An Examination of How the Introduction of Old World Diseases Affects Indigenous Communities' Relationship with Medicine

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Abstract

The legacy of Old World diseases has historically been focused on emphasizing the immense depopulation of Indigenous peoples in North America. However, newer research has started utilizing interdisciplinary approaches to investigate these deadly diseases. This research paper will contribute an overview of how infectious diseases brought to North America by colonialism have altered and decimated the relationship between Indigenous communities and medicine. Using a diverse collection of interdisciplinary data including historical documentation, bioarchaeological data surrounding the biological and socio-cultural effects of colonialism, as well as ethnographic data and relevant theoretical inquiry, this investigation seeks to understand how colonialism acted as an agent of infectious disease which contributed to the implementation of colonial medicine/biomedicine. The research conducted found that the biological abscess of depopulation through genetic studies showed a loss of diversity and population size, coinciding with European arrival. Further historical investigations illustrated how colonial medicine and policies, implemented as a response to disease, resulted in a significant cultural loss. The examination of ethnographies demonstrated that modern Indigenous populations are still affected by the legacy of Old World diseases, specifically in regard to the practicing traditional medicine and current biomedical mistrust within the Indigenous community. Ultimately, this collection of data demonstrates the disruption of traditional medicine which resulted in current Indigenous communities' mistrust of modern health systems. This research is significant because it expands on the modern research being conducted to re-examine and re-frame the common interpretations of the role of disease in the colonial process. Connecting the effects of colonialism in the past to the current situation of health and medicine allows for a critical perspective to be taken on how the colonial legacy lives on in modern Indigenous peoples' mistrust. Understanding the roots of mistrust toward our current medical system is a critical step toward reconciling Indigenous peoples' relationship with medicine.

Keywords: Medical Mistrust, Colonialism, Traditional Medicine, Infectious Disease

Introduction

During the period between the 16th and the 20th century, European nations influenced the world's social, cultural and geographic situation so dramatically that the effects are still seen today. As a result of colonization, especially in what is now the United States, Indigenous communities suffered massive societal collapse due to the loss of population as well as culture and knowledge. This loss of culture and knowledge is apparent through the lens of Indigenous health. This article presents an overview of how infectious disease brought to the United States altered and decimated the relationship between Indigenous communities and medicine. It demonstrates, through an examination of data including biological, historical, and anthropological ethnographic information, how colonialism acted as an agent for infectious disease which contributed to the implementation of colonial medicine/biomedicine. Ultimately, this paper will illustrate how the disruption of Indigenous traditional medicine resulted in current Indigenous communities' mistrust of modern health care.

There is a significant lack of research regarding the Indigenous community in both the fields conducting biological and cultural analysis, from the 16th century to the present day. The archaeological and historical data from the time period and location is limited. Moreover, the interest in Indigenous communities as an area for academic research is fairly recent and these topics were often not of interest or priority to researchers in the past. This further limits the research available to be analyzed. On a biological level, the concepts of acquired immunity and imported infectious diseases are not well understood due to the reasons discussed below. By bringing together the limited resources available this paper demonstrates the importances and significance of carrying out research that continues to fill these gaps in knowledge and understanding.

Background

After European contact, the Native population in North America was reduced by up to 95% due to epidemics that were likely caused by the novel diseases which Europeans brought to the Americas (Collen et al., 2022). Most current statistical estimates of Indigenous depopulation in the current United States state that there were approximately 12 million deaths between 1492 and 1900 with an additional 200,000 deaths occurring after 1900 (Smith, 2017). This is a small portion of the widespread global Indigenous depopulation which was estimated to have caused 175 million deaths in the Western Hemisphere during the same time period (Smith, 2017).

In order to understand why Old World diseases affected the Americas in such a severe manner, one has to understand the evolutionary history of the two societies. European societies transitioned from hunting and gathering to agriculture and animal husbandry early in comparison to Indigenous tribes (Collen et al., 2022). Domestication of fauna meant humans lived in close contact with these animals allowing viruses, bacteria and fungi infecting these animals to spread and infect humans as well. Infectious diseases transmitted from animals to humans are called zoonotic diseases and tend to be far more dangerous than other kinds of microbes (Collen et al., 2022).

