Waking up from “A Night with Venus”: A discussion of anthropological and biological responses to syphilis and their implications for the United States

Accepted 24th August, 2017

ABSTRACT

Perhaps one of the most prevalent, yet stigmatized diseases known to humankind, syphilis has affected all walks of life from nobles such as King Henry VIII of England to the mercenaries who served him and all the way to the many people who still suffer from the bacterially-caused disease today. Throughout its history, syphilis has been perceived as an “immoral” disease, with its transmission due to sexual contact. Since the disease was arbitrarily viewed as a punishment for sin, treatments were often harsh. The use of Galenic theory became popular in the early sixteenth century and involved the purging of sweat and saliva through guiac and mercury treatments to balance the body’s humors by ridding it of excess “phlegm.” However, with the development of the germ theory and other advancements during the scientific revolution of the mid-eighteenth century, microbiotic treatments were experimented with to find scientific cures for the specific causative bacterium, Treponema pallidum. Eventually, penicillin was discovered by Alexander Fleming in 1928 and developed into a successfully curative intramuscular injection by John Mahoney and his colleagues in 1943. Despite penicillin’s existence as a successful treatment for syphilis, structural violence and prejudice against those affected by the disease from government and healthcare officials caused disparities in the availability and quality of care. This eventually led to an increase in the incidence of syphilis in the early 2000s, despite eradication efforts of the Centers for Disease Control. The HIV-syphilis co-infections that accounted for the recent rise in syphilis cases were catalyzed by the persistence of several socio-cultural factors including cultural attitudes and stigmatizations, inequalities in economic access and isolation from the national community due to the political system. Therefore, high-risk populations continue to suffer—not because of a lack of available treatment, but because of the perpetuation of structural violence against them. By analyzing the turbulent interaction between the biological impact of syphilis on human populations and the cultural ideas and stigmatizations that have accompanied the disease over several centuries, this paper seeks to assess the socio-cultural factors that have inhibited the eradication of syphilis and draw conclusions on how future incidents of syphilis should be treated, both medically and socially, on both the individual and collective levels.

Keywords: Syphilis, socio-cultural factors, treatments, penicillin, Treponema pallidum.

NATURAL HISTORY, PATHOLOGY AND ETIOLOGY OF THE "GREAT POX"

Perhaps one of the most prevalent, yet stigmatized diseases known to humankind, syphilis has affected all walks of life from nobles such as King Henry VIII of England to the mercenaries who served him (Hays, 1998), all the way to the many people who still suffer from the bacterially-caused disease today. Waging a war of its own, venereal syphilis made its first noted appearance in Italy during the French invasion of Italy in 1494 to 1495 when Italian physicians noticed for the first time a presentation of a particular pattern of symptoms on some French soldiers’
bodies. They described the display as a “generalized eruption consisting of pustules, more terrifying than leprosy and elephantiasis that could be lethal and was transmitted through sexual intercourse,” (Tampa et al., 2014). The disease, eventually to be known as syphilis, would cause an epidemic throughout all of Europe by 1499, spreading swiftly to other areas of the world, including the Middle East, North Africa, and eventually as far as China, all before the year 1510.

The bacterium responsible for the epidemic is the gram-negative spirochete *Treponema pallidum* (CDC, 2015), which is thought to have spread during the French invasion due to the “dirty, ill-disciplined” armies of the era (Hays, 1998). Since *T. pallidum* is spread primarily through sexual contact, multiple mercenary armies easily spread the disease over the 30 years of wartime by marrying local females or by engaging in rape and/or prostitution (Tampa et al., 2014). Each of these affected soldiers had engaged in sexual contact with a syphilitic’s mouth, genitals, or rectum, enabling the *T. pallidum* spirochete present in the lesions or mucous membranes of the syphilitic to enter through small abrasions or sores on the skin or mucous membranes of the soldier’s body (Romito and Jones, 2014). As we now know, once the spirochete inoculates the opening, it disseminates through the lymphatic system and blood (Peate, 1998), which it is able to do because of its unique structure. Since they each have a flagellum that resides within the periplasmic space inside the cell, *T. pallidum* spirochetes have the ability to penetrate through complex tissues in the host's body in order to find a moist, dark environment in which it can reproduce and thrive (Limberger, 2004).

