

The Social Impact of the Misconceptions Surrounding Tuberculosis

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In 1680, an English writer named John Bunyan described tuberculosis as “the captain of all these men of death,” as he believed tuberculosis was the deadliest of common diseases.¹ This, indeed, is an appropriate description of tuberculosis, a disease that is estimated to have caused more deaths than any other microbial pathogen in world history.² This paper will focus on tuberculosis in the Western world. For much of its history, tuberculosis was not understood; people put forth various theories addressing questions such as what caused it, how it spread, and who was most likely to get it, among others. This paper will then address many of the misconceptions surrounding tuberculosis in three different time periods: ancient times, the Middle Ages, and the 19th-20th centuries. In ancient times, the lack of understanding of tuberculosis resulted in the discrimination and isolation of the sick. In the Middle Ages, kings used tuberculosis to secure political power over their subjects. In the 19th and 20th centuries tuberculosis was both romanticized and feared, depending on the region of the Western world. Stereotypes were formed around victims of tuberculosis as society tried to make sense of a disease they did not understand. This paper will discuss how different

¹ Linda Bryder, *Below the Magic Mountain: A Social History of Tuberculosis in Twentieth-Century Britain* (New York: Oxford University Press, 1988), 16.

² John Frith, “History of Tuberculosis. Part 1 – Phthisis, Consumption, and the White Plague,” *Journal of Military and Veterans’ Health*, vol. 22, issue 2, (2014), 29.

assumptions about tuberculosis shaped society's view of the disease and its victims.

Tuberculosis is caused by the bacteria *Mycobacterium tuberculosis*. While the bacteria most commonly attacks the lungs in a form known as pulmonary tuberculosis, it has been known to attack other organs as well by moving through the bloodstream. Tuberculosis is a very contagious disease and is transmitted through the air.³ However, exposure and infection do not necessarily mean one will develop tuberculosis. Currently over two billion people are infected with tuberculosis, but only 10% will go on to develop tuberculosis.⁴ The remaining 90% have a form called latent tuberculosis and will experience no symptoms. However, if the immune system is compromised, latent tuberculosis can easily morph into a case of active tuberculosis. If left untreated, tuberculosis can become a chronic condition and easily turn deadly. Tuberculosis has been known to affect young adults in particular. Common symptoms include coughing, fever, wasting, and hemoptysis (coughing up blood). While common symptoms have remained the same throughout history the name of the disease has changed. The ancient Greeks referred to the disease as phthisis, which translated to a wasting disease. This posed problems for diagnoses; Hippocrates believed that every disease that caused emaciation was phthisis.⁵ This misconception clearly demonstrated the lack of a complete understanding of tuberculosis at the time. In the Hebrew Bible, the word “schachepeth” was used; the ancient Hebrew word also translated to mean a wasting disease. In the current Hebrew language, the derived word of “schachefet” is the word for tuberculosis.⁶ In the Middle Ages, a non-pulmonary form of tuberculosis became prevalent; this was known as scrofula, which was derived from the Latin word “scrofa,” meaning “sow.” This form of tuberculosis infected the lymph nodes, causing the neck to swell, which people thought resembled the neck of a sow.⁷ Consumption was perhaps the most used term for tuberculosis in the Western world up until the

³ U.S National Library of Medicine, “Tuberculosis,” *MedlinePlus*, 1 October 2016, accessed 9 October 2016, <https://medlineplus.gov/tuberculosis.html>.

⁴ Carol Dyer, *Biographies of Disease: Tuberculosis* (Santa Barbara: Greenwood, 2010), 5.

⁵ Selman A. Waksman, *The Conquest of Tuberculosis* (Berkeley and Los Angeles: University of California Press, 1964), 1.

⁶ Virginia S. Daniel and Thomas M. Daniel, “Old Testament Biblical References to Tuberculosis,” *Clinical Infectious Diseases*, vol. 29, issue 6 (1999), 1557.

⁷ Susan Wheeler, “Medicine in Art: Henry IV of France Touching for Scrofula, by Pierre Firens,” *Journal of the History of Medicine and Allied Sciences*, vol. 58, issue 1 (2003), 79.

end of the 20th century. It was known as consumption because the disease appeared to consume its victim, causing extreme weight loss. Another common name was the White Plague, due to the pallor of tuberculosis victims. When Robert Koch discovered the bacteria that caused the disease, *Mycobacterium tuberculosis*, in 1882, it became commonly known as tuberculosis.

Ancient Times

Tuberculosis has been around for thousands of years and has affected a countless number of cultures and civilizations. Archaeological digs have unearthed skeletons dating back to the Neolithic Age that exhibit signs of tuberculosis. The disease was familiar to many ancient peoples, which can be seen through their texts, and feared by all who encountered it. Tuberculosis was described as early as Babylonian times (circa 1900 BC), where its symptoms were inscribed on tablets and relics.⁸ The Code of Hammurabi, a Babylonian law code dating back to 1754 BC, describes a lung disease that was most likely tuberculosis.⁹ Tuberculosis is also mentioned twice in the Bible. In Leviticus 26:16, God warns the people of Israel, saying, “I will bring terror upon you—with consumption and fever to dim the eyes and sap the life.” Consumption was considered a punishment by God, brought upon those who performed sinful deeds.

The Greeks were more than familiar with consumption, or phthisis as it was known. As Hippocrates wrote, “Phthisis was really the most prevalent of the diseases which prevailed at that time and the only one which killed the patients.”¹⁰ *Aphorisms* of Hippocrates described the Greek knowledge of phthisis. He noted that phthisis typically manifested itself between the ages of eighteen and thirty-five years and described the “expectoration of a spumous blood” as a common symptom.¹¹ The Greeks were the first people to thoroughly describe phthisis.

In Europe, the Greeks were at the forefront of medicine during ancient times and, in addition to describing the disease, set the precedent for treatment. They were the first society in the Western world to propose methods of

⁸ Waksman, *The Conquest of Tuberculosis*, 8-9.

⁹ Dyer, *Biographies of Disease*, 30.

¹⁰ Waksman, *The Conquest of Tuberculosis*, 9.

¹¹ Hippocrates, *Aphorisms of Hippocrates*, trans. by Elias Marks (New York City: Collins & Co., 1817), 101.

treatment. The sick were sent to temples in warm climates to be healed.¹² The Greek philosopher Celsus believed sending the sick away on long sea voyages was advantageous to health.¹³ The discovery of bacteria had yet to occur, so the true cause of phthisis was not known at this time. The Greeks put forth various theories on how phthisis operated. The Greek physician Aretæus suggested that certain people were more vulnerable to phthisis than others; the more susceptible were thought to be pale and slender in build.¹⁴ Hippocrates concluded that phthisis was hereditary by observing the occurrence of phthisis in entire families. On the other end of the spectrum, Greek physician Galen rejected the idea of heredity in favor of an idea that resembled contagion. Galen believed the cough of the sick poisoned the air and recommended avoiding the sick individual; while his proposition hinted at contagion, he did not go so far as to propose a theory of contagion.¹⁵ He suggested treatment occur at high altitudes with plenty of fresh air.

