Engaging Science, Technology, and Society

THEMATIC COLLECTION: SITUATING MICROBES ORIGINAL RESEARCH ARTICLE

Racism and *Vibrio cholerae*: A Sociogenic Approach to Understanding Pathogenicity

VICTORIA KOSKI-KARELL
UNIVERSITY OF WASHINGTON
UNITED STATES

Abstract

After its pandemic debut in 1817, cholera became the most feared disease of the nineteenth century. Its source, a toxigenic bacterium: *Vibrio cholerae*. There is little coincidence that the prolific and far-reaching spread of this diarrheal scourge emerged during a period of rapid globalization and concentrated along routes of trade, centers of industrialization, and outposts of imperial occupation. In the United States and Europe, the confluence of emerging germ theory, epidemiological science, and racial hierarchies located vibrios in contaminated water and communities contaminated by immigration, destitution, and moral depravity. Identifying the environmental factors promoting *V. cholerae's* transmission spurred many early public health efforts aimed at surveillance, sanitation, and drinking-water infrastructure. As transmission plummeted in the West, the racially-coded presumptions about cholera persisted, becoming a disease of poverty, conflict, and post-disaster—but only in predominantly nonwhite countries. Using the case of the novel 2010-2019 cholera epidemic in Haiti, this article examines the historically mediated co-creation of *V. cholerae's* pathogenicity as situated in a particular and racialized entanglement of microbe and human—the only known natural host for cholera vibrios. Pathogenicity—or a germ's disease-causing potential—hinges on the relationship between microbial virulence and host susceptibility. Drawing on the concept of sociogeny, I consider cholera as a socially produced phenomenon with presumed natural linkages to certain environments and nonwhite populations, and how such narratives in turn shape *vibrio* biologies. Combining the sociogenic principle with STS theorizations of disease, I find that *V. cholerae* carries multiple pathogenicities in relation to human individuals, populations, and nation-states. Centering the microbe as a key actor in the codetermination of its enteric environment highlights its role in humans' negotiations of power.

Keywords

Haiti; cholera; microbe; pathogenicity; sociogeny

Introduction

In October 2010, an eruption of cases presenting with watery diarrhea, vomiting, and profound dehydration swept across the middle of Haiti, tracking from the town of Mibalè downstream along Haiti's most

To cite this article Koski-Karell, Victoria. 2025. "Racism and *Vibrio cholerae*: A Sociogenic Approach to Understanding Pathogenicity." *Engaging Science, Technology, and Society* 11(1): 48–74. https://doi.org/10.17351/ests2023.1529.

To email contact Victoria Koski-Karell: vkoskik@uw.edu.

prominent river, the Artibonite. Patients poured into hospitals and clinics. Some died of fluid depletion within hours of symptom onset. Days into the outbreak, the national laboratory confirmed the etiology of the rapidly spreading disease: toxigenic *Vibrio cholerae*, an aquatic bacterial pathogen transmitted through ingestion of contaminated water or food. Although this proved to be Haiti's first cholera epidemic, it was not the first time vibrios struck horror in the hearts of humans. For much of the nineteenth century, cholera was the most feared disease worldwide as pandemic waves flared along routes of global trade, centers of industrialization, and outposts of imperial occupation, claiming millions of lives. Eventually identified as the causative agent of this deadly scourge in 1884, *V. cholerae* is among those microbes—along with others like smallpox virus and typhoid fever bacteria—that naturally infects only humans. The journey of each infectious vibrio and their evolution across generations therefore embodies an entanglement with humans which forged and maintains its pathogenicity.

The *potential* for a germ to cause disease, or its pathogenicity, hinges on the relationship between microbial virulence and host susceptibility which arise mutually over time. Scholars have made strides in establishing the historical, social, and ecological mediation of human vulnerability to disease. Within the microbe, specific cellular structures, regulatory systems, and molecules are known to furnish the pathogen with its virulence, or ability to cause damage to a host. A biomedical model traditionally considers these two components of pathogenicity separately, with the germ as a fixed entity capable of disrupting human physiology. On the other hand, what centering a microbe like *V. cholerae* makes apparent is the contingency of virulence as well. When we consider the ways inter- and intra-actions among vibrios and with humans' social behaviors, dynamics, and histories influence a germ's severity, the notion of pathogenicity becomes much more complex.

During an interview in 2019, an agriculturalist and cholera survivor in Haiti's Lower Artibonite Valley reflected, "It wasn't the river that made us sick. It was MINUSTAH that allowed cholera to happen in Haiti." Many count MINUSTAH, the militarized United Nations peacekeeping mission operating in Haiti 2004–2017, among a long line of European- and US-orchestrated interventions in the world's first Black-led republic. Centuries of enduring coloniality mediated not only the ways humans carried the pathogen into the country but also the outbreak which ensued. The presence of toxigenic *V. cholerae* in river water, though, does not necessarily mean that cholera will happen. Indeed, these microbes are now considered ubiquitous in aquatic environments nearly worldwide (Domman et al. 2017), yet cases of disease are far less prevalent. Introduce a highly virulent strain through the bodies of UN troops into the social, structural, and susceptible environment of Haiti's Artibonite River and the humans depending on it, however, and you get the most lethal cholera epidemic in recent history.