After passing the immune system’s first non-specific (or innate) defense—specifically, the physical barrier of the skin or mucous membrane as well as, the chemical barriers existing on each (secretions of oil on skin and mucous on membranes)—the spirochete begins to reproduce in the bloodstream. This initiates the body’s second non-specific defense—the inflammatory response. Histamines are released by the damaged tissue cells of the abrasions through which the spirochete entered, causing the capillaries to dilate and become more permeable for blood flow to increase the temperature to inhibit the growth of possible pathogens and bring white blood cells to the area. Neutrophils immediately begin to phagocytize pathogens until they become overwhelmed, secreting cytokines to trigger macrophages for continuing to phagocytize pathogens. Since non-specific defenses fail to prevent *T. pallidum* infections due to the spirochetes’ ability to enter deeper tissues and into the bloodstream by passing through the connections between endothelial cells, the specific (or adaptive) defenses come into play (Mader and Windelspecht, 2016).

*T. pallidum* appears to initiate a cell-mediated adaptive response (Pavia et al., 1978), where T cells (T lymphocytes) released from the thymus recognize spirochete antigens by linking its T-cell receptors with a piece of the spirochete displayed in the groove of a major histocompatibility complex (MHC) on the surface of an antigen-presenting cell (APC). Once the T cell is activated, it forms daughter cells that can recognize the antigen and seek out and destroy spirochetes while leaving normal body cells unharmed (Mader and Windelspecht, 2016). Unfortunately for the affected individual, this adaptive response also fails, most likely due to the spirochete’s unique ability to traverse easily through deeper and more complex tissues due to its periplasmic flagellum and corkscrew structure before it can be effectively destroyed.

As the spirochete continues to thrive anywhere from 9 to 90 days, despite the innate and adaptive responses of the immune system, symptoms begin to manifest. This primarily results in the manifestation of a painless ulcer, a chancre, on the site of the infection that heals within three weeks. As the disease spreads throughout the body, a red rash occasionally appears on the patient’s skin in different places, often accompanied by sore throats and headaches. Once these symptoms continue for up to several years, the infection eventually develops into multiple painful skin lesions, or pustules on the genitalia of the sufferer, which, left alone can further develop forms of paralysis and neurological disorders (Peate, 1998). The manifestation of these symptoms on infected soldiers’ genitalia gave proof of the disease’s sexual (and often immoral) nature, which would go on to greatly affect how cases of the disease were treated. Societies viewed the contraction of syphilis as a divine punishment for sin, often leaving the afflicted to be shunned and punished with harsh treatments, rather than given appropriate, unprejudiced medical care, which furthered its spread across countries and into surrounding continents (Tampa et al., 2014).

Due to the prevalence of the deadly disease throughout the global community during the late 15th century, physicians were not able to ascertain the exact etiological origin of syphilis. Scientists have still not been able to confirm its etiological origin to this day. However, three main theories about its emergence exist: the Columbian hypothesis, the pre-Columbian hypothesis and the Unitarian hypothesis. The most popular of the theories, the Columbian theory claims that Christopher Columbus’ men contracted the disease from natives of the New World during their expedition and brought it back to the Old World after their return on March 15th, 1493 (Frith, 2012). Documents written by two Spanish physicians, Fernandez de Oviedo and Ruy Diaz de Isla, both confirmed this theory after observing the men upon their return. Due to radiocarbon dating technology in the 20th century, evidence was found that syphilis was present in the New World (and mostly absent in the Old World) prior to Columbus’ journey (Tampa et al., 2014). Since syphilis produces distinctive lesions on the skeleton (McElroy and Townsend, 2015), paleopathologists were able to find lesions on bone fragments from the New World that showed an age of several thousand years (Tampa et al., 2014).
In opposition to the Columbian hypothesis, the pre-Columbian theory was formed in the early 20th century and claims that syphilis had already been present in the Old World before Columbus’ expedition to the New World. Proposed by German medical historian Karl Sudhoff in 1912, it is possible that the syphilis epidemic of the 1490s was actually an epidemic of typhoid or paratyphoid fever. Others, such as acclaimed medical historian, Garrison (1913) who wrote the first comprehensive American publication on the history of medicine (An Introduction to the History of Medicine) have also supported this view, stating that ancient cases of syphilis were often misdiagnosed for leprosy, a disease that expressed symptoms similar to syphilis (particularly, skin lesions) in early stages. As a result of this difficulty in distinguishing syphilis from other diseases (such as dermatitis, herpes and other skin infections), physicians resorted to vaguely referring to the disease as the “great pox,” due to its smallpox-like appearance and widespread virulence (Frith, 2012).