With increased awareness of the disease came social discrimination. Hippocrates warned physicians to avoid advanced cases of phthisis. Death was known to be almost inevitable in the late stages of phthisis as no definite cure for the deadly disease had been found, and the deaths of patients could be detrimental to a physician's reputation because it demonstrated his inability to cure his patients.¹⁶ Greek physicians selected which patients would receive treatment based on how advanced their case of phthisis was, avoiding cases that would result in death in order to protect their reputation. The more advanced a victim's case was, the less likely they were to receive treatment. This resulted in a form of discrimination that left some with no treatment and no hope of survival (although whether treatment was effective is unlikely).

Not all phthisis patients were rejected by physicians. Some were sent away to temples or on sea voyages to be cured. While temples and sea voyages were used as forms of treatment, they were more importantly a way to isolate the sick from the rest of the population. There were two reasons for this isolation. Some, like Galen, believed that disease could be transmitted through the air

¹² Waksman, *The Conquest of Tuberculosis*, 8.

¹³ David Jacob Aaron Chowry-Muthu, *Pulmonary Tuberculosis and Sanatorium Treatment: A Record of Ten Years of Observation and Work in Open-Air Sanatorium* (London: Baillière, Tindall and Cox, 1910), 82.

¹⁴ Aretæus, *De Causis et Signis Acutorum Morborum*, trans. by Francis Adams, 1972.

¹⁵ Jared J. Eddy, "The Ancient City of Rome, Its Empire, and the Spread of Tuberculosis in Europe," *Tuberculosis*, issue 95 (2015), S25.

¹⁶ Dyer, *Biographies of Disease*, 31.

and that separating the sick from the healthy would prevent others from getting sick; this was the more accurate reasoning.¹⁷ Most Greeks, however, believed that the sick were being punished by angry gods; this led to the fear of association with the condemned.¹⁸ Association could lead to the gods damning the healthy individuals as well, causing misfortune, possibly even illness, to befall them. In addition, ancient Greece was in constant war and needed healthy soldiers to fight; the diseased were seen as useless in this respect as they were unfit to fight as soldiers.¹⁹ Women who had fallen ill were also viewed as useless by the community, as phthisis prevented them from performing their main duty of maintaining the household.

Although the Romans were well known admirers of the Greeks, they did not view being a physician as a true profession. Instead they left the practice of medicine to the Greeks. The Romans believed that the household was responsible for preventing illness. It was thought that if the head of the household properly thanked the gods, no illness would befall the members within the home.²⁰ Historians have found that Roman physicians experienced lower social statuses compared to their counterparts in Greece, as they were viewed as less important. As a result, there was little motivation for Romans to become physicians. Large households often would have a slave physician, showing just how lowly a physician's social status could be.²¹ Consequently, the Romans did little to progress the knowledge or treatment of phthisis; however, they did introduce the hospital system, which would become crucial to the treatment of tuberculosis, as well as a multitude of other ailments.²²

Tuberculosis was widespread in the ancient Mediterranean world. In 476, with the fall of the Roman Empire and the invasions of Germanic tribes into Roman territory, people began to move out of cities and establish rural, isolated settlements. The lack of transportation and interaction led to a decrease in the

¹⁷ James Longrigg, "Death and Epidemic Disease in Classical Athens," in *Death and Disease in the Ancient City*, ed. by Valerie M. Hope and Eireann Marshall (London: Routledge, 2002), 57.

¹⁸ Celsus, *De Medicina*, trans. by F. Marx (Leipzig: B. G. Teubner, 1915).

¹⁹ Angela Cushing, "Illness and Health in the Ancient World," *Collegian*, vol. 5, issue 3 (1998), 44.

²⁰ J. N. Hays, *The Burdens of Disease: Epidemics and Human Response in Western History* (New Brunswick: Rutgers University Press, 2009), 13.

²¹ R. W. Davies, "Medicine in Ancient Rome," *History Today*, vol. 21, issue 11 (1977), 771.

²² *Ibid.*, 7.

prevalence of the disease.²³ However, in the late Middle Ages, there was an increase in migration back into urban areas, and with that, tuberculosis once again reared its ugly head.

Middle Ages

Despite the passing of time, the understanding of tuberculosis—along with disease in general—was limited. In medieval Europe, scrofula, or tuberculosis cervical lymphadenitis, became a prevalent form of the disease among the poor. This form caused large masses on the face and neck area.²⁴ Christians throughout history believed disease to be a supernatural force. In France and England, the prevailing belief of the time was that scrofula had been caused by their sins and that only a divine king's touch could cure their illness. The poor were the most common social class to receive a king's touch, as they were the most likely to fall ill with scrofula. However, the practice was open to members of every social class.²⁵ King's Touch is thought to have begun with Frankish king Robert the Pious in the 11th century. The act peaked with King Charles II of England in the 17th century, who touched over 100,000 victims.²⁶ The idea of King's Touch was reinforced because scrofula tended to be nonfatal; after a king's touch a patient would go into remission naturally, believing that they had been "cured."²⁷ However, it was typical for the disease to reappear even after one had been seemingly "cured." Many would have to return to the king, only to be touched and "cured" again.²⁸ Despite the fact that people repeatedly contracted scrofula, the disappearance of their illness after a touch only further convinced them that the king had cured them.

The claim to healing powers had a tremendous impact on the political system of the time. It essentially legitimized a king's entitlement to the throne. By "curing" victims, the king could claim that God had blessed him and had chosen him to rule. It is important to note that Christianity was practiced differently during the Middle Ages than it is today. In Medieval Europe, Christians were fearful of God, as he was portrayed not as merciful but as a

²³ Waksman, *The Conquest of Tuberculosis*, 19.

²⁴ Fleta N. Bray et al., "Scrofula and the Divine Right of Royalty: The King's Touch," *JAMA Dermatology*, vol. 149, issue 1 (2015), 702.

²⁵ *Ibid.*, 702.

²⁶ *Ibid.*, 702.

²⁷ Hays, *The Burdens of Disease*, 31.

²⁸ Wheeler, "Medicine in Art," 79.

vengeful figure who must be pleased. A hierarchy existed where God was the all-powerful sovereign and mankind was subordinate. Initially, claims to lordship held little meaning to Christians, as they saw themselves subject to the rule of God, not to the rule of kings and lords. Those who wished to rule knew the only way to have their subjects become loyal was to declare that they were selected by God to rule. While divine right was not a new idea, it meant little to early Christians. When Roman emperors and pagan kings declared to be divinely appointed, Christians essentially ignored their claims, as their god was different from their ruler's god.²⁹ However, when Christian kings claimed divine right, Christians believed them. The King's Touch simply reinforced the belief that kings were selected by God. Christians, fearing God's wrath, subjected themselves to the king's authority. This proved to be particularly effective for kings who usurped the throne and wanted to start a new dynasty. The ability to "cure" their subjects from scrofula secured their claim to the throne, as it proved to their subjects that they were chosen by God to be the new king.³⁰ It was a political move that proved effective for centuries.