Theorized by Aníbal Quijano and Michael Ennis (2000), a colonial matrix of power can persist even in the absence of settler colonialism. This "coloniality" manifests through ongoing mechanisms of dispossession and extraction, hegemony, Eurocentric social classification, and European-derived racial hierarchies to advance the consolidation of capital, White supremacism, and the project of the European-modeled nation-state. In the quest for control of economy, authority, social reproduction, and knowledge, the modern colonial system subjects both humans and ecosystems to precarity, structural violence, and harm worldwide (Mignolo 2007). Central to the colonial matrix of power is an organized social system, "... in which the dominant racial group, based on an ideology of inferiority, categorizes and ranks people into

social groups called 'races'" (Williams et al. 2019, 106). This system operates not only through individual acts of prejudice or discrimination, but also conditions and institutional structures with "distinct yet densely interconnected political geographies" (Gilmore 2002, 261). Across borders and decades, the history of *V. cholerae's* infectious entanglements with its human hosts demonstrates the key role racism plays in generating the pathogen's epidemic potential. The "codetermination of the organism and its environment" also means that they "coevolve" (Lewontin and Levins 2007, 183). With the human gut as their primary environment outside of aquatic reservoirs, vibrio infections/species invite us to examine the ways this microbe participates in humans' dominant system of race relations.

To understand the interaction between the microbe and its co-evolutionary environments, I specifically use a sociogenic approach as developed by Caribbean social philosophers to expand upon foundational STS theorizations of disease and the role of microorganisms as social actors (see Latour 1988). Sociogeny helps us to understand cholera as enactments of *V. cholerae* pathogenicity, and pathogenicity as a social phenomenon with narratives reciprocally influencing biologies of both humans and vibrios. In Haiti, the racism intrinsic to coloniality actualized the potential of toxigenic *V. cholera* to provoke multiple pathogenicities: disease, epidemic, and geopolitical scandal. A sociogenic approach moves beyond the universalizing conceptualization of social constructivism to recognize the important and particular role of coloniality in projecting, harnessing, and expanding a "human/subhuman distinction" based on race (Wynter 2003, 264). Over the following pages, I explore how racism skewed ideas about *V. cholerae's* endemicity in Haiti and thereby disavowed the ways imperial incursions contributed to its virulence; how the modern colonial system structured vulnerability favoring vibrios' epidemic spread; and how institutionalized and personally mediated racism made *V. cholerae* a vehicle for reasserting racial-colonial power over Haitians. In so doing, I tackle several pathogenic assumptions about Haiti's cholera history, Haitians' inherent susceptibility to disease transmission, and the UN's so-called "absolute immunity" from legal process.

Grounding this article is more than a decade of research into the novel 2010–2019 Haiti cholera epidemic, which involved an aggregated two years of ethnographic fieldwork in the north, center, and Artibonite regions of the country. I gathered data using combined methods of interviews, participant-observation in clinics and cholera treatment centers, quantitative surveys of household water consumption, photovoice prompts (Wang and Burris 1997), and analysis of primary sources, including multilateral project reports, print and radio news, UN agency records and factsheets, Haiti Ministry of Health cholera updates, and US government documents. Conversations with study participants in a variety of settings and across socioeconomic classes provided details on the lived experiences of Haitian cholera survivors, caregivers, farmers, students, politicians, professionals, religious leaders, and international humanitarian workers. By centering the vibrios that entwine them, this work pushes the field of STS toward a more nuanced critique of the connection between racism and health historically and relationally, including with the microbes that co-create and sometimes infect us.

Vibrio cholerae and the Sociogenic Principle

Swift investigation of the initial cholera cases in 2010 led Haitian community members to a camp of recently arrived Nepali UN troops stationed at a MINUSTAH base adjacent a widely-used tributary of the Artibonite

River. At the time, about half of Haiti's rural population had access to an improved water source, but a majority still depended on surface water for domestic uses in addition to drinking (WHO and UNICEF 2021). Facing insufficient funding and poor oversight of environmental protection, MINUSTAH forces at the camp disposed of contaminated fecal waste into open septic drains and pits flowing directly into the tributary (Cravioto et al. 2011). Ingestion of vibrios from this water led to a proliferation of cases among downstream communities. Although genomic studies later confirmed that the strain of *V. cholerae* behind the outbreak matched those present in Nepal (Hendriksen et al. 2011), the UN denied any role in introducing the disease. In a matter of weeks, cholera engulfed the entire country, marking the first epidemic of the disease in Haiti's history (Jenson et al. 2011).

Within the first three years, *V. cholerae* infected 690,000 individuals and claimed 8,500 lives (PAHO and WHO 2013). These official figures, however, likely underestimate the real toll. Researchers calculate that three to ten times as many Haitians fell victim to cholera, especially in rural areas of the country where individuals faced significant barriers in accessing safe water and medical treatment (Jackson et al. 2013; Luquero et al. 2016; Gladstone 2016). The 2010–2019 Haiti cholera epidemic eventually became the deadliest in recent world history, with nearly 10,000 recorded fatalities (Lee et al. 2020).