Considered to be a close variant of the pre-Columbian theory, the Unitarian theory, proposed by Hudson (1928) suggests that both syphilis and its closely-related, non-venereal treponemal diseases (including yaws, pinta and bejel) are all different forms of the same infection with their forms depending on the contextual factors of its transmission (Frith, 2012; Hays, 1998). Hudson accredited the variations of *T. pallidum* to factors of “social, cultural and environmental changes” during the late 15th century that allowed for syphilis’ entrance into the global stage, primarily due to changing weather, social structures and personal hygiene habits (Frith, 2012). According to Hudson’s theory on syphilis: Yaws and bejel flourished as endemic childhood diseases in hot climates, among communities of little clothing and (in E. H. Hudson’s words) “low levels of personal and community hygiene”; when the organism reached urban populations in temperate climates it found its person-to-person routes (skin contacts) broken by clothing and more regular bathing habits and as such gradually evolved as an adult infection transmitted venereally (Hays, 1998).

This theory was countered by genetic studies that claim that the variants of *T. pallidum* are a result of genetic evolution, rather than mutated by certain contextual abiomic and biotic conditions surrounding the disease (Frith, 2012).

Before the term “syphilis” became its official identification from Girolamo Fracastoro’s epic Latin poem *Syphilis, sive morbus gallicus* published in 1530 about the 1490s epidemic (Frith, 2012), the venereal disease was given a variety of names, all of which were used by certain countries to attribute the disease to enemies or countries they believed to have caused the disease to spread. So, the inhabitants of today’s Italy, Germany and United Kingdom named syphilis ‘the French disease’, the French named it ‘the Neapolitan disease’, the Russians assigned the name of ‘Polish disease’, the Polish called it ‘the German disease’, the Danish, the Portuguese and the inhabitants of Northern Africa named it ‘the Spanish/Castilian disease’ and the Turks coined the term ‘Christian disease’.

Moreover, in Northern India, the Muslims blamed the Hindu for the outbreak of the affliction. However, the Hindu blamed the Muslims and in the end everyone blamed the Europeans (Tampa, 2014).

This trend of scapegoating the cause of syphilis contributes to the “stigmatized, disgraceful” perception of the disease that surrounds it still to this day (Tampa, 2014), due to the early implementation of structural violence, an issue of social injustice and inequality that underlies one of the main causes (if not the main cause) for syphilis’ increase in incidence over the past couple of decades and overall failure to be eradicated. The history of syphilis’ stigmatization altered the “course and outcome” of the disease and, therefore, the role of social determinants in the transmission and results of infectious diseases in general (Farmer et al., 2006).

**TRANSITIONING TREATMENT APPROACHES: EXTERNAL TO INTERNAL**

In order to analyze different responses to syphilis over the course of history, it is important to understand the two main approaches to treatment that were used. The initial approach began in the early sixteenth century and included various methods of purging the patient of the disease, in concordance with the widespread Galenic tradition of discharging certain humors of the body (blood, phlegm, yellow bile, or black bile) to achieve balance between them. Physicians utilizing this treatment sought results from the external body, with patients induced to sweat, Salivate, and/or excessively urinate or defecate. On the other hand, the second (and current) trend began in the late eighteenth century and included more attention to the microbes causing the disease, due to advances in the scientific revolution and experimentations (notably, Robert Koch’s experiments with anthrax in the late nineteenth century) that strengthened the germ theory on the contagious nature of disease (Walker et al., 2006). Physicians utilizing this concept of directly treating the antigens sought results from the internal body, with patients expected to regain wellness with the introduction of antibiotics to combat the causative bacterium, *T. pallidum*.

In other words, early treatment aimed to purge the patient’s entire body of a specific humoral element (in this case, phlegm) and induce the humor to manifest outside of the body (in the form of sweat and saliva, etc), while later treatment aimed to purge specific tissues and cells inside the patient of pathogenic microbes (in this case, *T. pallidum*).

Since Galenic theory maintained that the lesions present on syphilitics emerged as a result of humoral imbalance, many physicians in the early sixteenth century promoted...
an increase in sweating and salivating (removing excess phlegm) by prescribing two main treatments: guaiacum and mercury. Guaiacum is a type of wood found in the West Indies and Central and South America. The guaiac wood was ground into a powder that was then boiled in water and served to the patient as a potion for him or her to drink. The patient was then placed in a heated, sealed room to sweat out the potion and supposedly relieve the body of its overabundance in phlegm. The guaiac potion was most likely used due to the widely accepted “doctrine of specifics” which argued that “since God always paired diseases and remedies, an American disease must have an American remedy” (Hays, 1998: 66). It is now known that guaiac medicine could have only provided a psychological cure rather than a physical cure (Hays, 1998).

