the growing STI and HIV/AIDS epidemics. This historical analysis will review literature from the 1990s, early 2000s and present day, to discuss the relevance of critically analyzing the history of eerily similar STI trends over the past decades for devising the necessary innovative solutions required for successful resolution of increased rates of STIs among undergraduate college students.

## **Introduction**

Sexually transmitted infections (STIs) are defined as infections whose primary mode of transmission occurs through sexual contact (Mandal, 2013). There are approximately 20 known STIs, some of the most common and well known being chlamydia, gonorrhea, genital herpes, HIV/AIDS, syphilis, and human papillomavirus (National Institute of Child and Health Development, NIH, 2013). For decades, college students have been at a particularly high risk for contracting sexually transmitted infections. This paper will provide an in-depth historical analysis of the history, biological mechanism, present day importance, historical causes and effects, and overall implications and applications of the research presented on sexually transmitted infections, with a specific focus on undergraduate college students, as they are amongst the population most susceptible for contracting sexually transmitted infections.

## **History, biological mechanism & importance of sexually transmitted infections**

Sexually transmitted infections have been prevalent in humanity for many eras. However, advancements in medicine, technology, and education have changed people's perceptions and behavioral approaches to addressing them. STIs were first seen in ancient times, and were thought to be punishment for poor sanitation, poor hygiene and leading sacrilegious lifestyles (Burg,

2012). As Burg notes, in the medieval times, there was a general recognition of the correlation between sexual activity and STIs, but the public still remained generally uneducated, preventing treatment and allowing transmission. Burg also notes that between the late 15th century and early 19th century, various misinterpretations and lack of education regarding STIs led to further fallacies about STIs. Finally, from the late 19th century through the 20th century, education and scientific advancements gave way to an understanding of the various causes, treatments, and types of STIs and shifted the public perception of STIs from a fatal plague to an important public health issue that needs to be addressed (Burg, 2012).

As previously stated, the primary means of transmission for all STIs is sexual contact. However, there are many different types of STIs, and each are caused by different pathogens including bacteria, viruses, and other microorganisms that cause disease (WHO, 2016). While some STIs can be transmitted simply by skin-to-skin contact with an infected partner, the primary route of transmission of STIs is via mucous membranes, which are especially thin areas of skin in the throat, genital areas and other common body parts that come in contact during sexual activity. (Mandal, 2013). Specifically, mucous membranes permit microorganisms and infected bodily fluids to cross the membrane, providing access to the body and blood stream where they replicate and colonize (Mandal, 2013). Once infected, the individual's body recognizes the bacteria and virus and acts accordingly, causing the individual to potentially experience one or many of a wide range of physical symptoms that include genital itching, discharge, sores, blisters, rashes, pain or burning with urination and/or sexual intercourse, and more seriously, a compromised immune system (Mandal, 2013). However, many STIs present no obvious physical symptoms or signs, posing additional threat to both the infected individual and those individuals who they come into contact with (The Office of Adolescent Health, HHS,

2016). While antibiotics can cure bacterial STIs, viral STIs are incurable and therapies and medication can be taken only to manage symptoms of the infection (WHO, 2016).

STIs are a prominent public health concern due to their increasing rates and relationship to the HIV/AIDS epidemic. Between 2013 and 2014, national cases of chlamydia, gonorrhea and syphilis increased, for the first time since 2006, by alarming rates of 2.8%, 5.1% and 15.1% respectively, demonstrating that STI rates are at a record high (Centers for Disease Control and Prevention, 2014). It is important to note that these rates only represent the three most common STIs that are required to be reported and therefore represent only a small fraction of the STI problem – there are many other STIs that go unreported and likely follow similar trends. It is equally as important to note that young adults age 15-24 are disproportionately affected by sexually transmitted infections and acquire half of all 20 million new, reported cases of STIs each year despite being only a small portion of the sexually active population (Centers for Disease Control and Prevention, 2014). That is, the national and increasingly high rates of STIs can be attributed, in large part, to young adults age 15-24. Such an enormous disparity is one that needs to be addressed. STIs are also a subject of importance today because their increasing rates cause an increased risk for long-term health issues when left untreated and increased susceptibility of acquiring human immunodeficiency virus (HIV), both of which are serious negative health consequences (Siegel, Klein & Roghmann, 1999).