By the 18th century, the idea of divine and supernatural healing was no longer a widespread belief.³¹ The practice began dying out as movements, such as the scientific revolution and the Enlightenment, began to gain momentum. The last recorded instance of King's Touch occurred in 1825, when King Charles X touched a tuberculosis patient for the last time.³²

Over the preceding few centuries different beliefs surrounding disease emerged. One belief that became widely accepted in the medical community was contagion. Contagion during this time was the understanding that disease could spread through close contact between individuals. Although the first emphasis of the contagious nature of tuberculosis can be found in Girolamo Fracastoro's *De Morbis Contagiosis*, which was written in 1546, it was not until the 18th century that the medical world became more accepting of the idea of contagion.³³ 18th century physician Giovanni Battista Morgagni once told a student, "Young man, keep away from the dead bodies of consumptives, I,

²⁹ Tiberiu Brăilean and Aurelian-Petruș Plopeanu, "Christianity and Political Democracy in the Middle Ages and Modern Times," *Human and Social Studies*, vol. 2, issue 2 (2013), 124.

³⁰ Hays, *The Burdens of Disease*, 32.

³¹ Hays, *The Burdens of Disease*, 33.

³² Brays et al., "Scrofula and the Divine Right of Royalty," 702.

³³ Waksman, *The Conquest of Tuberculosis*, 50.

even as an old man, keep away from them.”³⁴ Morgagni eventually refused to perform any more autopsies on victims of tuberculosis out of fear of the communicability of the disease. Although the science behind contagion had yet to be explained, the conviction of the contagious nature of tuberculosis had grown stronger.³⁵

Laws regarding tuberculosis were put forth by governments across Western Europe to battle the disease and prevent contagion. In 18th century Italy, laws stated that tuberculosis had to be reported to authorities and the belongings of the sick had to be burned. If a physician failed to report a sick patient, the first punishment was a fine of 300 ducat; if a second offense was committed, the penalty was banishment for ten years.³⁶ The severity of punishments showed how fearful the Italian government was of the possible contagious nature of tuberculosis. In 14th century Poland, the sick were ostracized by society and their property was burned to the ground. By the 18th century laws in regard to tuberculosis were put in place in Poland; these laws required tuberculosis cases to be reported to authorities. Consumptives were subsequently forced by authorities into isolation and their property was burned.³⁷

Despite the fact that Western European and American physicians suspected tuberculosis to be contagious and that governments treated it like it was, the overriding belief of the public was that the disease was hereditary.³⁸ Outside of the medical world, people were convinced that tuberculosis was much more likely to be found in families who had a history of the disease; even if only one member of a family had contracted tuberculosis, it was thought that tuberculosis ran in the family and that all members were vulnerable to the disease. Contagion was poorly understood during this time period and, therefore, had trouble finding footing in the nonmedical world. The idea of heredity was much easier for people to understand and, thanks to Hippocrates, the notion that tuberculosis was hereditary had already been around for thousands of years.

³⁴ Ibid., 55.

³⁵ Ibid., 54.

³⁶ Waksman, *The Conquest of Tuberculosis*, 51–53.

³⁷ Charlotte A. Roberts and Jane E. Buikstra, *The Bioarchaeology of Tuberculosis: A Global View on a Reemerging Disease* (Gainesville: University Press of Florida, 2003), 158–159.

³⁸ Dyer, *Biographies of Disease*, 35.

19th and 20th Centuries

By the 19th century, there was still no common understanding of tuberculosis. This allowed for a romanticized view of the disease. People of the Western world found beauty in the appearance associated with consumptives—pale pallor, slenderness, sparkling eyes, and rosy cheeks were considered desirable traits of any fashionable person in the first half of the 19th century. Paleness and thinness were caused by the severe weight loss brought about by tuberculosis, while a rosy complexion and sparkling eyes resulted from fever. However, these traits represented Western society's ideals of beauty, particularly feminine beauty. This idea was reinforced by the fact that young women were much more likely to be consumptive than older women, as the disease was known to mainly target young adults.³⁹ Women of the time would even go so far as to wear makeup in a fashion that resembled the appearance of a consumptive. The French writer Alexandre Dumas, fils once wrote, "It was the fashion to suffer from the lungs; everybody was consumptive, poets especially; it was good form to spit blood after any emotion that was at all sensational, and to die before reaching the age thirty."⁴⁰

Not only was tuberculosis associated with beauty, it also was connected to artistic genius. Ill patients sometimes experienced a burst of optimism and euphoria (even in the later stages of tuberculosis) known as *spes phthisica*. *Spes phthisica* was described as early as the 16th century. For a while it was thought to have caused tuberculosis; other mental states also were assumed to induce tuberculosis, such as hypochondriasis and hysteria.⁴¹ Once Robert Koch discovered *Mycobacterium tuberculosis*, it was believed that toxins emitted by the bacteria brought about the effect, while also causing other diseases, such as hysteria.⁴² However, the consensus was that *spes phthisica* was a psychological condition where the unwillingness of the victim to accept the gravity of their circumstances led to uncharacteristic optimism.⁴³ *Spes phthisica* has been credited for bouts of creativity from tuberculosis patients. Many great artists of the time suffered from tuberculosis: Percy Bysshe Shelley, Sir Walter Scott,

³⁹ David M. Morris, "At the Deathbed of Consumptive Art," *Emerging Infectious Diseases*, vol. 6, issue 11 (2002), 1354.

⁴⁰ *Ibid.*, 1354.

⁴¹ Waksman, *The Conquest of Tuberculosis*, 29.

⁴² Joseph Hollós, "Tuberculous Intoxications: Concealed and Masked Tuberculosis," *Journal of the American Medical Association*, vol. 93, issue 10 (1929), 792.

⁴³ B. Meyer, "Til Death Do Us Part: The Consumptive Victorian Heroine in Popular Romantic Fiction," *Journal of Popular Culture*, vol. 37, issue 2 (2003), 290.

Edgar Allen Poe, Henry David Thoreau, Frédéric Chopin, and many more.⁴⁴ John Keats was a medical student prior to becoming a poet; while sick with tuberculosis, he wrote his best-known poems.⁴⁵ Almost the entire Brontë family was wiped out from tuberculosis; all six children (Maria, Elizabeth, Emily, Anne, Charlotte (debatable), and Branwell) died from the disease.⁴⁶ All of the Brontë children were known for being poets, writers, or artists. Tuberculosis was seen as almost a necessity to becoming an artist; as Dumas said, it was, indeed, fashionable to be consumptive during the first half of the 19th century.

Not only was creative genius attributed to tuberculosis, tuberculosis also inspired art. *La Dame aux Camélias* by Alexandre Dumas, fils inspired Giuseppe Verdi's *La traviata*, which was an opera about a woman with tuberculosis. The main character, Violetta, lives a sinful life. She is diagnosed with consumption and finally achieves redemption through her death.⁴⁷ This is just an example of how tuberculosis was romanticized in the first half of the 19th century; it was considered able to save people from their sins. Only when Violetta succumbs to her disease is she worthy of praise from her family. The opera made dying from tuberculosis appear to be a noble cause, instead of an unfortunate death by illness.