Once physicians began to grow dissatisfied with the ineffective results from guaiac medicine in relieving their patients’ symptoms, many introduced mercury to their practices (Frith, 2012). The use of mercury had long been favored by Arabian physicians, earning mercury the nickname “Arabic ointment.” Mercuric compounds were applied to the earliest “new” cases of the disease in the 1490s and were well used into the nineteenth century. When the ointment was rubbed on the lesions, the patient would eventually begin to produce immense quantities of saliva, which physicians saw as the purging of phlegm from the body (Hays, 1998). However, since the mercurial treatment was generally applied for years, patients developed iatrogenic disease from mercury poisoning, resulting in serious side effects including neuropathies, kidney failure and severe mouth ulcers often resulting in loss of teeth. Some eventually died from the treatment rather than the disease itself. These long, excruciating periods of treatment gave rise to the saying, “A night with Venus, and a lifetime with mercury” (Frith, 2012). One sexual encounter with a syphilitic gained an individual a lifetime of mercury and its detrimental side effects.

With the maturation of the scientific revolution in the eighteenth century, new discoveries in possible alternative remedies encouraged physicians to experiment with other treatment methods that lessened the use of deadly mercurial compounds. For example, English surgeon William Wallace (1791 to 1837) introduced iodine therapy, which contained potassium iodide with small doses of mercury. While these experimental treatments proved to be mostly ineffective, they still helped to promote other experimentations that would lead to increased interest in the causative organism of the disease and its contagious nature (Frith, 2012). With the help of Robert Koch’s work in creating guidelines (postulates) for proving the contagious nature of some diseases (the germ theory) in the late nineteenth century (Walker et al, 2006) and Fritz Richard Schaudinn and Erich Hoffmann’s discovery of the bacterium, Spirochaeta pallida (now known as T. pallidum) in 1905, the capability for scientists to examine microbial pathogenesis from a molecular point of view grew exponentially. Such developments shifted scientists’ focus away from the Galenic theory and towards the germ theory, where their focus remains to this day (Frith, 2012).

Due to the gradual acceptance of the germ theory, effective treatments began to emerge with the beginning of the twentieth century as micro-organisms were analyzed instead of humors. In 1906, German histological chemist Paul Ehrlich (who later founded the sciences of immunology and chemotherapy) and his assistant Sahachiro Hata, a Japanese bacteriologist, found success with the compound “dixo-diamino-arsenobenzol-dihydrochloride” (known as drug “606”) in treating syphilis in rabbits. This eventually led to the manufacture of arsphenamine (known as Salvarsan, or the “magic bullet”) in 1910 and neoarsphenamine (known as Neo-salvarsan, or drug “914”) in 1912. These arsenic treatments, however, had several issues including toxic side effects and complex administration due to the requirement of patients having many injections over a long period of time. Despite the problems with arsenic treatment, it still proved effective and continued to be prescribed for syphilis until the advent of penicillin (Frith, 2012).

Still prescribed as the main form of treatment for syphilis today, penicillin was discovered by accident in 1928 when mold grew inside a culture of Staphylococcus aureus that biologist Alexander Fleming had mistakenly left exposed near an open window. He found that the bacteria cells closest to the mold had died—penicillin, which originates from the Penicillium fungi, weakens the cell walls of dividing bacteria and causes them to burst and die due to osmotic pressure. This occurs since the dividing bacteria must temporarily create “holes” in its cell wall to allow for the growth and separation of two new resulting cells. The “holes” are then filled with freshly synthesized peptidoglycans. Penicillin kills bacteria by filling these holes with β-lactamase, inhibiting the β-lactam proteins that are supposed to connect peptidoglycans and therefore, close the “holes” in the cell wall. Leaving these holes open allows for the bacteria to fill up with water in the body and explode (Paddock, 2015). The newly-discovered penicillin was not used for the treatment of syphilis until John et al. (1943) exhibited its effectiveness while using intramuscular injections of a type of penicillin known as benzathine G to treat four patients with primary syphilis chancrens at the US Marine Hospital on Staten Island, all of whom did not suffer any significant side effects (Frith, 2012).