### **Causes and effects of STIs as seen in historical research trends**

In the literature, there seems to be a general consensus that high rates of STIs amongst undergraduate college students are historically due to a variety of factors that lead to high-risk sexual behavior. Additionally, increased rates of sexually transmitted infections among college undergraduate students can be attributed not to a lack of concern about the risk of contracting an

STI or a lack of education on safe sexual practices, but rather to a choice to disregard education and fail to follow safe sexual practices (Joffe, 1992). The subsections that follow will discuss the various historical causes and effects of high rates of STIs among undergraduate college students through the discussion of previous research. The studies presented were conducted in undergraduate college students by means of self-reported questionnaires or interviews.

### ***Multiple sexual partners***

Perhaps one of the biggest causes of high rates of sexually transmitted infections among college students is the prevalence of multiple sex partners. College students are at an increased risk for contracting STIs because they have multiple sexual partners, frequently change sexual partners, and/or have cumulative sexual contact due to serial monogamy (Arnold, Fletcher & Farrow, 2002; Siegel, Klein & Roghmann, 1999). One notable cause of multiple sex partners is alcohol consumption, with one study finding that 59.1% of sexual activity with multiple partners being preceded by alcohol consumption (Desiderato and Crawford, 1995). In one study of sexually active undergraduate college students during the first 11 weeks of school, more than one third of students reported having more than one sexual partner (Desiderato and Crawford, 1995). Of those students who reported having multiple sexual partners, 24% of them reported having at least one STI, compared to the only 16.3% of students who reported having only a single partner (Desiderato and Crawford, 1995). In another study, researchers found that the percentage of undergraduate women who reported having an STI increased with their number of partners, with woman having 5 or more sexual partners were 8 times more likely to report having an STI than those with only one partner (Joffe et. al, 1992). Study results are consistent across the literature – having contact with multiple sex partners increases the risk of contracting and/or transmitting an STI because it increases the chance that one will come in contact with an infected partner.

***Failure to use condoms***

Failure to use condoms consistently, if at all, is another cause of high rates of STIs among undergraduate college students. Across the literature, many studies of undergraduate college students have found that sexually active students are not using condoms. In one study, Strader and Beaman found that while the majority of students were sexually active, only 40% had ever used a condom, while in another study, Watkins and Akamatsu found that only 23% of sexually active students in their study always or almost always used condoms (Lewis, Malow & Irelans, 1997). Lack of condom use has been found to be correlated with multiple sex partners, with one study finding that only 18.8% of students with multiple sex partners used condoms consistently compared to the 29.8% of students with a single partner (Desiderato and Crawford, 1995). Lack of condom use has also been found to be inversely proportional to sexual pleasure and psychological sensation seeking (Lewis, Malow & Irelans, 1997; Arnold, Fletcher & Farrow, 2002). That is, studies have found that condom usage is low because it is correlated to an inhibition of sexual pleasure and because college students often pursue sensation-seeking behaviors, which are decreased with condom usage. In addition to the sexual comfort (pleasure) that comes without condom usage, personal comfort is another reason why condom usage is low, as feelings of embarrassment accompany purchasing condoms and students are uncomfortable discussing condom use with their partners (Lewis, Malow & Irelans, 1997). Failure to use condoms can also be attributed to the increased importance on the use of contraceptive methods solely as a means to prevent pregnancy, placing more emphasis on the use of oral contraceptive methods (which do not prevent STIs) and less on condoms (Siegel, Klein & Roghmann, 1999; (Lewis, Malow & Irelans, 1997). It is important to note that the failure to use condoms is not due to a lack of education, but rather a choice – one study found that while 87% of sexually active

college students recognized that condoms were effective in preventing the transmission of HIV and other STIs, only 15% consistently used them with every sexual encounter (Lewis, Malow & Irelans, 1997). These results are also consistent across the literature and have an obvious effect – increased risk of contraction and transmission of sexually transmitted infections due to unsafe and direct contact with vulnerable mucous membranes.

***Lack of perceived vulnerability and sexual self-efficacy***

Another cause of high STI rates among college students is a lack of perceived vulnerability and a lack of sexual self-efficacy (the ability to achieve behavioral outcomes that have enhanced protective aspects) (Lewis, Malow & Irelans, 1997). Undergraduate college students as a whole do not feel that they are at risk for contracting STIs. In one study, more than 75% of sexually active undergraduate students believed that their friends were more likely to contract HIV/an STI than they were, with only 10% correctly recognizing their own likelihood (Lewis, Malow & Irelans, 1997). In another study, 50% of the studied undergraduate students perceived low vulnerability to contracting an STI and the majority of students had a low perception of vulnerability if they only went as far as oral sex (Downing-Matibag & Geisinger, 2009).