Much of the scholarship on cholera in Haiti and elsewhere uses the epidemic as a prism to reveal the historically deep, geographically broad, and locally specific dimensions of the settings in which it arises. Paul Farmer honed this approach through his work on the disparate burdens of infectious diseases, including the 2010 Haiti cholera epidemic (2011), and inspired many others in the same—see Jonathan Katz (2013) and Ralph Frerichs (2016) on cholera in Haiti, Mark Harrison (2020) on cholera in India, and Simukai Chigudu (2020) on cholera in Zimbabwe. Common to this literature is a premise equating *V. cholerae* to cholera-as-disease, or a manifestation of biological dysfunction whose burden is distributed along fault lines of historically rooted inequities, including racism. For these and other scholars, disease is not simply a natural occurrence, nor is race a biological construct reflecting innate differences. Instead, as Nancy Krieger develops in her ecosocial theory of disease distribution, health inequities must be considered "in relation to power, levels, life course, historical generation, biology, and ecosystems" (2020, 45). Differences in disease outcomes, according to Camara Jones (1994, 2000) and others, are due to effects of social systems based on domination and privilege, which span institutionalized, personally mediated, and internalized social constructions of race.

In a similar approach, other authors demonstrate how cholera marks the contours of coloniality. Warwick Anderson (2006), for example, considers how the "civilizing" project of hygiene reform in colonial Philippines was simultaneously used as a technology for disease management, a mechanism of empire, and an opportunity to discipline both Filipinos and Americans in social and biological racism. Similar strategies are found to continue in postcolonial settings as well. Anthropologists Charles Briggs and Clara Mantini-Briggs (2003) document how racism shaped narratives of blame amid the Venezuela cholera epidemic in the early 1990s. These authors laid the groundwork for understanding how cholera-as-problem invites the application of racial essentialism as a strategic tool for organizing and controlling populations, as well as the use of race as a technology productive of claims for equity, human rights, and social justice (c.f. Lentin 2020). This approach helps to answer the question of how race is "constructed sociogenically" by thinking about "what race does" (Lentin 2022). What these authors did not consider, however, are the ways multiple

species are involved. In this article, I argue that *V. cholerae*—a micro-organism, transmissible agent, bacterial species, and living entity filled with potential—is recurrently and reciprocally entwined in the unfolding sociogenesis of race. While infectious diseases like cholera provide "biological *expression* of social inequalities" (Farmer 2001, 262, emphasis added), vibrios and other pathogens are actively entangled in humans' negotiations of power, particularly along invented racial hierarchies.

Within a biomedical model, cholera exists, as Annemarie Mol (2002) would describe, in "multiple ontologies" simultaneously: as enactments of symptoms, pathophysiology, microbe, and public health crisis. This manifoldness of cholera hangs together in the situated coordination of knowledge, objects, and practice. As the disease-causing bacterium, *V. cholerae* and its relations to body, health system, and human society are elements of the same cholera assemblage. Analysis of its potential to cause disease in the first place, however, calls for an approach that can parse the interactions between pathogen and host contributing to their mutual production. While Mol's notion of multiplicity conceptualizes the ways such objects as body, disease, and pathogen exist as enactments of the practices which produce them, it falls short of accounting for racism in mediating their manifestations. With race as center to the modern colonial world system (Quijano 2000), the pathogenicities of *V. cholerae* cannot be understood without considering the relationship between racism and cholera-as-assemblage, just as racism emerges as property of human-vibrio entanglement.

Sylvia Wynter (2001) develops her theory of the "sociogenic principle" drawing from Frantz Fanon's concept of sociogeny. In *Black Skin, White Masks*, Fanon ([1952] 2008) grapples with the implications of the experience of being Black in a world where whiteness is the privileged category. To this day exist assumptions that differences between races are both intrinsic to the humans in each category, and that the categories themselves derive from natural processes separating them. Fanon argues instead that the human condition derives from social processes at the level of the species and individual as well as from discourse generated within culturally specific and historically contingent contexts. Beside phylogeny, which explains divergence through species level origins, and ontogeny, where variance emerges through the development of an individual over their lifetime, he proposes sociogeny, or the social production of the organism (ibid., xv).

The Euro- and white-centric model of race informing most social, economic, and political dynamics worldwide emerges from a particular intersubjective social imaginary rooted in a system of racial-colonial rule. By showing how enactments of colonialism's enduring structures and racial project create the conditions of being Black, Fanon reveals the arbitrariness of the Black-white binary as well as its devastating effects. The invention of race, he argues, engenders both self-understanding and psychological distress, thus shaping human consciousness. Yet biology, according to Fanon, remains evolutionarily determined (ibid.). Wynter's theorization of the sociogenic principle extends sociogeny further to show how the social and the cultural dimensions of racism also influence the idea, materiality, and assemblage of human biology. Underscoring relationality and interhuman narratives, Wynter asserts that socially constructed meaning

systems condition "*the terms in which*" human physiological processes[1] will be activated (Wynter in Scott 2000, 189, emphasis in original). Ultimately, human biology is neither a universal objective truth nor pre-determined, but instead hinges upon particular and historically contingent socio-cultural frameworks. The cholera epidemic which tore through Haiti lays bare how human sociogenesis links intrinsically and interstitially with that of microbes like *V. cholerae*.