Although there have been no apparent developments of antibiotic resistance to or decline in effectiveness of intramuscular injections of benzathine G for treatment of the T. pallidum infection, there has been recent evidence of resistance in second-line macrolide penicillin treatments that were created to be taken orally instead of undergoing painful IM injections that could possibly result in severe allergic reactions. This form of penicillin is inconsistent with the CDC and UK treatment guidelines, since the
macrolides cause mutations in the 23S rRNA gene of various bacterial species, including *T. pallidum*, which results in the bacteria’s significant, high-level resistance to penicillin treatment. Despite these issues with the oral prescription for macrolide penicillin, benzathine penicillin, along with various prevention and treatment programs, continue to help prevent and alleviate cases of syphilis worldwide, working to finally turning a virulent epidemic disease into a more manageable episodic disease (Stamm, 2015).

However, due particularly to socio-cultural bias against certain high-risk populations (as opposed to antibiotic resistance), efforts to cure cases of syphilis with penicillin treatments and eventually eradicate the disease from the United States were limited and ultimately failed. Despite penicillin’s existence as a reliable, available treatment, the prejudice of the government and many healthcare officials withheld its availability from HIV-susceptible populations needing the treatment to combat HIV-syphilis co-infections that accounted for the recent rise in syphilis cases, a phenomenon that will be instrumental to analyses later.

**CHANGING RESPONSES: THE ISSUE OF “MORALITY”**

Due to the change in medical nature before and after the scientific revolution, physicians and scientists were able to gain more credibility from better access to advancements in technology and the establishments of practitioner qualifications and experimental guidelines that developed more thoroughly during the scientific revolution. These new establishments influenced physicians’ abilities to create more effective treatments as opposed to the past “rule of thumb” humoral remedies that were instated in concordance with Galenic theory (Hays, 1998). The shift in focus from humors to pathogenic micro-organisms (from external to internal) resulted in a more specific understanding of the cultural ideas associated with the treatment of the disease.

As treatments became more objective and efficient due to advances in scientific research, moral scrutiny became less of a hindrance for sufferers. For example, with syphilis, harsh treatments were often given to patients as punishment for engaging in “sinful” sexual activity with a syphilitic. After the scientific revolution, “moral” implications of the disease’s transmission to the patient were not considered at all towards the intensity (or “harshness”) of the treatment—information about transmission was only used to help diagnose and infer the necessary treatment of the disease, rather than the treatment of the individual’s morality (Frith, 2012).

Along with changes in medical understandings over time, it is also important to recognize how such change also influenced models of and for different cultural aspects surrounding the disease. The evolving treatment of syphilis provided a model for society by imparting prescriptive rules based around the idea of regulation. Just as a scientist closely monitors the cells involved with a disease in order to foster a cure, societies must regulate the factors that are involved with a disease within the community to lessen its incidence. For example, just as *T. pallidum* has been closely monitored during treatments with arsenic or penicillin instead of treated with harmful substances to purge supposed “phlegm,” so should governing bodies efficiently regulate prostitution in areas where syphilis is or could possibly become a significant issue (Hays, 1998).

Alongside this model, changing approaches to syphilis treatment provided a cultural model of society by presenting a descriptive depiction of the nature of society based around the idea of impartiality. Since objective treatments based on experiments and researched facts have yielded more effective, curative results than the previous, mostly subjective treatments based on “expert” (prior to the establishment of formal qualifications) and theological opinions, one can deduce the importance of objectivity in “curing” social conflicts. For example, just as penicillin was objectively prescribed to and efficient in successfully treating syphilitics (instead of harsh treatments due to the “imoral” means of the disease), objectivity must be used in deciding what is best for the general health of the public, rather than choosing to deny healthcare to specific groups (of different races and gender, etc) based on subjective grounds that hold no accurate or factual reasoning (Hays, 1998).

Aside from the theories encompassing it, syphilis itself is a very complicated disease, with its periods of latency, different stages and varying virulence and incidence over the course of history, all of which stiﬁed physicians when searching for an appropriate treatment to prescribe to sufferers. The complication of the disease is increased by the fact that the “great pox,” as it was called until the specific name “syphilis” was more generally employed by physicians in the early nineteenth century; it is very likely to have been the “broad brush” that has painted over a variety of diseases that might not have necessarily been syphilis (Frith, 2012). In other words, for hundreds of years, there were no writings or methods that made it possible for people to completely understand how to accurately recognize and specifically diagnose a *T. pallidum* infection. With this in mind, past treatments (pre-penicillin)—particularly humoral treatments in concordance to Galenic theory—were understandable attempts at alleviating a perceived pattern of symptoms, despite none of them appearing to be any more than psychologically curative.