Zoonotic diseases like influenza, smallpox, measles and tuberculosis that originated in Western Eurasia are often called civilization diseases, also referred to as Old World diseases, as the formation of city centers led to their growth and spread (Collen et al., 2022). The establishment of cities and subsequent urbanization led to high population density in concentrated areas and poor sanitation due to the build-up of waste and contaminated water. This created an ideal breeding ground for germs to spread and eventually infect humans. As this occurred early in Europe’s history, these diseases evolved along with humans, and people in

areas with such conditions eventually acquired immunity over time due to their continued exposure over generations. This relationship between humans and microbes can be seen in ancient DNA records (Collen et al., 2022).

Eventually, these zoonotic Old World diseases that had developed in the breeding ground of Europe were transferred over to the New World when imperial expeditions started to explore the Americas. The virgin soil theory states that mass depopulation occurred due to a lack of genetic resistance or acquired immunity against Old World diseases that were not present in the Americas pre-European contact (Jones, 2003). The Black Legend Hypothesis builds upon the virgin soil hypothesis, acknowledging the importance of infectious disease and genetic resistance while giving greater significance to the factors that led to societal collapses such as war, enslavement, famine, infrastructure loss and overall stress on society as a result of colonization (Collen et al., 2022).

Current historical perspectives concerned with the effects of disease on the Indigenous populations in North America follow a similar direction to the previous biological research. These perspectives rely on a material level of analysis that understands the direct impact of diseases through depopulation. The virgin soil theory has been a leading framework in historically investigating the spread of disease. The discussions loosely present the effects of diseases through the loss of Indigenous life in contrast to the European settlers (Jones, 2003). Although the role of race, politics and genocide are present in these narratives, the role of infectious disease introduction by Europeans is kept within its historical context and lacks the expansion beyond colonial borders (Jones, 2003).

The theory of ecological imperialism has been an important historical perspective to consider when investigating disease and colonialism. It demonstrated a shift towards a more

socio-ecological theory of disease, pushing the narrowed implication of the virgin soil theory. Alfred Crosby coined the term “ecological imperialism” to describe the transfer of pathogens triggered by exploration and conquest (Greene et al., 2019). He suggested that the infectious disease spread across the regions was a weapon of imperialism that advanced European settlers' success in colonizing land and people. The theory also brought about a debate on whether or not the spread of disease was accidental or deliberate (Waldram, 1995).

Methods & Materials

This paper is a meta-analysis that brings together findings from a variety of disciplines such as anthropology, genetics, archaeology, sociology and history to examine the relationships between colonialism, infectious disease and the current state of Indigenous communities in the United States. The paper looks at a variety of research such as ethnographies, archaeological records, statistics and DNA analyses in order to obtain a holistic understanding of the topic. In conducting research, articles were systematically filtered to only include peer-reviewed and published academic journal articles. In regards to the ethnographies, the inclusion criteria was journal articles that mentioned traditional medicine and the location was limited to the USA. The search criteria for the biological perspective focused on newer research and the majority of the articles under analysis for this portion heavily featured quantitative data and were published in the past ten years.

This paper looks at the findings from Collen et al. (2022) that analyzed DNA data from a dataset of over two hundred mitochondrial DNA genomes of North American descent, to study the genetic impact of colonization on Indigenous populations. This paper also refers to the statistics tests performed by Jones (2014) in order to find the correlation between first European contact, instances of sustained European contact, location, time and massive depopulation

events. The archaeological records assembled by Jones et al. (2021) contain over 15,000 burials from prehistoric times (5000 years before the present), pre-European contact and post-European contact.

The paper also utilizes four recent ethnographies from Indigenous peoples in the United States (Struthers & Eschiti, 2005; Schneider & DeHaven, 2003; Schwing, 2008; Bassett et al., 2012). The ethnographies focus on traditional healing stories, utilizing culture as a way to heal from colonial trauma and incorporating traditional medicine to work with the biomedical model prevalent currently. The use of ethnographies to study Indigenous populations is especially important since they give perspectives from within the community and help address the gap in knowledge that resulted from the loss of knowledge in the past (Jacklin et al., 2011). The use of ethnographies also allows those affected to tell their stories and assists in the decolonization of knowledge.

Results

After analyzing both the ancient DNA studies from Collen et al.(2022) and the historical/archaeological evidence from Jones (2014), it showed that sustained and persistent European contact with the Indigenous population led to massive depopulation. A dataset of 200 DNA genomes showed a 50% decrease in diversity and population size of North American lineages that coincided with the arrival of Europeans to the continent (Collen et al., 2022). There are at least 42 geographically isolated accounts of disease-related massive depopulation events between 1519 and 1782 in North America mentioned in historic and archaeological records (Jones, 2014). Historical records and limited archaeological evidence also demonstrate that pathogens imported into the Americas spread in small pockets within densely populated areas but no singular disease covered the entirety of the United States (Jones, 2014). The New World

was not completely disease free and there is evidence of hepatitis, rabies, herpes and poliomyelitis present in the Americas before European contact was established (Martin & Goodman, 2002). However, there is no evidence of diseases such as smallpox, influenza, measles and mumps existing in Indigenous populations prior to Europeans discovering the Americas (Martin & Goodman, 2002).