Vibrios, Racism, and the Making of an Imperial Affliction

In the wake of the 2010 cholera outbreak, investigators and reporters attempted to historically situate the presence of the disease in Haiti. Without citing any clear evidence, claims circulated that cholera had appeared in the country for the first time in 50–100 years. Despite data indicating that *V. cholerae* was "newly introduced into Haiti" in 2010 (Dowell and Braden 2011), the assumption endured. That cholera was thus far absent from Haiti—a Black nation plagued by ahistorical renderings of misfortune—seemed impossible to imagine. As a social phenomenon, the disease-causing potential of *V. cholerae* became linked to Haitians as if they were naturally predisposed to its pathogenicity. In this section, I show how racism mediates such assumptions and relate it to the broader history of how racism shaped the pathogen's transmission and virulence through interactions between humans and vibrios.

Not all *V. cholerae* are virulent enough to cause cholera. Of the 200 types of *V. cholerae* bacteria, only those strains belonging to the O1 or O139 serogroups have the capacity to provoke severe cholera symptoms and epidemics of the disease. This is because they contain genes which produce cholera toxin, the microbe's key virulence factor. The genes encoding cholera toxin get activated as vibrios enter the small bowel, causing them to secrete the toxin molecule onto the cells of the intestine. Once absorbed into the cell, the toxin sets off a cascade of enzymatic activity that leads to an efflux of electrolytes into the gut (Subramanya et al. 2007). With the increasing concentration of ions outside of the cell, water follows, drawn by osmosis. Water, ions, and vibrios spill through the bowel, rapidly exiting the body as diarrhea severe enough to kill within hours.

Throughout history, imperialism has favored the spread of cholera. Although toxigenic *V. cholerae* variants have existed for centuries—with descriptions of afflictions closely resembling cholera found in Sanskrit dating back to the fifth-century BC (Harris et al. 2012)—their pathogenicity was geographically limited to outbreaks of disease in the Bengal Delta of South Asia. At the confluence of the Ganges and Brahmaputra Rivers, this region forms the largest delta in the world. While the river and estuarine waterscape supplied an aquatic reservoir and means of transmission for toxigenic vibrios, a sociogenic approach turns our attention to the social forces that enabled their spread. The year 1817 marked what was "probably the most terrible of Indian cholera epidemics" and the beginning of the first of seven cholera pandemics in history (Rogers 1928, 8). Behind each pandemic of cholera has been a microbial strain whose pathogenicity outstripped the ones previous. With each disease outbreak, toxigenic vibrio bacteria

[1] Wynter is herself most concerned with the process of "neural firings" of consciousness.

proliferate in that environment and population, facing the pressures of natural selection from within and outside of human hosts.

In contrast to longstanding narratives emphasizing the extracorporeal milieu, emerging science demonstrates how the conditions within the bowel serve as the primary driver of *V. cholerae* replication and evolution. Vibrio colonies undergo explosive growth amid the nutrient dense enteric environment, where they encounter, compete, and exchange genetic information with gut microbiota (Cho et al. 2021). As one research group notes, "selection in the mammalian intestine can cause enrichment of environmental strains with virulence potential" (Faruque et al. 2004). Interactions between humans and vibrios affect not only their epidemiology but also play the key role in their pathogenicity. In the mutual creation of *V. cholerae* and human organisms, the microbe's phylogenetic derivations exist alongside its sociogenic ones. While impossible to determine the exact microscopic circumstances that led to the acquisition of the virulence factors permitting its new pandemic potential, *V. cholerae*'s ability to cause such explosive disease was just as contingent on the physiologic and social milieu of its hosts: most importantly, that engendered by Western imperialism.

In 1765, as France enforced a brutal plantation economy to make Saint-Domingue (now Haiti) the most lucrative colony in the world (Dupuy 2007, 6–7), the English East India Company took control of Bengal. Accompanying the administrative, economic, social, and environmental turbulence that ensued was the increased movement of troops and migrant laborers throughout the South Asian region. As the East India Company expanded its territorial power during the two decades leading up to the 1817 outbreak, small epidemics of symptoms consistent with cholera occurred intermittently among towns and villages in Bengal, often associated with the arrival of soldiers. The "connection between cholera and conquest" marks the heart of *V. cholerae* pathogenicity (Arnold 1986, 126). Subject to the insanitary and crowded conditions of colonial barracks and encampments, troops were particularly susceptible to infection: "and they, in turn, were among the principal agencies by which the disease was disseminated throughout India" (ibid.). Over the next six years, cholera cases were recorded as far east as Indonesia and Japan and as far west as the Persian Gulf and Tanzania.