Contemporary treatments, involving the continuous prescription of penicillin (still unimpeded by any sign of antibiotic resistance) and the ongoing education of preventative measures against the transmission of syphilis (including barrier contraceptives such as condoms), remain successful in reducing incidents of syphilis to this day (Stamm, 2015).
SOCIO-CULTURAL DISPARITIES: THE RESURGENCE OF SYPHILIS

Despite significant improvements in the development of procedures and technology in medical research that came about as a result of the scientific revolution, the incidence of syphilis infections has been increasing both in the global community and the United States. The estimated annual incidence of syphilis in the global community is around 12 million cases (Douglas, 2009), with the United States alone constituting 56,000 of these cases (CDC, 2015). After declining to a historic low in 1999 with a rate of 2.6 cases per 100,000 people (Wasserheit, 2000), an epidemiological transition in the identification of at-risk individuals occurred when the number of syphilis cases began to rise again—particularly in cases where transmission occurred through men who have sex with men, also known as “MSM” (CDC, 2015).

Increased cases of syphilis infections in MSM have also led to an increase in cases of human immunodeficiency virus (HIV) in MSM. Syphilis causes genital ulcers in the skin and mucous membranes that can easily bleed. When the ulcers come into contact with oral and rectal mucosa during sex, they can increase the infectiousness of and susceptibility to HIV 2- to 5-fold (CDC, 2015). Rates of HIV co-infection as high as 50 to 70% have been reported among MSM diagnosed as having primary and secondary syphilis (Clement et al., 2014), revealing the consistent “epidemiologic synergy” of the diseases. In other words, syphilis and HIV act synergistically to magnify the burden of disease in conjunction with the impact of societal inequality. This ongoing syndemic is due to the fact that MSM cases have been significantly overlooked in changing responses to the disease (Douglas, 2009).

As discussed in previous analysis of different responses to syphilis, past responses prior to the scientific revolution lack reliability in both governmental regulation and medical measures. To illustrate in the sixteenth century, European authorities attempted to control prostitution by issuing strict regulations for brothels and bathhouses in some areas, but their attempts failed due to a lack of regulation in enforcing the issued parameters. Also, medical treatments were unreliable due to their arbitrary nature, with often harsh treatments given to patients as punishment for engaging in “sinful” sexual activity with syphilis and their merely psychologically curative effects (Frith, 2012).

With the development of more consistent, reliable governmental regulation (of sex work) and medical measures following the scientific revolution, cases of syphilis began to decline significantly. Just as the establishment of practitioner qualifications and experimental guidelines were developed to increase the reliability and credibility of physicians and scientists, so were such qualifications and guidelines introduced to increase the reliability and credibility of government authorities (Hays, 1998). Now, with advances in the legal system and communication (enabled by the development of computers and mobile phones), law enforcement officers are able to more efficiently and consistently regulate the activities of sex workers, with the help of citizens’ reports of illegal sex work.

To further preventative measures against the transmission of syphilis and other sexually transmitted diseases that cannot be completely regulated by law enforcement, many non-governmental groups and organizations have also been established to provide prostitutes and other at-risk individuals with contraceptives such as condoms, which can help to provide a barrier to help prevent physical contact with genital ulcers (Weiner, 1996).

Although such organizations and institutions were successful in reducing cases of syphilis to a historic low in the United States during the late 1990s, they had failed to fully acknowledge a major demographic in syphilis’ incidence: MSM. This epidemiological transition came as a result of qualities inherent to the contemporary attitudes, economy and political system in the United States at that time. During the drop in syphilis cases in 1999, the United States Centers for Disease Control and Prevention launched a campaign that October to eradicate syphilis from the country by the year 2005 (Whittier et al., 2005).

However, the National Plan to eliminate syphilis fell through, not because of issues with the curative effects of penicillin treatment, but because of inequalities in socio-cultural factors surrounding the disease (Wasserheit, 2000). Therefore, populations of MSM continued to suffer—not because of a lack of available treatment, but because of the perpetuation of structural violence against them (Farmer et al., 2006): the cultural attitudes that stigmatized them, the economy that withheld access to quality care from them and the political system that isolated them from the national community.