Mapping all available historical and archaeological data based on geographic location and time resulted in a moderately positive correlation between the location of contact, sustained contact and depopulation (Jones, 2014). Records additionally show that the date of contact across North America was distributed over time which may have been the reason there was no single large-scale pandemic occurring continent-wide and instead, small pockets of heavily populated areas experienced depopulation anywhere from 1616 to 1782 (Jones, 2014). This is further supported by Jones et al. (2021) who reported Indigenous populations began showcasing population trends similar to societies experiencing the plague only after the establishment of Spanish settlements in California in 1770 based on the osteological record studied.

In recent decades, the historical research done on infectious disease and colonialism has expanded in a variety of directions. Decolonization practices of epidemiology have begun to review the previous historical perspectives (Jacklin et al., 2011). There seems to be a paradigm shift from a biological-only basis to viewing massive depopulation in the past to a more holistic approach that addresses the devastating effects colonization itself had on Indigenous communities.

By expanding the historical discourse to include a more diverse and inclusive comprehension of the spread of disease, it is clear that there was much more behind infectious diseases spread to North American Indigenous populations than in previous studies.

Socio-ecological theories of disease examine the interrelated demographic, social, political, environmental and contextual factors that included considering violence and warfare as well as changes in cultural practices, as very serious considerations towards the narrative of disease in post-contact North America (Waldram, 1995). Further research found that history was rich with examples of colonial projects that actively took pathogens into their own hands as a weapon to aid their conquest. For instance, even as late as 1763 in North America, British officials were giving out blankets that were purposefully infected with smallpox (Greene et al., 2019).

The differential vulnerability to the epidemics of disease, identified by the virgin soil theory in particular, has faced criticism in more recent work (Waldram et al., 1995; Jones, 2003). The virgin soil theory should not be dismissed but its lack of consideration for other factors which would have impacted disease spread is noteworthy. Arguments like the virgin soil theory are widely accepted due to their anodyne nature. It fits within the narrative already established by the European understanding of disease and Indigenous communities (Waldram et al., 1995). Consequently, these arguments can reinforce stereotypes regarding Indigenous health, diminishing the responsibility of European colonization, and also reaffirming European medical superiority (Waldram et al., 1995). Additionally, more research displays how this concept of differential vulnerability informed the logistics of imperial expansion as well as the racial ideologies that were used to justify acts of colonization during the 16th-17th century (Greene et al., 2019).

In response to the epidemic of disease, such as that of smallpox in Western North America, medical institutions and practices that mirrored those in Europe were established (Greene et al., 2019). For instance, Britain's Colonial Medical Service was in charge of implementing clinics and hospitals in particular colonies. The building plans mirrored those

familiar to the Colonial Medical Service and were staffed by physicians who had trained in Europe to work in the colonies (Greene et al., 2019); These medical centers were symbols of imperial power and another method of domination of the Indigenous population. Similar to the virgin soil theory, colonial medicine became a tool to justify the colonial mission and a way to assert superiority over the local communities' practices. Historical approaches that engage with the narrative of disease and colonial medicine post-contact, expose that this was only the beginning of control and domination through medicine. Throughout the 20th-century scholars have been able to identify similar controlling practices of institutionalizing Western colonial ideologies of medicine and continuing to oppress traditional medicine (Greene et al., 2019). As these Western systems were being embedded so were the colonial ideologies that position Indigenous people in a dehumanized role as inferior to the Europeans and tended to deal with Indigenous peoples as populations rather than individuals. Therefore, by implementing these ideologies within the medical institutions, hospitals and doctors were able to exert power by adjudicating health status and care (Greene et al., 2019). Regardless of the decline of epidemics during the mid-20th century, promotion and enforcement of health policies related to biomedicine furthered the underlying implications of colonial medicine (Greene et al., 2019; Struthers & Eschiti, 2005). Institutions are still aimed at modernizing traditional cultures and focus on technical interventions such as vector control through vaccination. This ultimately had success in disease control such as in the case of smallpox, yet it still dismissed and devalued Indigenous peoples' cultural perspectives and colonial trauma (Greene et al., 2019).