While some romanticized tuberculosis, others feared the disease. By 1800 in the New England area of the United States, twenty-five percent of deaths were caused by tuberculosis.⁴⁸ Throughout New England, rumors of vampires causing tuberculosis spread. After the death of a tuberculosis victim, the family of the deceased would often start expressing symptoms of the disease as well. Friends and neighbors accused the deceased of being a vampire who was sucking the life out of his family, which was why they were exhibiting signs of illness.⁴⁹

⁴⁴ Bryder, *Below the Magic Mountain*, 199.

⁴⁵ Morris, "At the Deathbed," 1354.

⁴⁶ Maureen Corrigan, "In 'The Brontës,' Details of a Family's Strange World," review of *The Brontës: Wild Genius on the Moors*, by Juliet Barker, *National Public Radio*, 27 August 2012, Book Reviews.

⁴⁷ Morris, "At the Deathbed," 1354–1355.

⁴⁸ Michael E. Bell, "Vampires and Death in New England, 1784 to 1892," *Anthropology and Humanism*, vol. 31, issue 2 (2006), 124.

⁴⁹ Paul S. Sledzik and Nicholas Bellantoni, "Brief Communication: Bioarcheological and Bioculture Evidence for the New England Vampire Folk Belief," *American Journal of Physical Anthropology*, vol. 94, issue 2 (1994), 270.

The best-known case of “vampirism” in the United States occurred in 1892 in the small town of Exeter, Rhode Island. By the time George Brown’s son Edwin fell ill with tuberculosis, three members of the family had already died of the disease. While George Brown was skeptical about vampires causing his son’s illness, his neighbors had no doubt. Neighbors called for the death of the vampire, and rising pressure forced Brown to exhume the bodies of his deceased family members and burn the heart of his daughter. The ashes were fed to Edwin, who died soon after.⁵⁰ Brown’s story showed that while not all New Englanders believed in vampires, peer pressure forced many to partake in the vampire furor.

Most of the behavior in response to vampirism occurred prior to Koch’s discovery of the tuberculosis bacteria. Around the second half of the 19th century, germ theory and contagion had gained acceptance by the public. However, the vampire belief persisted in rural areas. The rural towns of New England tended to be fairly isolated and education was not available for all. This prevented scientific ideas, such as contagion, from reaching the people of the New England area. It also allowed for superstitious beliefs and folklore to continue even after the discovery of the tubercle bacillus.⁵¹

People fear what they cannot see, and fear was a large contributor to the vampire panic of the area. Prior to the discovery of tuberculosis’s cause, people were frantic to find something to attribute the disease to. They were even more desperate for a cure. The people of New England decided that it was better to exhume, burn, and sometimes even eat the bodies of vampires rather than watch their loved ones die.⁵² Even after Koch’s discovery in 1882, there was still no cure for tuberculosis, which allowed the vampire myth to persist. Throughout history, untimely deaths have been seen as unnatural, and people of many cultures have feared the return of the dead to haunt the living.⁵³ This tied the untimely deaths caused by tuberculosis to vampires in the minds of New Englanders. In addition, the symptoms of the disease were also linked to vampirism. Consumptives suffered more at night, resulting in them being awake at night. They also had a pale, deathlike pallor and sometimes blood in

⁵⁰ Stanley M. Aronson, “An Alien Legend with a Bite,” *Rhode Island Medical Journal*, vol. 91, issue 6 (2008), 159.

⁵¹ Bell, “Vampires and Death,” 137.

⁵² *Ibid.*, 124.

⁵³ *Ibid.*, 131.

their mouths (caused by hemoptysis).⁵⁴ Fear and folklore had driven the people of New England to conclude vampires were responsible for their suffering. As hysteria has been known to do, it brought out irrational behaviors in New England that seem almost backwards given the time period. In 1892, the *Providence Journal* referred to the Browns' story as evidence that "civilization" was being threatened by "survivals of primitive thought."⁵⁵ Upon reading of a family who burned a "vampire," Henry David Thoreau wrote, "The savage in man is never quite eradicated."⁵⁶ While their actions were deemed "primitive" by the rest of the Western world, the people of New England felt as if they had no choice but to burn the bodies of the deceased, as no other cure had been discovered. Fearing for their lives, some New Englanders were willing to do whatever it took to survive.

While some rural populations were afraid of the supernatural causing tuberculosis, the rest of the Western world was afraid of the contagious nature of tuberculosis. "Tuberculophobia" had gripped the world as contagion became widespread knowledge. This fear was taken advantage of and soon patent medicines for tuberculosis were being produced by small family operations. These nostrums claimed all sort of health benefits and cures, despite being ineffective. Advertising companies latched on to these products, using the public's fear of tuberculosis to create profit. They began advertising products that claimed to prevent—even cure—tuberculosis. These kinds of products were numerous. The Ozone Anti-Germ Inhaler claimed to be able to cure "incipient consumption."⁵⁷ Dr. De Jongh's Cod Liver Oil was advertised as the "safest, speediest, and most effectual remedy for consumption."⁵⁸ People willingly spent money on products that falsely claimed to be a tuberculosis "cure." Fear of tuberculosis caused people to purchase anything that might save them from the disease. In a way, this was similar to the vampire panic that gripped New England. In both cases, people were so afraid of tuberculosis they were willing to do whatever it took to stop the disease,

⁵⁴ *Ibid.*, 133.

⁵⁵ Bell, "Vampires and Death," 137.

⁵⁶ Henry David Thoreau, "September 26th, 1859," *Journal* 15: 1859–1860, http://thoreau.library.ucsb.edu/writings_journals_pdfs/J15f4-f6.pdf

⁵⁷ Loring & Company, "Ozone Anti-Germ Inhaler" (advertisement), *The American School Board Journal*, vol. 17, issue 5 (1898), 27.

⁵⁸ Ansar, Harford & Company, "Dr. De Jongh's Light Brown Cod Liver Oil" (advertisement), *Cornhill Magazine*, issue 36 (1864), 265.

whether that was by burning vampires or buying whatever new “cure” was being advertised at the time.