Cultural attitudes towards sexuality caused disparities in those who are targeted by syphilis treatment and prevention programs. Prior to the 2000s, a racial disparity in care was recognized since syphilis was found to primarily occur among heterosexual men and women of racial and ethnic minority groups (CDC, 2015). For example, syphilis rates were 34-fold higher among blacks than whites in the United States, despite blacks only making up about 12% of the population (Wasserheit, 2000). As cases in minorities were eventually addressed and reduced, cases began to rise in MSM, accounting for 75% of all syphilis cases by 2013 (CDC, 2015). To bridge the disparity between heterosexual transmissions of syphilis and homosexual transmissions of syphilis, health officials and experts found ways to now reduce the incidence of syphilis in MSM. One of these ways involves influencing cultural attitudes through the media. Since broadcast media has been found by several studies to successfully change prevention attitudes and norms in the treatment of syphilis and other STDs, health officials have taken to television to...
promote syphilis screenings in MSM by embedding health promotion messages into the scripts of situation comedies, soap operas, and dramas (Whittier et al., 2005).

Along with disparities in cultural attitudes towards MSM, there are also significant economic inequalities with populations’ access to preventative and curative health services. Studies conducted in high-incidence areas found major economic discrepancies due to population-level factors, rather than in individual-level sexual behaviors. In other words, STDs are generally sustained in populations by “core groups” defined not only by high-risk sexual behaviors, but also by inadequate contact with the healthcare system—not being exposed to HIV prevention messages or condom distribution sites, informed about health insurance, or urged to seek care from public providers. For example: in the mid 1990s, the median ratio of public sector STD clinicians to patients with infectious syphilis in southern states with persistently high syphilis rates was less than one sixth of that in comparison states and limited access to quality STD care was repeatedly documented in high morbidity areas (Wasserheit, 2000).

Such imbalanced ratios in access to quality care significantly exist in MSM communities during the early 2000s (such as with the population of MSM in San Francisco, California) and the lack of adequate staffing at municipal STD clinics, educated community providers, screenings expanding into non-clinical settings, clinical sites for syphilis testing and sexual health organizations and programs (Klausner et al., 2005). In recent years, however, the public health sector expanded the focus of sexually transmitted disease prevention strategies to place greater emphasis on collaborating with key community leaders and organizations to promote health education (Wasserheit, 2000). For example, since many men in San Francisco had met their sex partners on the Internet, health officials worked with community leaders in the population to fund sexual health promotion advertisements and message boards on various gay sex partner websites (Klausner et al., 2005).

In correlation to health official’s involvement with collective populations instead of specific individuals, the United States political system instigated a fundamental conflict between individual rights to “privacy” and societal protection in the face of possible syphilis epidemics. In other words, there are issues in determining the state’s role in individual and/or collective healthcare. After the National Plan to eliminate syphilis dismantled in the 2000s due to the sudden rise in syphilis cases found to be syndemic with HIV, the federal government pushed for the “democratization of privacy,” or, in other words, public health surveillance over a population.

To make this democratization of privacy possible, HIV/AIDS case reporting became an epidemiological necessity at state and local levels. Affected communities resisted the registration of case by name, since it would exclude the communities from the country and diminish respect for them. As one advocate against name-based reporting stated:

The threat to our fundamental human rights posed by the existence of AIDS is an evil of equal strength to the disease itself. To ignore our feelings will only alienate the gay community thereby impeding [the health department’s] often legitimate efforts to arrest this serious health problem.

In order for syphilis and HIV prevention efforts to be successful, patient advocacy and patient preferences were (and are) needed for the success of public health (Buffie, 2011).

Due to President Barack Obama’s recent legalization of same-sex marriage on June 26th, 2015, these syphilis prevention efforts may finally lead to a successful eradication effort. Now that same-sex marriages are deemed equal to all marriages in the eyes of the law, MSM couples have better access to health insurance benefits and private healthcare, rather than “democratic” public care. The social and legal recognition of same-sex marriages also greatly increases the likelihood of commitment in a same-sex relationship (movement from cohabitation to legal marriage) (Stevens et al., 2006), which in turn greatly decreases the likelihood of syphilis transmission due to the maintenance of a monogamous relationship (CDC, 2015). Moreover, and perhaps most importantly for the societal treatment of syphilis and other STDs, the legalization of same-sex marriage provides a platform for the separation of church and state, of what is “moral” and what is constitutional. If diseases that are transmitted sexually cease to be stigmatized by way of contemporary attitudes, economic factors, and the political system due to their “immoral” nature, syphilis (and other STDs) will no longer cease to be eliminated from the United States and, possibly, the world (Stevens et al., 2006).

IMPROVING TREATMENT PRACTICE: ERADICATION OF STRUCTURAL VIOLENCE

With that said, the best practice for treating syphilis relies strictly on the regulation of populations’ access to quality care and not the judgment of diseases’ “morality” in public policy, clinical resources and education. State and local governments must continue to regulate prostitution and other forms of sex work, as well as, work with leaders in high-risk communities to provide individual care without infringing on the privacy of individuals’ medical needs (Wasserheit, 2000), which will work to ensure better cooperation with the public in participating in public health (Buffie, 2011).