Inside the body, toxigenic *V. cholerae* induces symptoms of severe dehydration. Among the effects of such massive fluid loss was one presentation that particularly horrified nineteenth-century observers: darkening of the skin. Popular medical and satiric illustrations of the time involved depictions of cholera's visceral and racial associations as well as "its most visible symptom: the body turned blue" (Sciampacone 2022, 356). In some medical accounts circulating in the United Kingdom and the United States at the time, physicians describe how in cases of cholera "the skin assumes a blue or blackish hue, which is almost general; the nails become livid and almost black" (Tardieu 1849 in O'Connor 2000, 43). "Look at the skin," writes an American doctor, "and you might almost imagine you have an Ethiopian" (Jameson 1855 in O'Connor 44). As the disease entwined with a medical model grounded in racial discourse, fears of cholera coalesced around its potential to infect victims not only with a Black phenotype but a Black bloodline. By transfiguring victims into "the image of the exotic Other, Asiatic cholera suggested a series of affinities between poverty and primitivism" (ibid., 44). That cholera vibrios threatened Euro-Americans with not just death but degeneration demonstrates how *V. cholerae* contributed to the creation and reinforcement of racial categories entangled as well with socioeconomic ones.

The sudden transition from local outbreaks in the Bengal Delta to transcontinental spread paralleled the expansion of European imperialism and global capitalism. A second and longer lasting cholera pandemic began in 1829, affecting populations across Asia, Europe, Africa, the Americas, and parts of the Caribbean, except Haiti. For 22 years, this *V. cholerae* strain circulated in epidemics involving such heavy casualties that mass burials became common around the world (Barua 1992, 10). Tracking along routes of travel, pilgrimage, conquest, and trade, three more cholera pandemics swept much—though not all—of the globe before the close of the nineteenth century; a sixth lasted for the first 23 years of the twentieth century; and the seventh, which began in 1961, continues to this day (Nair and Takeda 2014). Inter-pandemic years were also marked with large outbreaks, such as the 1947 epidemic in Egypt, where staggering losses of over 10,000 deaths were reported in the Nile Valley (Echenberg 2011).

In nineteenth-century Europe and North America, cholera struck crowded urban working-class and otherwise destitute populations almost exclusively. To many spared observers, those residing and falling ill in cholera-prone locations seemed less than human. Physician-turned-novelist William A. Caruthers rendered a scene from New York City's Five Points neighborhood—an area historically named the city's original "Little Africa"—at the height of a cholera epidemic:

> I can scarcely give you an idea of the wretched condition of these tatterdemalions, by anything which you have seen in the South. They are far more filthy, degraded, and wretched than any slave I have ever beheld (1834, 28).

Hospitals overflowed and piles of coffins lined the streets, the horrified narrator recounts. Cholera, and especially its propensity for the most vulnerable, brought the Western economy to a standstill. Motivations to implement sanitation reforms and expand water infrastructure in these settings were as biopolitical as they were morally and racially charged (Rosenberg [1962] 1987). By 1925, cholera transmission was effectively eliminated from the West. The twentieth-century narratives that followed and persist relegate toxigenic *V. cholerae*'s natural habitat to the predominantly nonwhite Global South—much of which had been or was at the time under colonial rule.

That epidemics continued in places like South and Southeast Asia, West Asia, and Africa conveniently aligned cholera with the emerging classification of "tropical infectious diseases." Imagining cholera's natural domain as "tropical" preserves these settings in the colonial imaginary as ever in need of domination. As Fanon writes, "colonization has succeeded only once this untamed nature has been brought under control" ([1961] 2004, 182). Reducing cholera's epidemiology to its geographic (and implicitly racialized) distribution perpetuates the racist conflation of poverty and primitivism and serves to disavow the social forces and structural vulnerability allowing outbreaks to recur in these settings. Colonialism, the plantation economy, and global capitalism not only furnished Western powers with the means to end cholera transmission among their own populations but wrought the ecological and social transformations that allowed cholera to thrive elsewhere. With pathogenicity contingent on a microbe's virulence and a host's susceptibility, the relation between *V. cholerae* and coloniality also becomes pathogenic.

After decades of resistance against French colonial rule and institutionalized slavery, the subjugated peoples of Saint-Domingue launched an insurrection that catalyzed one of the most revolutionary achievements in history: the independence in 1804 of the sovereign state of Haiti, the world's

first Black republic. As a sovereign and self-proclaimed Black nation (Dessalines 1805), Haiti "struck a direct blow at the ontological foundations of white supremacy and, by its very existence, at the colonial foundations of the Atlantic colonial order" (Fick 2009, 185). In response, France was joined by the United States and allied European powers in orchestrating a diplomatic quarantine that actively denied the "rebel slaves" of Haiti the rights, privileges, and respect granted to other modern nation states (Farmer 1992, 169).[2] With the abolition of plantation slavery and colonial occupation, the country remained relatively free of populations concentrated in close and insanitary conditions. This proved to be only one of Haiti's protective factors against cholera pandemics which would soon sweep the globe. Amidst several major cholera outbreaks affecting the Americas and much of the Caribbean between 1833–1872, Haiti's government took strict measures at its ports and borders to prevent introduction of the contagion (Jenson et al. 2011, 2133–4). Even when an epidemic struck the neighboring Dominican Republic in late 1867, Haiti instituted a policy of quarantining ships from the eastern side of the island and successfully averted its spread (ibid.). Without newly arriving foreign troops or enslaved captives entering the country, Haiti avoided the importation of toxigenic vibrios from elsewhere. Through an exhaustive review of nineteenth-century medical journals and other sources, Deborah Jenson and her team at Duke University (ibid.) found no evidence that cholera occurred in Haiti before seventh-pandemic *V. cholerae* entered the country in 2010. To claim otherwise is not only false but perpetuates a narrative that disavows both Haiti's agency and the sociogenesis that made cholera an imperial affliction.