Fear also led to laws being passed in order to prevent the tuberculosis bacteria from spreading. While milk was prescribed by Hippocrates through 19th century doctors, the turn of the 20th century saw the introduction of pasteurization in the United States, as it was recognized that bovine tuberculosis was harmful to humans.⁵⁹ At the beginning of the 20th century, it was estimated that 10% of tuberculosis cases in the U.S. were caused by bovine tuberculosis from the milk of cows. This created a call by the Food and Drug Administration, a federal health agency formed in 1906, for the pasteurization of milk in order to eliminate tuberculosis bacteria from milk.⁶⁰ Whereas in 1900 almost no milk was pasteurized, by 1936, approximately 98% of commercial milk sold in the United States was pasteurized.⁶¹ Other laws attempted to combat tuberculosis. Colorado legislatures proposed a bill that would require “lungers” (those with tuberculosis) to wear bells around their neck in order to warn people they were consumptive.⁶² The most common laws across the United States prohibited spitting. Spitting was a common practice in the United States among all social classes; chewing tobacco was popular and spittoons could be found in homes and public buildings everywhere.⁶³ However, public health concerns prevailed over the cultural norm and soon cities were passing ordinances to prevent spitting.⁶⁴ Enforcement of the law varied from city to city. In 1908, only 4-5% of cases were reported in Indianapolis, compared to Minneapolis, where the law was enforced so strongly that it “practically abolished spitting in the city.”⁶⁵ These laws were not accepted easily; many argued that it was an American right to be able to spit where one pleased. This was countered by the argument that it was the right of society to not have their

⁵⁹ Hippocrates, *Aphorisms of Hippocrates*, 119; M. Hancox, “Bovine Tuberculosis: Milk and Meat Safety,” *The Lancet*, vol. 359, issue 9307 (2002), 706–707.

⁶⁰ Alan L. Olmstead and Paul W. Rhode, “An Impossible Undertaking: The Eradication of Bovine Tuberculosis in the United States,” *The Journal of Economic History*, vol. 64, issue 3 (2004), 735.

⁶¹ *Ibid.*, 736.

⁶² *The Philistine*, vol. 19, issue 2 (1904), 70.

⁶³ Jeanne E. Abrams, “Spitting is Dangerous, Indecent, and Against the Law! Legislating Health Behavior during the American Tuberculosis Crusade,” *Journal of the History of Medicine and Allied Sciences*, vol. 68, issue 3 (2013), 426.

⁶⁴ Abrams, “Spitting is Dangerous,” 430.

⁶⁵ Philip Peter Jacobs, *The Campaign against Tuberculosis in the United States* (New York: Charities Publication Committee, 1908), 360, 370.

health threatened and that the rights of the masses outweighed the rights of the individual.⁶⁶ This argument held more weight and anti-spitting laws were upheld. The National Association for the Prevention of Tuberculosis (NAPT) in Britain admired the work done in the United States regarding anti-spitting legislation and employed its own anti-spitting campaign. This campaign relied primarily on fear tactics to prevent spitting. This led to some cities in Britain adopting their own anti-spitting laws in attempts to stop the spread of tuberculosis.⁶⁷

Another major consequence of “tuberculophobia” was the sanatorium movement, which would persist from the mid-1800s into the second half the 1900s. Throughout the 19th century, tuberculosis patients had been rejected from voluntary hospitals. Much like in Hippocrates’s time, doctors did not want to be surrounded by incurable patients because it showed the limitations of their skills and of the medical world.⁶⁸ As society became more aware of the infectious nature of tuberculosis, tuberculous patients were increasingly excluded from hospitals.⁶⁹ In the eyes of the medical community, tuberculosis was considered practically incurable, and the presence of consumptives in hospitals was pointless, even dangerous. It was argued consumptives wasted space and resources that could be used for other more treatable cases. More importantly, consumptives were infectious and could spread tuberculosis to others in the hospital. The solution to the rejection of tuberculosis victims was the creation of sanatoriums.

When sanatoriums began opening in 1859, they were initially ridiculed.⁷⁰ After the contagious nature of tuberculosis became known to a more widespread audience, the idea of sanatoriums began to gain momentum, with sanatoriums being built in the United States and Western Europe. According to Dr. David Jacob Aaron Chowry-Muthu, a British sanatorium physician, the ideal sanatorium was isolated, located no closer than three miles to any town or railroad.⁷¹ Treatment consisted of rest and fresh air, although some sanatoriums recommended light exercise when a patient was doing well.⁷²

⁶⁶ Abrams, “Spitting is Dangerous,” 435.

⁶⁷ Bryder, *Below the Magic Mountain*, 18.

⁶⁸ Bryder, *Below the Magic Mountain*, 22.

⁶⁹ *Ibid.*, 23.

⁷⁰ Chowry-Muthu, *Pulmonary Tuberculosis and Sanatorium Treatment*, v.

⁷¹ *Ibid.*, 130.

⁷² *Ibid.*, 136.

Sanatoriums believed that pure air was the key to recovery; as a result, patients spent much of their time on open-air porches when the sanatoriums first opened. This was especially popular in the first few decades of the 20th century and could be seen in sanatoriums across the country. William Spear, a doctor at the Oakdale Sanatorium near Iowa City, Iowa, described his experience with open-air porches as followed:

"When I arrived, they were behind the times in terms of surgical treatment of tuberculosis... Patients were forced to stay in bed in open-air cottages. You froze them in the wintertime, and roasted them in the summertime. Patients didn't leave their beds unless it was absolutely necessary."⁷³

The main purpose of sanatoriums was to isolate the sick from the rest of the population. Some tuberculosis specialists even suggested that isolation of the sick should be mandatory.⁷⁴ Patients at sanatoriums were, indeed, isolated and were well aware of it. The location of sanatoriums tended to be away from towns and railroads and at higher elevations. The public was afraid of airborne nature of the disease; they believed that if they even breathed the same air as a consumptive, they would fall ill. The geographical isolation made sanatoriums difficult to reach for visitors.⁷⁵ Even if visitors could reach the sanatorium, it was often discouraged. A patient from the Oakdale Sanatorium expressed, "When visitors come, your heart beats faster and your temperature goes up. And when your doctor tells you that you cannot receive visitors today or tomorrow it is not because he is mean but because he thinks it is best for you."⁷⁶ Even within the sanatorium patients were not allowed full interaction. Wings of the sanatoriums were divided by gender and color, and interactions between men and women and between blacks and whites were not allowed. Patients were prevented from socially interacting in the same way as they would outside of the sanatorium.⁷⁷ The prevention of interaction was intended to control the spread of contagion.

⁷³ Tom Walsh, "Community Health," *UI Sesquicentennial*, Spring 1997, Box 1, Oakdale Sanatorium Records, University of Iowa Archives, RG27.0020.

⁷⁴ Bryder, *Below the Magic Mountain*, 130.

⁷⁵ *Ibid.*, 200.

⁷⁶ "Why Rest," *The Iowa Stethoscope*, May (?), Dr. Spear's Scrapbook, Box 7, Oakdale Sanatorium Records, University of Iowa Archives, RG27.0020.

⁷⁷ Newspaper clipping, 1956, Dr. Spear's Scrapbook, Box 7, Oakdale Sanatorium Records, University of Iowa Archives, RG27.0020; *Annual Report State Sanatorium 1943*, 1943, Box 2, Oakdale Sanatorium Records, University of Iowa Archives, RG.27.0020.