Practitioners of medicine and public health must also work to make common cause with community leaders who can provide structural interventions more proximally. This also applies to other public health crises, such as other STDs and stigmatized diseases, where social prejudice
against at-risk populations has inhibited the availability and effectiveness of care. For example, during the AIDS pandemic, much of the prevention and care of AIDS was owed to bold, specific campaigns led by clinicians and community leaders that triggered a “virtuous social cycle” by promoting the “public good” and promising to shift the burden of pathology away from children and young adults, a major victory in the struggle to lessen structural violence in AIDS treatment (Farmer et al., 2006).

As for resources of quality, individual care and physicians providing public care (especially in high-risk areas) must be better trained in asking uncomfortable sexual health history questions in order to correctly identify syphilis in a patient. Since syphilis can appear similar to dermatitis, acne and herpes, it is not uncommon for easily treatable cases of syphilis to develop into later stages and risk further transmission due to a misdiagnosis, if certain information about the infection’s history is not discovered. The CDC’s “Guide to Taking a Sexual History” is a resource that physicians may use to facilitate the process of diagnosis (Klein et al., 2015). A single intramuscular injection of long acting Benzathine penicillin G will easily cure earlier stages of syphilis, but, if the infection is misdiagnosed, it may develop into latent syphilis, which is much more difficult to treat (CDC, 2015). Thankfully, however, the causative bacterium, *T. pallidum*, remains highly sensitive to penicillin and shows no signs of antibiotic resistance (Stamm, 2015).

In order to prevent future epidemics of syphilis and other STDs, the public must engage in organizing treatment and prevention programs—namely, sex education. Not only should students and communities be taught the correct and consistent use of condoms to help protect against possible STD transmission, but they should also be informed on the correlation of syphilis and HIV—how having syphilis can make an individual much more susceptible to contracting an HIV infection (CDC, 2015).

Prior to the epidemiological shift in the incidence of syphilis in the late 1990s (with the increase due to MSM), sex information was specifically tailored to heterosexual intercourse. It is important that now, especially due to the legalization of same-sex marriage, that this information is also (if not especially) tailored to include homosexual situations as well.

To reinforce ideas of preventing STDs and having routine screenings outside of sex education, the media must also make an effort to introduce such situations in the scripts of television and online shows (Whittier et al., 2005). Through efforts of public health officials, sex educators and television show writers, prevention will be more successful and clinical treatment better understood and sought out.

**CONCLUSIONS**

Syphilis historically has and currently continues to present challenges to global public health, particularly because it can increase the risk of acquiring and transmitting HIV infection. However, penicillin, which was first used for treatment of syphilis in the 1940s, has remained the recommended first-line drug for treatment of all stages of syphilis. Unlike most other bacteria, *T. pallidum* has remained highly sensitive to penicillin.

Although the emergence of penicillin resistance appears unlikely since it would possibly require multi-step mutational changes in the bacterium, *T. pallidum* still has a capacity for endogenous genetic change, which was demonstrated by the emergence of clinically significant, high-level macrolide resistance due to point mutations in its 23S rRNA genes. Therefore, it is reasonable to surmise from *T. pallidum*’s resistance to oral antibiotic macrolide treatment that the bacterium may also become resistant to IM injections of antibiotic benzathine treatment (Stamm, 2015), which presents a greater sense of urgency to the need for syphilis to decrease in incidence once again for the possible implementation of a second eradication effort.

In order for such a substantial effort to be successful (at least in the United States), people must understand that the morbidity and mortality of epidemic diseases are tightly linked to socio-cultural conditions. If structural violence presented in the contemporary socio-cultural factors of societal attitudes, economic accessibilities and the political system is addressed by “resocializing” understandings of disease distribution and outcome (Farmer et al., 2006) and altered through the aforementioned methods for attaining the best plan for treating syphilis, it is likely that syphilis may no longer present as urgent a concern to epidemiologists.

It is imperative to remember, however, that subjective judgments in morality must be discredited and, instead, objective and quality care be provided for better access by high-risk communities.

Syphilis has the potential to be eliminated from the United States—we have the treatments, the people and the motivation to do it—we just need to learn to reach across socio-cultural barriers of inequality and inaccessibility, particularly in communities of MSM, to make the eradication of syphilis in our country a reality.

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