In addition, a different approach towards research that engages with the implications of infectious diseases brought to North America by colonialism is found among ethnographic narratives. While there is an abundant variety of different ethnographic research conducted in the

post-contact and modern times, there is a notable pattern that investigates the relationship of Indigenous communities with medicine. Many of these ethnographic studies, such as Cashin's (2000), discuss trauma and multigenerational trauma and its relationship to Western and traditional healing methods. These discussions exhibit the disruption and destruction of life both physically and culturally against the Indigenous populations in North America during epidemics (Cashin, 2000; Bassett, 2012).

These ethnographies demonstrate how colonialism worked towards decimating Indigenous healing practices in periods when the communities were suffering immense loss. However, they also reveal how oral histories have kept the knowledge of traditional medicine alive in communities while also representing the damage that colonialism caused to Indigenous healing practices. For instance, Bassett et al (2012) uses perspectives from Native healers from North America to discuss the legacy of colonialism on current traditional healing practices that have survived due to oral histories. This work emphasizes how colonialism caused a dramatic shift in Indigenous health and health practices which still are present in modern Indigenous populations (Bassett et al., 2012).

Other ethnographic work illustrates the benefits of the current practice of traditional medicine (Struthers & Eschiti, 2005; Schneider & DeHaven, 2003; Schwing, 2008; Bassett et al., 2012). A study done on the Navajo society investigates how traditional healers in Northeastern Arizona, Northwestern New Mexico, and Southeastern Utah are able to help patients make better sense of their illnesses within a particular context which contemporary physicians often overlook. This more therapeutic view of health is incredibly beneficial to the unique conditions of modern Indigenous health yet is still unwelcomed by modern biomedical physicians and institutions (Schneider & DeHaven, 2003).

Discussion

The Black Legend hypothesis offers an alternative explanation that states that disease was not the primary cause of depopulation. Instead, it was part of a complex interconnected sociological issue. Some studies show that the rates of depopulation are higher than projected if disease (in this case, smallpox) was the only factor involved. There are many incidences of small local infections that had a debilitating effect on the Indigenous population and therefore, the Black Legend hypothesis cannot be applied (Collen et al., 2022). However, it is unclear whether the instances of isolated disease-related depopulation followed a similar pattern all over the country or if there is simply more evidence that survived through the archaeological and historical record while sociological causes were underreported and understudied.

These modern biological assessments of disease transmission during the colonial era demonstrate the previously concealed, complex nature of Old World disease. The surge of new historical perspectives has taken these new hypotheses of depopulation like the Black Legend Hypothesis to back up their assessment of infectious diseases' implications on the Indigenous community's health by broadening the narrative of factors that impacted the spread of disease. This opened a conversation about the wider implications of the effects of the disease both in the past and present. Understanding ecological imperialism enables a view into how colonialism was able to use the spread of disease, whether purposefully or accidentally, around all colonies, including North America, as a weapon to further the imperial project.

European immunity to Old World disease provided justification for ideologies of racial superiority (Waldram et al., 1995). Cultural genocide was easily accomplished in the context of epidemics, and as historical research demonstrates, this loss involved language, social structure, spiritual beliefs and practices. All of these are factors that are linked to traditional medicine.

The implementation of colonial medicine activity worked as a barrier against traditional medicine, as attitudes towards Indigenous cultural practices were viewed as inaccurate and overall harmful. Western medicine was understood and promoted as the rational and dominant scientific model of healing that was able to aid Indigenous populations being affected by infectious diseases (Schwing, 2008; Greene et al., 2019). Traditional medicine on the other hand was previously perceived as unscientific and irrational as it is common for North American Indigenous tribes to base medicine on the premise that the body is spiritually and physically connected to nature (Schwing, 2008).

As a result, strict laws regarding the rights of Indigenous traditional healing practices were introduced during the period of colonial power. In a number of cases in Western North America, and among other North American regions, the right to practice Native American religion, including healing approaches and rituals, was outlawed by the government (Struthers & Eschiti, 2005). In the 1880s, the United States government Secretary of the Interior set up Courts of Indian Offenses which actively worked to stop Indigenous communities from public and private ceremonies that involved the practices of medicine men (Struthers & Eschiti, 2005). In response, these medical practices were forced to conceal themselves. This established traditional medicine as a taboo. Indigenous individuals would face prejudice and ridicule when discussing and sharing knowledge of traditional medicine practices.