Social Production of an Epidemic Disaster

The *V. cholerae* variant brought into Haiti in 2010 was a particularly virulent strain. Carrying genes that increase its motility, production of cholera toxin, and ability to colonize a host, this microbe had the capacity to induce prolonged symptoms of diarrhea. By lingering inside the gut, these specific vibrios caused a more intensely dehydrating disease while also extending time for their replication within a host, thus enhancing their likelihood of spreading to other humans. Combined, such traits conferred a synergism of increased severity and transmissibility. Yet susceptibility to *V. cholerae's* disease-producing power was not evenly distributed, nor in ways fully explained by the pathogen's virulence alone. The microbe, for example, was expected to explode among the massive, crowded camps of persons displaced by the January 2010 earthquake in Port-au-Prince. Compared to rates of transmission in the provinces, however, relatively low numbers of cholera infections took place, given their easier access to potable water and sanitation often provided by outside humanitarian relief organizations (Piarroux et al. 2011). In another instance, many experts attributed the severity of the outbreak to Haiti's "immunologically naïve" population (Cravioto et al. 2011). But encounters between the pathogen and other similarly susceptible "naïve" hosts in the

[2] Commercial isolation, on the other hand, did not follow. Within years of its independence, Haiti became a major trade partner with the United States, Britain, and other nations, despite periods of embargo aimed at strangling its economy lest its success inspire slave revolts back home.

Dominican Republic and Florida, where residents are protected from waterborne contamination by physical and chemical barriers, failed to generate the same disaster.

During periods of fieldwork in 2017 and 2018, I interviewed and accompanied Edmond—a fictitious name used to protect his identity. Edmond had served as one of several municipal officials in the central Haiti town of Mibalè during the initial years of the 2010 epidemic. At the time when toxigenic *V. cholerae* entered a tributary upstream from Mibalè, an estimated 69% of the country's population had access to improved drinking-water and 17% had access to improved sanitation (WHO and UNICEF 2021, 45). Compared to urban settings, these figures dropped in rural areas to 51% and 10%, respectively. "Outside of city areas, there are hardly any latrines," Edmond explained. "Neither treated water nor health centers. Most people drink water from springs. But when it rains, the springs get contaminated because they are not protected [with infrastructure]. When cholera started, people were dying so fast. Some made it to the hospital. Some couldn't because there were no means of transportation from their remote villages. Others died along the way, and their deaths went unrecorded." In contrast to urban outbreaks of nineteenth-century Europe and North America and twenty-first-century ones like that in Zimbabwe (Chigudu 2020), cholera in Haiti became a disease of the rural poor (Guillaume et al. 2019). Each cholera epidemic "has its own characteristics, its own distinctive relationship with human ecology" (Arnold 1986, 119). *V. cholerae's* presence in Haiti foregrounds the social and structural factors that contributed to its spread and linked its epidemic-causing potential inextricably to the racism of coloniality.

By the mid-nineteenth century, France had benefitted from three hundred years of colonial rule over lands spread across the Caribbean, North America, and parts of South America and Asia. Under the ruthless control of la Métropole, the colony of Saint-Domingue became one of the most profitable colonies in the world. Yet hardly any of that wealth was invested back into the long-term infrastructures of the island or into the long-term wellbeing of its majority enslaved, majority Black population. As Sidney Mintz (1989, 44) writes, "the 'economic development' of the [Caribbean] islands was largely responsible for their 'underdevelopment' at a later time." The French economic exploitation of Haiti continued even after its hard-won independence in 1804. Facing persistent threats of French reinvasion and war, President Jean-Pierre Boyer agreed in 1825 to pay an indemnity to France in exchange for diplomatic recognition (Dubois 2012, 97–101). France forced Haiti to pay 150 million francs for its lost "properties"—referring in part to the humans it had enslaved—by taking out a loan with an 80% interest rate from its former colonial ruler (United States Congress 1922). While this figure was later reduced to 90 million francs in 1838, the total debt plus interest that Haiti eventually finished paying France in 1947 amounted to $21 billion in today's dollars (Gamio et al. 2022). While France was financially equipped to build public health systems in response to nineteenth-century cholera epidemics, Haiti was left with almost nothing at its disposal for infrastructural development. Among other things, the modernization of France's water and sanitation infrastructure was and remains a process linked to wealth extracted from colonized territories, capital accumulated through the plantation economy, and lives, labor, and cultures stolen from enslaved Amerindians and Africans (Galeano 1973; Robinson 1983; Mintz 1989).

As France continued to intervene in Haiti's political and economic affairs throughout the nineteenth century, the early-twentieth century marked instead a recurrence of colonial occupation. On the orders of President Woodrow Wilson, the US Marines invaded Haiti in July 1915 with the reported intent to restore

order following the assassination of President Jean Vilbrun Guillaume Sam, establish democratic governance, and place Haitian society on the path to modernization. Underpinning the alleged humanitarian grounds of the mission were both geopolitical motivations and national strategic interests as well as a racialized notion of development (Minn 2011; Renda 2001). At the heart of Wilson's liberalism was a form of domination and paternalism by which the responsibility of reforming Haiti's economy, government, and culture rested with "enterprising white men based on their unique heritage of justice, liberty, and democracy" (Shah 2009, 26). The burden of "civilizing" the Black Republic legitimized forms of violence that included but were not limited to village burnings, religious intolerance, the reintroduction of forced labor, torture, sexual assault, and the killing of 15,000 Haitians (Danticat 2015). Haiti endured the Occupation until 1934.