In addition to a low perception of vulnerability, low sexual-self efficacy contributes to increased rates of STIs. Undergraduate college students as a whole do not feel comfortable enough to initiate sexually protective conversation or behavior. Even though college student have high efficacy in safe sexual knowledge, they are low in their ability to discuss STIs and use preventative behaviors (Downing-Matibag & Geisinger, 2009). In addition to the discomfort in discussing condom usage discussed above, one study of sexually active undergraduate students found that only 14% of students reported that their partner was tested prior to the initiation of

sexual activity (Siegel, Klein & Roghmann, 1999). Another study found that students generally do not disclose their sexual history, with 16.7% of students who were HIV positive not disclosing this information to their partners, over one third of students failing to inform their partners of past STIs, and about half of all students failing to inform current partners about previous partners and previous failures to use condoms (Desiderato and Crawford, 1995). Desiderato and Crawford also found that rates of disclosure decreased as number of sexual partners increased.

Undergraduate students' lack of perceived vulnerability and low sexual self efficacy have the effect of indirectly increasing rates of STI contraction and transmission among undergraduate college students. Both factors lead to a lack of having necessary sexual health related discussions (i.e., about sexual history and testing) as well as a lack of safe sexual practices (i.e., condom use), which as previously discussed directly leads to increased chances of contracting and transmitting STIs.

### ***Failure to get screened or tested for STIs***

A final cause of high STI rates among college students is the failure to get screen or tested for STIs. One study found that a failure to get screened was associated with many factors including perceived negative consequences (i.e., embarrassment, concern about negative public perception as “loose” or “dirty”), negative personal emotions (i.e., fear about how test could affect future, shame, guilt), low perceived vulnerability, low perceived health severity of STIs (especially compared to HIV/AIDS), and various testing factors including poor reputation of public and campus health clinics, cost, and confidentiality (Barth et. al, 2002). Failure to get preventively screened or tested even in the presence of symptoms, allows for further and widespread transmission of infections among the undergraduate college student population.

Perhaps the biggest effect (from a public health perspective) of all causes that promote increased rates of contraction and transmission of STIs is the increased risk of HIV contraction and transmission, which negatively contributes to the current HIV/AIDS epidemic. Numerous public health studies have confirmed the association between STI contraction and transmission and increased HIV contraction and transmission, noting that infection with an STI further increases risk of HIV transmission through disruption of the mucous membranes and recruitment of HIV target cells to the genital tract and genital secretions (Ward & Ronn, 2010). Infection with HIV progressively leads to AIDS, which compromises the immune system and even causes death.

There is no one cause of increased rates of STIs, as many of the causes are multifaceted and intertwined. However, with all causes of increased sexually transmitted infections among undergraduate students, there seems to be a general failure to translate the knowledge and risks known into preventative practices, thus allowing further contraction and transmission of STIs, and potentially the contraction and transmission of HIV/AIDS.

### **Historical analysis, present day application & discussion**

Based on data collected in the 1990s, in their 2000 [STI] Surveillance Report, the Centers for Diseases Control noted that young adults and adolescents age 10-24 were at a higher risk for acquiring [STIs] than any other population, even at a time when national [STI] rates were steadily decreasing. Consistent with historical research, the report attributed this disparity to the increased likelihood of young adults to have multiple sex partners and unprotected intercourse (Centers for Disease Control and Prevention, 2001). Similarly, in their 2014 [STI] Surveillance Report, the Centers for Diseases Control noted that young adults and adolescents age 15-24 were at an even higher disproportional risk for acquiring [STIs] than any other demographic, during a

time where [STI] rates are increasing and at an all time high. Also consistent with historical research, this report attributed the increased risk for contracting and transmitting STIs in this age population to social and cultural conditions that lead to sexual-risk taking behaviors and various barriers to seeking STI screening and treatment (Centers for Disease Control and Prevention, 2015).

The point to be made from these national surveillance reports is that though the majority of the studies presented in this historical analysis are from the 1990s and early 2000s, they are undoubtedly applicable to the present day undergraduate college student population. The previous research discussed in this historical analysis highlights that failing to get screened or treated for STIs, failure to use condoms, multiple sex partners, and various other factors that lead to high risk sexual behavior were all causes of increased rates of STIs in undergraduate students in the 1990s and early 2000s. According to the 2014 STI surveillance report, these causes from the 1990s and early 2000s are essentially identical to the causes for increased rates of STI contraction and transmission in the current day undergraduate college aged population. In comparing the STI health disparity seen in college aged students today to that of the 1990s, there are striking similarities, and the causes are largely unchanged.