As a consequence, traditional medicine was nearly lost to a majority of Indigenous communities in North America during this period. Traditional medicine was able to be perceived as being passed down orally from generation to generation in communities, but the shame and guilt that had also been generationally ingrained remained as well in many cases (Struthers & Eschiti, 2005). Because of this, Indigenous populations were forced to rely on colonial medicine

(Greene et al., 2019). This shift and reliance on a medical system that was actively involved in controlling and oppressing the Indigenous population during and following periods of infectious disease epidemics, had destructive effects on Indigenous health in general as is unveiled in ethnographies' oral histories of multigenerational trauma, anxiety, and depression (Bassett et al., 2012). Furthermore, it created a relationship of mistrust towards colonial medicine that has formed a base for current Indigenous peoples' mistrust towards biomedicine (Canales et al., 2011).

Medical mistrust is one of the most noted barriers between members of Indigenous communities seeking clinical or biomedical health care (Canales et al., 2011). Participants in the Canales et al. study often shared how their patients' general mistrust of physicians, and their overall avoidance of the doctor and Western-style medical institutions, directly impacted their own mistrust. Outside of the intergenerational mistrust of Indigenous peoples, the current system of biomedicine still carries a stereotyping and dismissive nature toward traditional medicine (Canales et al., 2011; Schwing, 2008).

There is a lack of cultural awareness within the biomedical system, mostly on the part of healthcare professionals and physicians. This causes an inadequate understanding of patients' conditions and beliefs. The situation becomes more restricted when considering that due to the historical circumstances, Indigenous relationships with Western-style medicine have limited ability in negotiating and navigating clinical healthcare systems because of a lack of detailed clinical information provided to Indigenous communities (Bassett et al., 2012). The current attitudes toward traditional medicine contribute to the undermining of the benefits of traditional medicine, even though traditional medicine has reportedly been extremely beneficial under multiple circumstances, especially for those in the Indigenous population. The World Health

Organization (WHO) has recognized the importance of including "diverse health practices, approaches, knowledge and beliefs incorporating plant, animal and/or mineral based medicines, spiritual therapies" in providing health care to vulnerable populations. Other than its holistic and contextual understanding of Indigenous health circumstances, traditional medicine is also accessible, affordable and culturally appropriate for physical, mental and spiritual health (Bassett et al., 2012, pp. 19). As a result, it is recommended to integrate traditional healing practices into mainstream treatment when working with Indigenous patients (Bassett et al., 2012). The success of this is demonstrated in the case of the Navajo community. Traditional Navajo healers have been utilizing traditional Navajo mythology and healing practices, such as the Mountain Chant, alongside modern, ethnic and spiritual elements of health care and healing practices (Schneider & DeHaven, 2003). This therapeutic approach to health has been able to establish a beneficial link between individuals and the illness experience, something that has long been criticized in modern biomedicine care (Schneider & DeHaven, 2003).

Conclusion

By observing the impact of disease and colonialism in the past, it is clear that current issues in Indigenous communities are not exaggerated but rather have deep-rooted foundations that can be seen even today. New demographic and historical studies have called attention to our understanding of reliance, trauma, and the consequences of infectious diseases on Indigenous relationships to medicine.

The history of Indigenous health in North America is a story of generations of mistrust in the health system set up and perpetuated by colonial and federal policies and actions of neglect and mistreatment. By establishing a holistic narrative with biological, historical and contemporary considerations of Indigenous health, this research challenges the normative

approach and understanding of the introduction of disease to North America. This contributes to the calls for decolonizing Indigenous health, which is a crucial step toward reconciliation (Jacklin et al., 2011). Furthermore, a critical approach like this research is widely applicable to other cases of colonialism in which Indigenous traditional medicine was similarly affected by the spread of disease. This framework unveils the lasting legacy of systemic racism, inequality, violence, and loss of life and culture that colonialism still has on modern populations and modern systems of health. The success that traditional medicine has in assisting in the treatment of Indigenous health in the cases presented above can have related positive impacts on vulnerable communities. It has the possibility to help with healthcare disparities and inequalities found in North America's current healthcare system, while also showing the potential to advance medical care for mental health, trauma and chronic pain issues.

Further research should continue examining the relationship between the socio-cultural effects of colonialism and the massive Indigenous depopulation. It is evident that interdisciplinary perspectives are able to provide contextual and relevant information, such as unveiling the legacy of infectious disease on modern Indigenous populations.

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