Even without these restrictions, many still would have been isolated socially. Often, patients were regarded as social pariahs and rejected by the rest of society.⁷⁸ Due to financial reasons, many sanatoriums released patients before they were completely healthy.⁷⁹ The Public Affairs Committee of the U.S. Chamber of Commerce estimated that in the early years of sanatoriums, a third of the patients left while they were still sick.⁸⁰ The outside world was well aware that some of the ex-sanatorium patients were not fully healed; as a result, many people viewed ex-patients as contagious. This made getting a job difficult; not only did many employers fear acquiring the illness themselves, they also believed that former patients would not be as efficient of workers as non-patients.⁸¹ There were two popular options for dealing with this. One option was to be hired at the sanatorium upon release. Sanatoriums often had difficulty filling positions because of the contagious nature of tuberculosis and the stigma surrounding sanatoriums.⁸² Not only would sanatoriums hire them, former patients could also use the work at the sanatorium to gain confidence before reentering society; it proved that they were capable of reentering the workforce and supporting themselves. After living at the sanatorium for so long, some patients had developed a dependency on it. A 1948 study on the patients of the Jefferson Tuberculosis Sanatorium found that many patients feared a loss of status upon their return to society because of their disease.⁸³ The second option to prevent rejection by an employer was for patients to keep their institutionalization a secret.

Employers were not the only ones patients refused to disclose their past to. Patients even went so far as to hide their illness from their family and relatives.⁸⁴ Social stigma surrounding tuberculosis was so strong that even families could not always be counted on for support. Patients were found to

⁷⁸ Bryder, *Below the Magic Mountain*, 202–203.

⁷⁹ Amy L. Fairchild and Gerald M. Oppenheimer, “Public Health Nihilism vs Pragmatism: History, Politics, and the Control of Tuberculosis,” *American Journal of Public Health*, vol. 88, issue 7 (1998), 1107.

⁸⁰ Alton L. Blakeslee, *TB—The Killer Cornered*, Public Affairs Pamphlet 156, 1949.

⁸¹ Blakeslee, *TB—The Killer Cornered*.

⁸² Bryder, *Below the Magic Mountain*, 213–214.

⁸³ Mildred Young, “A Study of the Adjustment of Patients Discharged from the Jefferson Tuberculosis Sanatorium between November, 1945, and November, 1946,” 1948, ETD Collection for AUC Robert W. Woodruff Library: paper 428, 11.

⁸⁴ Bryder, *Below the Magic Mountain*, 218.

fear the potential infidelity of their spouses during their stay in a sanatorium.⁸⁵ If patients suffered from tuberculosis prior to marriage, spouses were often kept in the dark about the past illness, which was a serious matter in the eyes of the legal system. Not disclosing a past tuberculosis diagnosis was grounds for divorce. Not only was this due to the infectious nature of tuberculosis but also the belief that the consumptive's children would be predisposed to tuberculosis.⁸⁶ In the New York Supreme Court case *Sobol v. Sobol*, it was found that the husband had been treated for tuberculosis prior to his marriage and that his physician had described him as "incurable."⁸⁷ His wife discovered this when he relapsed, and she subsequently filed for divorce, which was granted. The following was said in regards to the annulment: "Furthermore, there is little doubt that the offspring of a person afflicted with tuberculosis, while not born infected, are born with a strong predisposition to becoming infected, and succumb with greater readiness to its ravages."⁸⁸

The belief that tuberculosis was hereditary had ended, but it was replaced with the notion that predispositions to the disease were hereditary.⁸⁹ This argument took off in the beginning of the 20th century. In 1910, Charles B. Davenport, an American zoologist at the Station of Experimental Evolution in Long Island, created the Eugenic Record Office, which was dedicated to promoting the idea that tuberculosis was hereditary.⁹⁰ Davenport argued that consumptives should not marry, saying that they would produce "incompetents" for children and it would increase the tax burden.⁹¹ Eugenicists—people who believe "inferior" humans should not breed—began to dissuade marriage between consumptives and attempted to have laws passed in order to prevent these marriages. People were so convinced that predispositions to tuberculosis were hereditary that eugenicists were able to present a plan for the sterilization of consumptives that the nation actually considered. The plan would be simple to execute, they argued, because most

⁸⁵ Young, "A Study of the Adjustment of Patients Discharged from the Jefferson Tuberculosis Sanatorium between November, 1945, and November, 1946," 11.

⁸⁶ Bryder, *Below the Magic Mountain*, 221.

⁸⁷ *Sobol v. Sobol*, 150 N. Y. Sup., 248, (1914).

⁸⁸ *Sobol v. Sobol*.

⁸⁹ Philip K. Wilson, "Confronting 'Hereditary' Disease: Eugenic Attempts to Eliminate Tuberculosis in Progressive Era America," *Journal of Medical Humanities*, vol. 27, issue 1 (2006), 25.

⁹⁰ Wilson, "Confronting 'Hereditary' Disease," 21.

⁹¹ *Ibid.*, 24.

tuberculosis victims were gathered in sanatoriums already.⁹² However, the 1930s produced too much evidence that pointed toward contagion, which conflicted with the idea of heredity, and as a result, the eugenicists lost much of their support.⁹³

While the disease was not hereditary, it did affect certain people more than others. At the end of the 19th century, it was clear that tuberculosis was a disease of the poor:

“The prevalence of consumption is proportional to overcrowding, dampness of soil, bad food, overwork, exhaustion, alcoholism, and above all to smallness of room and absence of ventilation and sunlight, especially when combined with overcrowding, as it universally is.”⁹⁴

At the beginning of the 20th century, tuberculosis caused 22% of deaths among the poor, while only causing 16% of the deaths among wealthier individuals in the United States.⁹⁵ If one belonged to the middle class when they were healthy, contracting tuberculosis could easily throw them and their family into poverty. Prices of sanatoriums ranged drastically; some were free, while others could cost quite a bit of money. In 1907, the Loomis Sanatorium in Liberty New York cost anywhere from \$15-\$35 per week (approximately \$384-\$900 in today’s world).⁹⁶ Oakdale Sanatorium cost \$30 a month (about \$800) in 1908.⁹⁷ In 1943, a total year at Oakdale Sanatorium was \$780 or \$65 per month (about \$10,800 and \$900 respectively).⁹⁸ This was a financial burden on patients and their family, especially when the poor were the most likely to get sick due to crowded living conditions and lack of sanitation.

Immigrants and minorities were more likely to live in poverty and, therefore, more likely to contract tuberculosis. Chinese immigrants were nearly four times more likely to die of tuberculosis than white Americans, according

⁹² Ibid., 31.

⁹³ Ibid., 33–34.

⁹⁴ T. F. S. Caverhill et al., “A Discussion on the Open-Air Treatment of Consumption,” *The British Medical Journal*, vol. 2, issue 1970 (1898), 947.

⁹⁵ Lilian Brandt, “Social Aspects of Tuberculosis,” *The Annals of the American Academy of Political and Social Science*, vol. 21 (1903), 409.

⁹⁶ *Eleventh Annual Report of the Loomis Sanatorium and Annex for the Treatment of Tuberculosis*, 1907.

⁹⁷ Jacobs, *The Campaign against Tuberculosis*, 38.