An additional point to be made is that with over two decades passing, STI rates have continued to increase in college-aged students. Whether national STI rates were generally decreasing (1990s-early 2000s) or increasing and at an all time high (present day), undergraduate college aged students were the most vulnerable population, contracting and transmitting STIs at a rate disproportionately higher than any other group. Knowing that causes are essentially the same today as they were in the 1990s makes past research even more relevant to the present day reader because it is a clear indication that the root causes of increased rates of STI transmission in

college aged students have not been successfully addressed over the past decades. The data presented is also an indication that the problem has worsened, as STI rates have only increased in college aged students, despite having the same causes as they did two decades ago. Successful resolution of this important health disparity (and a portion of the HIV/AIDS epidemic) will come only once critical historical analysis of the issue of STIs is used to develop innovative solutions, since previous efforts towards resolution have been undoubtedly ineffective.

### **Conclusion**

The issue of high rates of STIs among college students is a multifaceted and seemingly timeless issue that needs to be critically analyzed (historically) in order to have successful resolution. While national rates of STIs have fluctuated between the 1990s and present day, one thing has remained constant; that undergraduate college-aged students contract and transmit sexually transmitted infections at a disparagingly higher rate than any other demographic of the population due to various factors that lead to high-risk sexual behavior and prevent preventative practice.

### **Future directions**

While the causes of increased rates of STIs in undergraduate college students are clear and consistent, an important question that remains to be answered is what has been done in the past (or present) to attempt to resolve this issue and why has it been ineffective. In order to have successful resolution of this public health issue, one must first analyze the techniques that have been used in the past 2-3 decades to pinpoint exactly what needs to be changed.

One method that researchers could use to do this is to compare historical programs aimed at reducing STIs in college students to those programs of the present day. Specifically, researchers can analyze the factors that each program targets (i.e., various contraceptive

methods, sexual health education, screening and testing) and determine what is most effective through both surveying the undergraduate student population and looking at their overall reported STI rates. These results can be compared across universities nationwide to determine which factors are most effective and which are least effective. For example, because it is known that college students have high efficacy in sexual health knowledge, researchers might find (through collected survey data and STI rates) that institutional programs that prioritize sexual health knowledge are largely ineffective compared to those that prioritize the use of various methods of contraception and free testing. Such information can be used to implement programmatic change and develop new solutions.

There is a clear need for novel health education materials, techniques and public health campaigns aimed directly at helping undergraduate college students translate the sexual health knowledge that they have into positive and preventative behavioral change. This can only be achieved through further historical and present day analysis of causes and attempted solutions to effectively assess the needs of college undergraduate students with respect to STI contraction and transmission rates.

### Annotated Bibliography

Arnold, P., Fletcher, S. & Farrow, R. (2002). Condom use and psychological sensation seeking by college students. *Sexual and Relationship Therapy*, 17(4): 355-365.

This source is attainable to the general academic audience interested in the topic of lack of condom use in college students. It is a credible source, as it is published in an academic journal, objective, and uses research and literature review to support stated claims. The author uses a self-report questionnaire method to assess the relationship between condom use, levels of sensation seeking (in terms of sexual activity) and STI rates in undergraduate students. For the current historical analysis, this paper was useful because it allowed for discussion of a specific cause for why undergraduate college students are at an increased risk for contracting and transmitting STIs; lack of condom use due to psychological sensation seeking.

Barth, K.R. et. al (2002). Social stigma and negative consequences: factors that influence college students' decision to seek testing for sexually transmitted infections. *Journal of American College Health*, 50(4): 153-159.

This source is credible and authentic as it is published in a credible journal, objective, and uses research and literature review to support stated claims. The author uses a self-report study method to assess factors that inhibit undergraduate college students from getting tested for STIs. The paper is readily understood and intended for anyone with an interest in college health as it relates to STIs. This quality paper was useful for the purposes of the present historical analysis because it allowed for in-depth discussion of another cause of increased rates of STI contraction and transmission in undergraduate college students; failure to get screened or tested due to negative personal emotions, low perceived vulnerability, cost, and various other obstacles of obtaining STI testing and screening.

Burg, G. (2012). History of sexually transmitted infections (STI). *Giornale Italiano di Dermatologia e Venereologia*, 147(4): 329-40.