Following the US Marines' departure ensued decades of social, political, economic, and environmental turmoil, a 29-year autocratic family dictatorship, and escalating foreign interference. By 1993, the UN carried out the first of six military-police operations over ten years billed as peacekeeping missions (UNSC 2022). All were predominantly funded by the US government and consisted of uniformed personnel from middle-income—and predominantly Black and brown—countries, as is the case for all twenty-first century UN missions (Bellamy and Williams 2013, 2). MINUSTAH, the mission in place when the cholera epidemic began, was established in 2004 amid a period of escalating insecurity following the US-orchestrated ouster of President Jean-Bertrand Aristide. Having deemed the situation in Haiti a threat to peace and security in the region, the UN deployed an initial 8,000-strong force of international police and military components to fulfill the mission's mandate: "to restore a secure and stable environment, to promote the political process, to strengthen Haiti's Government institutions and rule-of-law-structures, as well as to promote and to protect human rights" (UN Peacekeeping 2021). The motivation behind a UN-led force was also financial. In a 2006 report comparing the cost of UN operations in Haiti to a hypothetical US-led scenario, the US Government Accountability Office estimated that it would cost the US twice as much as the UN to conduct its own peacekeeping mission. One substantial difference entailed the amount of funding for facilities: the US would need to spend about $208 million for what the UN budgeted at $100 million (GAO 2006, 3). The US government decided to keep the operation in UN hands, while maintaining lead as the single largest financial contributor (U.S. Library of Congress 2024).

By 2009, MINUSTAH comprised more than 9,000 soldiers and police officers from 47 countries living on bases throughout Haiti (UN 2009). Following the 7.0 magnitude earthquake that struck Leogane and Port-au-Prince on January 12, 2010, killing an estimated 220,000–300,000 people and leaving more than 1.3 million displaced, the UN ranks rose to about 13,000 (UNDL 2010). Two months later, the US Centers for Disease Control released a post-earthquake brief concerning the likelihood of an ensuing cholera epidemic. With the absence of toxigenic *V. cholerae* in Haiti, the CDC noted, "an outbreak of cholera is very unlikely at this time" (CDC Archive 2010). The CDC further explained that the introduction of cholera into Haiti was low because relief workers are "likely to have access to adequate hygiene and sanitation facilities within Haiti, such that any cholera organisms they import would be safely contained" (ibid.). And yet,

> . . .influxes of international soldiers from cholera-endemic areas, who lived in barracks-style housing, present[ed] an unexpected parallel to the nineteenth-century risk factor of new colonial enslaved or military populations living in crowded conditions" (Jenson et al. 2011, 2134).

Structural vulnerabilities conditioned by racial-colonial systems made Haitians, especially those in rural areas or otherwise facing limited access to safe drinking-water, susceptible to *V. cholerae* infection.

With the first cases of cholera in October 2010, investigators traced the source of the outbreak to a tributary flowing beside a camp of Nepali UN troops. When reporters followed up, they filmed UN soldiers shoveling what looked like a sewage spill, observed an overflowing septic tank, and discovered a landfill upstream from where members of the community bathed (*Al Jazeera* 2010). Earlier that month a cholera outbreak had struck Nepal, where the pathogen is endemic (Sérant 2010). In keeping with UN protocol, the peacekeepers had not been screened for infection before arriving in Haiti. When these carriers began shedding vibrios in their stool, the camp's underfunded and poorly-managed facilities failed to prevent toxigenic *V. cholerae* from entering Haiti's waters. Mediating between humans and the historically-situated production of an epidemic disaster, the microbe became pathogenic with the virulence of coloniality.

For decades, a prevailing theory about cholera epidemics outside of South Asia held that outbreaks derive from local aquatic vibrio reservoirs, triggered into eruptions of transmission by environmental events. In the wake of the 2010 Haiti cholera outbreak, a team of US researchers proposed that a so-called "perfect storm" of three converging "natural" phenomena—an earthquake, a heat wave, and a passing hurricane—churned Haiti's river systems into the ideal environment for local non-toxigenic vibrios to thrive, replicate, and acquire virulence (Hasan et al. 2012).[3] Extensive whole-genome sequencing of the *V. cholerae* isolate behind the Haiti epidemic, however, definitively proved otherwise: the strain matched that from Nepal identically (Hendriksen et al. 2011).