⁹⁸ *Annual Report State Sanatorium 1943*.

to the American Academy of Political and Social Science.⁹⁹ The Public Affairs Committee of the U.S. Chamber of Commerce stated that in the United States, blacks were three times more likely to die than whites from tuberculosis.¹⁰⁰ Eugenicists jumped at these statistics, using them to support their argument of white racial superiority. While it had little to do with race and everything to do with poverty, race was blamed. Society believed that the Chinese contracted tuberculosis because they had too many children in the slums, blacks were “ignorant of the simplest laws of hygiene,” and Native Americans’ contraction of the disease was a “disastrous effect of civilization on a savage race.”¹⁰¹ Tuberculosis only further justified white superiority to the rest of the nation.

To society, tuberculosis not only preyed on minorities but on those who consumed alcohol, a characteristic associated with poverty. Excessive alcohol was said to triple the susceptibility to tuberculosis.¹⁰² As a result, Scandinavian and Irish immigrants were looked down upon due to the stereotype of having high intemperance.¹⁰³ To society, these immigrants deserved their illness because of their behaviors. Tuberculosis only helped solidify the stereotypes associated with these groups of people.

Other stereotypes existed amongst victims of tuberculosis. In 1903, Lilian Brandt of the American Academy of Political and Social Science wrote, “There are statistics indicating that consumptives and the children of consumptives are more liable than others to insanity and idiocy.” Tuberculosis was also believed to be linked with sexual promiscuity, a socially unacceptable behavior.¹⁰⁴ In the beginning of the 1900s, if a parent had contracted syphilis, it was believed that the child was much more susceptible to contracting tuberculosis.¹⁰⁵ Not only were the sick viewed as degenerate, but they were also seen as a burden to society. Irving Fisher, an early 20th century economist, estimated tuberculosis was costing the United States over \$1.1 billion per year in the first half of the 20th century.¹⁰⁶

⁹⁹ Brandt, “Social Aspects of Tuberculosis,” 411.

¹⁰⁰ Blakeslee, *TB—The Killer Cornered*.

¹⁰¹ Brandt, “Social Aspects of Tuberculosis,” 411–412.

¹⁰² *Ibid.*, 411.

¹⁰³ *Ibid.*, 413.

¹⁰⁴ *Ibid.*, 415.

¹⁰⁵ Chowry-Muthu, *Pulmonary Tuberculosis and Sanatorium Treatment*, 18–19.

¹⁰⁶ Wilson, “Confronting ‘Hereditary’ Disease,” 24.

Attitudes toward tuberculosis patients changed drastically with the development of streptomycin in 1943, the first effective drug for treating tuberculosis. In the early 1950s, chemotherapy was found to be an effective form of treatment as well.¹⁰⁷ Stigma surrounding tuberculosis began to fade until it was no more severe than the stigma surrounding any other contagious disease. Contagious individuals were still avoided and isolated in sanatoriums. However, upon their return to society, they were not feared as they had been in the past. People trusted that those who had been dismissed from sanatoriums were no longer contagious.¹⁰⁸ Vocational rehabilitation in sanatoriums allowed for patients to feel confident upon returning to work. Between 1947 and 1948, states trained and placed 4,443 former tuberculosis patients in jobs; 21,000 had been helped in the last decade. Hundreds of thousands of patients were able to get normal, full-time jobs during this time period.¹⁰⁹ They were restored in society's eyes, as they were no longer a burden. The return to contributing to the economy and to the nation made them appear useful to society instead of useless.

In the Western world, society has been aware of tuberculosis throughout history. In ancient times, the sick were often discriminated against and isolated. During the Middle Ages, people were led to believe scrofula (a usually nonfatal form of tuberculosis that caused benign masses) could only be cured by a king's touch, lending monarchs more credibility to lay claim to the throne without opposition. The 19th and 20th centuries saw both a romanticized view and fear of tuberculosis. The sick were isolated in sanatoriums and stereotypes were formed about consumptives. Across these time periods, there was a lack of understanding of tuberculosis. People were unsure of how it was caused, how it spread, and who was more likely to become sick. In an attempt to make sense of tuberculosis, society created its own (often inaccurate) explanations. Many patients suffered discrimination because of their illness and were forced into isolation. Governments passed laws in order to control the spread of tuberculosis, which impacted countless citizens. The lack of understanding of tuberculosis even caused mass hysteria among many people in the Western world. In addition to countless lives being impacted by the disease itself throughout history, many more were affected by society's attempts to make sense of and combat tuberculosis. These explanations had a profound impact

¹⁰⁷ Byrder, *Below the Magic Mountain*, 257.

¹⁰⁸ Blakeslee. *TB—The Killer Cornered*.

¹⁰⁹ *Ibid.*

on society, shaping how the world reacted to tuberculosis and how the victims of this deadly disease were treated.

Bibliography

Primary Sources:

- Ansar, Harford & Company. "Dr. De Jongh's Light Brown Cod Liver Oil" (advertisement). *Cornhill Magazine*. Issue 36 (1864): 265–266.
- Aretæus. *De Causis et Signis Acutorum Morborum*, translated by Francis Adams. 1972.
- Blakeslee, Alton L. *TB—The Killer Cornered*. Public Affairs Pamphlet 156. 1949.
- Brandt, Lilian. "Social Aspects of Tuberculosis." *The Annals of the American Academy of Political and Social Science*. Volume 21 (1903): 407–418.
<https://doi.org/10.1177/000271620302100305>.
- Caverhill, T. F. S., William Calwell, B. J. Guillemard, A. Bourcat, J. E. Vivant, P. Sydney Jones, Jane Walker, W. A. Denton Johns, Frederick Churchill, and W. Bezly Thorne. "A Discussion on the Open-Air Treatment of Consumption." *The British Medical Journal*. Volume 2, Issue 1970 (1898): 946–949.
- Celsus. *De Medicina*, translated by F. Marx. Leipzig: B. G. Teubner, 1915.
- Chowry-Muthu, David Jacob Aaron. *Pulmonary Tuberculosis and Sanatorium Treatment: A Record of Ten Years of Observation and Work in Open-Air Sanatorium*. London: Baillière, Tindal and Cox, 1910.
- Eleventh Annual Report of the Loomis-Sanatorium and Annex for the Treatment of Tuberculosis*. 1907.
- Hippocrates. *Aphorisms of Hippocrates*. Translated by Elias Marks. New York City: Collins & Co., 1817.
- Hollós, Joseph. "Tuberculous Intoxications: Concealed and Masked Tuberculosis." *Journal of the American Medical Association*. Volume 93, Issue 10 (1929): 792.
<https://doi.org/10.1097/00007611-192907000-00035>.
- Jacobs, Philip Peter. *The Campaign against Tuberculosis in the United States*. New York: Charities Publication Committee, 1908.
- Loring & Company. "Ozone Anti-Germ Inhaler" (advertisement). *The American School Board Journal*. Volume 17, Issue 5 (1898): 27.
- The Philistine*. Volume 19, Issue 2 (1904): 67–70.
- Thoreau, Henry David. "September 26th, 1859." *Journal 15: 1859–1860*.
http://thoreau.library.ucsb.edu/writings_journals_pdfs/J15f4-f6.pdf.
- Oakdale Sanatorium Records. University of Iowa Archives. RG27.0020.
- . *Annual Report State Sanatorium 1943*. 1943. Box 2.