This paper, published in an academic journal, and therefore seemingly credible gives an in depth history of STIs. The paper discusses the transition from the ancient time perception of STIs being a consequence of poor hygiene to the late twentieth century view of STIs as an important public health issue, addressing every era in between. As a result, this paper would be an excellent resource for anyone who wants information on the history of STI epidemics, public perceptions pertaining to STIs, and progressive advancements that allowed for better understanding and addressing of STIs. For the purpose of this historical analysis, this paper was useful in providing a historical account of STIs to help establish present day relevance.

Centers for Disease Control and Prevention. (2001). *Sexually transmitted disease surveillance 2000*. Atlanta, Georgia: U.S. Department of Health and Human Services.

This 2000 report is written by the Surveillance and Data Management Branch of the Centers for Disease Control and Prevention and so is generally accepted as credible and authentic. The report features a comprehensive analysis of STI rates, statistics and trends from before and during 2000 in the United States with various sub focuses on different reportable STIs, as they relate to different demographic and geographic groups. This report is comprehensive, of high quality and would be useful for anyone wishing to obtain national, demographic or infection specific STI information for at and before the year 2000. For the purpose of my historical analysis, this report was used to help establish historical context, discuss age specific historical STI rates, and to use as a point of comparison for present day age-specific STI trends found in the 2014 surveillance report.

Centers for Disease Control and Prevention. (2015). *Sexually transmitted disease surveillance 2014*. Atlanta, Georgia: U.S. Department of Health and Human Services.

This 2014 report is written by the Surveillance and Data Management Branch of the Centers for Disease Control and Prevention and so is generally accepted as credible and authentic. The report features a comprehensive analysis of STI rates, statistics and trends from before and during 2014 in the United States with various sub focuses on different reportable STIs, as they relate to different demographic and geographic groups. This report is comprehensive, of high quality and would be useful for anyone wishing to obtain national, demographic or infection specific STI information for at and before the year 2014. For the purpose of my historical analysis, this report was used to help establish present day importance for the topic of STIs (as data shows that STIs are at an all time high), discuss present day age specific STI rates, and to use as a point of comparison for historical age-specific STI trends found in research and the 2000 surveillance report.

Desiderato, L.L. & Crawford, H.J. (1993). Risky sexual behavior in college students:

relationships between number of sexual partners, disclosure of previous risky behavior, and alcohol use. *Journal of Youth and Adolescence*, 24(1): 55-68.

This article is credible and authentic as it is published in a credible journal, objective, and uses research and literature review to support stated claims. The paper is likely intended for anyone in the academic audience interested in historical causes of increased STI rates in college students. It uses a self-report questionnaire based method to discuss condom use, sexual-self efficacy, alcohol use, and student concerns as they relate to STI prevalence in the population. This quality paper was useful for the purposes of the present historical analysis because it allowed for discussion of various historical causes of

increased STI rates in undergraduate college students; low sexual-self efficacy, failure to use condoms, and multiple sexual partners.

Downing-Matibag, T.M. & Geisinger, B. (2009). Hooking up and sexual risk taking among college students: a health belief model perspective. *Qualitative Health Research*, 19(19): 1196-1209.

This source is credible and authentic as it is published in a credible journal, objective, and uses research and literature review to support stated claims. The source is readable for the general academic audience interested in the topic, and uses a self-report interview method in college students to assess the relationship between sexual self-efficacy, sexual knowledge efficacy, and perceived vulnerability and STI rates. This high quality paper was useful for the purposes of the present historical analysis because it allowed for discussion of various causes of increased STI rates in undergraduate college students; low sexual-self efficacy and low perceived vulnerability.

Joffe, G.P. et. al (1992). Multiple partner and partner choice as risk factors for sexually transmitted disease among female students. *Sexually Transmitted Diseases*, 19(5): 272-8. This source is credible and authentic as it is published in a credible journal, objective, and uses research and literature review to support stated claims. The author uses a self-report study method of undergraduate college students to demonstrate the link between multiple sex partners and increased rates of STIs. The paper is of high quality and readily understandable and accessible to the general audience. It was useful for the purposes of the present historical analysis because it allowed for discussion of the effects of having multiple sex partners (a historical cause) on increased rates of STIs in undergraduate college students.

Lewis, J.E., Malow R.M., & Irelans, S.J. (1997). HIV/AIDS Risk in Heterosexual College Students: A Review of a Decade of Literature. *Journal of American College Health*, 45(4): 147-158.

This article is credible and authentic as it is published in a credible journal, objective, and uses research and literature review to support stated claims. This high quality paper is attainable for the general academic audience and discusses over a decades worth of literature on STIs (mainly HIV/AIDS) and discusses the research conducted on college students as it relates to various determinants of increased STI rates. The source was useful for the purposes of the present historical analysis because it provided an extensive literature review on STIs and undergraduate college students (providing general context for which the historical analysis could be based on) and an array of historical research studies on a key cause of increased STI rates in college students; failure to use condoms.

Mandal, A. (2013). STD Pathophysiology. *News Medical*. Retrieved from <http://www.news-medical.net/health/STD-Pathophysiology.aspx>

This article, written by a medical doctor, is credible not only because it is from a person well versed with the medical field, but also because she documents reliable primary sources. This article is intended for the lay, everyday reader and talks about the biological cause and mechanisms of STIs (mucous membranes) and provides an overview of symptoms associated with some of the most common STIs. This article was a quality source for the purpose of my analysis as it allowed me to define STIs, how they are transmitted, and their biological mechanisms.

National Institute of Child Health and Human Development, National Institutes of Health (2013).

What are some types of sexually transmitted diseases or sexually transmitted infections (STDs/STIs)? Retrieved from

<https://www.nichd.nih.gov/health/topics/stds/conditioninfo/pages/types.aspx>

This article is from the National Institutes of Health's National Institute of Child Health and Human Development, and so is generally understood as credible and authentic. The author describes the most important information, causes and effects of nine of the most common sexually transmitted infections. This is a helpful source for people who want a general overview on any of the covered infections and was useful for defining and introducing the topic of STIs in my historical analysis.

Siegel, D.M., Klein, D.I., & Roghmann, K.J. (1999). Sexual behavior, contraception, and risk among college students. *Journal of Adolescent Health*, 25: 336-343.

This source is credible and authentic as it is published in a credible journal, objective, and uses research and literature review to support stated claims. The author used a questionnaire-based study in undergraduate college students to assess the relationship between risk sexual behaviors and their associated risks for increased STI rates. It is an easily understood source intended for anyone with an interest in young adult and adolescent health as it relates to STIs. The publication is of high quality and allowed for discussion of the importance of STIs in the current historical analysis, as well as the historical causes of increased STI rates in undergraduate college students; multiple sex partners, failure to use condoms and low sexual-self efficacy.

The Office of Adolescent Health, U.S. Department of Health & Human Services (HHS) (2016).

*Sexually Transmitted Diseases*. Retrieved from <http://www.hhs.gov/ash/oah/adolescent-health-topics/reproductive-health/stds.html>

This article is credible, as it cites credible primary sources and is written by the Department of Health and Human Services. It is an extremely abbreviated article and clearly intended for the lay audience, specifically for young adults and adolescents, as well as their parents, who want resources to learn more about STIs and STI related services. The article briefly describes how adolescents are related to high STI rates, provides resources for adolescent STI services, and resources for learning more about

STIs as they relate to adolescents. This article was largely poor quality and irrelevant for the purposes of this historical analysis and only allowed for presentation of a problem that STIs present with regards to increased transmission; that most prevent no physical symptoms in an infected individual.

Ward, H., & Ronn, M. (2010). The contribution of STIs to the sexual transmission of HIV. *Current Opinion in HIV and AIDS*, 5(4): 305-310.

Though highly credible, this article is published in an HIV/AIDS specific journal, is extremely dense, and likely intended for medical officers in the field of public health or biology researchers that conduct research specifically on HIV. The article establishes and analyzed the association between STIs contraction and transmission with that of increased risk for contracting HIV. For the purposes of this historical analysis, this publication was useful in establishing the present day importance of increased STI rates, an effect of high rates of STI contraction and transmission (increased risk for contracting HIV) and providing a biological mechanism for why this happens.

World Health Organization (WHO). (2016). *Sexually transmitted infections (STIs)*. Retrieved from <http://www.who.int/mediacentre/factsheets/fs110/en/>

This article, written by officials of the World Health Organization is objective, factual and credible. This article is intended for persons who want a quick worldwide overview on the scope of the problem of STIs. It provides succinct information on how STIs are transmitted, the scope of the worldwide STI epidemic, methods for the prevention of STIs, and how their organization is responding on a global level. For the purposes of this historical analysis, this article allowed for effective explanation of the pathogenic means for transmission of STIs and the effects of STIs in the human body.