- . Newspaper clipping. 1956. Dr. Spear's Scrapbook. Box 7
- . Walsh, Tom. "Community Health." *UI Sesquicentennial*. Spring 1997. Box 1.
- . "Why Rest." *The Iowa Stethoscope*. May (?). Dr. Spear's Scrapbook. Box 7.
- Young, Mildred. "A Study of the Adjustment of Patients Discharged from the Jefferson Tuberculosis Sanatorium between November, 1945, and November, 1946." 1948. ETD Collection for AUC Robert W. Woodruff Library: paper 428. 11.

Secondary Sources:

- Abrams, Jeanne E. "Spitting is Dangerous, Indecent, and Against the Law! Legislating Health Behavior during the American Tuberculosis Crusade." *Journal of the History of Medicine and Allied Sciences*. Volume 68, Issue 2 (2013): 416–450. <https://doi.org/10.1093/jhmas/jrr073>.
- Aronson, Stanley M. "An Alien Legend with a Bite." *Rhode Island Medical Journal*. Volume 91, Issue 6 (2008): 159.
- Bell, Michael E. "Vampires and Death in New England, 1784 to 1892." *Anthropology and Humanism*. Volume 31, Issue 2 (2006): 124–140. <https://doi.org/10.1525/ahu.2006.31.2.124>.
- Brăilean, Tiberiu and Aurelian-Petruș Plopeanu. "Christianity and Political Democracy in the Middle Ages and Modern Times." *Human and Social Studies*. Volume 2, Issue 2 (2013): 119–137. <https://doi.org/10.2478/hssr-2013-0007>.
- Bray, Fleta N., Mohammed Alsaïdan, Brian J. Simmons, Leyre Ainara Falto-Aizpurua, and Keyvan Nouri. "Scrofula and the Divine Right of Royalty: The King's Touch." *JAMA Dermatology*. Volume 149, Issue 1, (2015): 702. <https://doi.org/10.1001/jamadermatol.2015.0449>.
- Bryder, Linda. *Below the Magic Mountain: A Social History of Tuberculosis in Twentieth-Century Britain*. New York: Oxford University Press, 1988.
- Corrigan, Maureen. "In 'The Brontës,' Details of a Family's Strange World." Review of *The Brontës: Wild Genius on the Moors*, by Juliet Barker. *National Public Radio*. 27 August 2012, Book Reviews.
- Cushing, Angela. "Illness and Health in the Ancient World." *Collegian*. Volume 5, Issue 3 (1998): 44. [https://doi.org/10.1016/S1322-7696\(08\)60304-2](https://doi.org/10.1016/S1322-7696(08)60304-2).
- Daniel, Virginia S., and Thomas M. Daniel. "Old Testament Biblical References to Tuberculosis." *Clinical Infectious Diseases*. Volume 29, Issue 6 (1999): 1557–1558. <https://doi.org/10.1086/313562>.
- Davies, R. W. "Medicine in Ancient Rome." *History Today*. Volume 21, Issue 11 (1977): 770–778.
- Dyer, Carol. *Biographies of Disease: Tuberculosis*. Santa Barbara: Greenwood, 2010.

- Eddy, Jared J. "The Ancient City of Rome, Its Empire, and the Spread of Tuberculosis in Europe." *Tuberculosis*. Issue 95 (2015): S23–S28. <https://doi.org/10.1016/j.tube.2015.02.005>.
- Fairchild, Amy L. and Gerald M. Oppenheimer. "Public Health Nihilism vs Pragmatism: History, Politics, and the Control of Tuberculosis." *American Journal of Public Health*. Volume 88, Issue 7 (1998): 1105–1117. <https://doi.org/10.2105/AJPH.88.7.1105>.
- Frith, John. "History of Tuberculosis. Part 1 – Phthisis, Consumption, and the White Plague." *Journal of Military and Veterans' Health*. Volume 22, Issue 2 (2014): 29–35.
- Hancox, M. "Bovine Tuberculosis: Milk and Meat Safety." *The Lancet*. Volume 359, Issue 9307 (2002): 706–707. [https://doi.org/10.1016/S0140-6736\(02\)07786-3](https://doi.org/10.1016/S0140-6736(02)07786-3).
- Hays, J. N. *The Burdens of Disease: Epidemics and Human Response in Western History*. New Brunswick: Rutgers University Press, 2009.
- Longrigg, James. "Death and Epidemic Disease in Classical Athens," in *Death and Disease in the Ancient City*, edited by Valerie M. Hope and Eireann Marshall, 55–64. London: Routledge, 2002.
- Meyer, B. "Til Death Do Us Part: The Consumptive Victorian Heroine in Popular Romantic Fiction." *Journal of Popular Culture*. Volume 37, Issue 2 (2003): 287–308. <https://doi.org/10.1111/1540-5931.00069>.
- Morris, David M. "At the Deathbed of Consumptive Art." *Emerging Infectious Diseases*. Volume 6, Issue 11 (2002): 1353-1358.
- Olmstead, Alan L. and Paul W. Rhode. "An Impossible Undertaking: The Eradication of Bovine Tuberculosis in the United States." *The Journal of Economic History*. Volume 64, Issue 3 (2004): 734–772. <https://doi.org/10.1017/s0022050704002955>.
- Roberts, Charlotte A. and Jane E. Buikstra. *The Bioarchaeology of Tuberculosis: A Global View on a Reemerging Disease*. Gainesville: University Press of Florida, 2003.
- Sledzik, Paul S. and Nicholas Bellantoni. "Brief Communication: Bioarcheological and Bioculture Evidence for the New England Vampire Folk Belief." *American Journal of Physical Anthropology*. Volume 91, Issue 2 (1994): 269–274. <https://doi.org/10.1002/ajpa.1330940210>.
- U.S National Library of Medicine. "Tuberculosis." *MedlinePlus*. 1 October 2016. Accessed 9 October 2016. <https://medlineplus.gov/tuberculosis.html>.
- Waksman, Selman A. *The Conquest of Tuberculosis*. Berkeley and Los Angeles: University of California Press, 1964.
- Wheeler, Susan. "Medicine in Art: *Henry IV of France Touching for Scrofula*, by Pierre Firens." *Journal of the History of Medicine and Allied Sciences*. Volume 58, Issue 1 (2003): 79–81. <https://doi.org/10.1093/jhmas/58.1.79>.

Wilson, Philip K. "Confronting 'Hereditary' Disease: Eugenic Attempts to Eliminate Tuberculosis in Progressive Era America." *Journal of Medical Humanities*. Volume 27, Issue 1 (2006): 19–37. <https://doi.org/10.1007/s10912-005-9001-6>.