The ongoing seventh cholera pandemic involves a *V. cholerae* variant of the O1 El Tor biotype, which differs from the O1 classical biotype of previous pandemics (Zhang et al. 2014). High-resolution phylogenic mapping of hundreds of isolates from cholera epidemics around the world links all seventh pandemic vibrios to a common *V. cholerae* population in South Asia which has generated three distinct but overlapping waves of transmission (Mutreja et al. 2011; Domman et al. 2017). Similar to Haiti, studies show that cholera outbreaks which occurred in Latin America (ibid.), Africa (Weill et al. 2017), and Europe (Oprea et al. 2020) since 1970, each resulted from intercontinental introductions of an O1 El Tor *V. cholerae* variant, rather than local emergence. In bringing attention to "the role that humans play in the long-term spread and maintenance of the pathogen, whether by direct (human-to-human) or indirect (pollution of the environment with feces from cholera patients) transmission" (Weill et al. 2017, 789), these findings bolster

[3] While this theory proposed that three 'natural disasters' prompted the Haiti cholera epidemic, the disasters themselves were far from 'natural'. Decades of disinvestment from public works, the agricultural sector, safe housing in Haiti, along with rapid urbanization (due to surplus labor from rural areas) and environmental erosion (due to poverty-driven practices), contributed to making these events' disasters. Moreover, hurricanes and heat waves are becoming more intense, frequent, and destructive due to anthropogenic causes of climate change.

a sociogenic approach to cholera in Haiti. Linking the epidemic potential of *V. cholerae* in nineteenth-century India to twenty-first-century Haiti is a racialized colonial matrix of power shaping biologies of both humans and microbes.

Making Visible a Geopolitical Scandal

In the years leading up to the 2010 cholera epidemic, Haitian citizens and international allies had been calling for an end to the UN peacekeeping mission. The MINUSTAH occupation, advocates claimed, not only infringed on Haiti's sovereignty but also violated Haitians' human rights (Kolbe and Hutson 2006). With the link between MINUSTAH and toxigenic *V. cholerae* incontrovertible, the microbe became another means by which Haitians asserted their rights on the global stage. While interactions between humans and vibrios fostered attempts to abolish the coloniality undergirding disease- and epidemic-causing potential, anti-Black racism suffused the geopolitical scandal of the UN's response. Racism often operates invisibly and implicitly, yet remains almost always palpable by its subjects—felt in both what is and is not present or happening. A sociogenic approach to *V. cholerae* pathogenicity makes visible not only the structural and historical racism that mediated the Haiti cholera epidemic, but also enactments of racism from the interpersonal to the institutional that work to disenfranchise, dehumanize, and galvanize.

In November 2011, the Institute for Justice and Democracy in Haiti (IJDH), a US-based legal advocacy organization, and its Haitian partner entity, the Bureau des Avocats Internationaux (BAI), filed claims against the UN on behalf of 5,000 Haitian cholera victims. Together, they petitioned for:

1. investments in water and sanitation infrastructure to combat the epidemic,
2. just compensation,
3. and, a public acceptance of responsibility (BAI–IJDH 2018).

In February 2013, the UN finally responded, tersely dismissing the claims as "not receivable" (IHRC–HLS and BAI–IJDH 2020, 15). It offered no explanation as to "how the injuries suffered by Haitians differed from others the UN has compensated as a matter of course in the past" (Houston 2017). As the physical and psychosocial toll of the epidemic mounted, the UN continued to disregard the grievances of those harmed by cholera. Starting in October 2013, IJDH and BAI filed the first of several lawsuits against the UN and MINUSTAH in US federal court. These legal actions disputed the viability of the UN's absolute immunity and its breached obligation to recognize and provide a forum for the claims of Haitian citizens. Despite multiple attempts to advance the suit, the UN's assertations of immunity prevailed. The legal process ended in October 2019 when the US Supreme Court declined to review the case (IHRC–HLS and BAI–IJDH 2020, 16).

The UN did not simply deny involvement in the outbreak but also diffused responsibility, obfuscated available scientific evidence, and delegitimized Haitians' demands for accountability by naturalizing Haiti as a site for cholera (ibid., 31). Often cited, for instance, was a 2011 study by its hand-picked group of international experts. Though indicating *V. cholerae* likely originated from the Nepali MINUSTAH base, the panel declared that the epidemic "was not the fault of, or deliberate action of, a group or individual," arguing instead that "the introduction of this cholera strain as a result of environmental contamination with feces could not have been the source of such an outbreak without simultaneous water and sanitation and health care system deficiencies" (Cravioto et al. 2011, 4). In this thinking, nothing could have prevented the

epidemic at the time. Some of these experts later publicly changed their minds to call out the UN explicitly and support accountability (Sontag 2012). While the structural racism of coloniality shapes pathogenicity, a sociogenic approach also highlights the role of actions and interactions at the scales of organizations and individuals.

Not until December 2016 did Secretary-General Ban Ki-moon deliver a public apology on behalf of the UN: "We simply did not do enough with regard to the cholera outbreak and its spread in Haiti. We are profoundly sorry for our role" (2016). While sidestepping any legal responsibility, the Secretary-General acknowledged a "moral responsibility to act" and launched a $400 million initiative to assist in eliminating cholera and supporting those Haitians most directly affected. By the time of announcing this New Approach to Cholera in Haiti, member states had only contributed 18% of the $2.2 billion needed for the existing 10-year national plan to eliminate cholera (Alston et al. 2020). In contrast, the UN had secured $4 billion for MINUSTAH's operations from 2010–2016, despite the lack of any threat to international peace to justify that mission (Esquivel et al. 2017). Meanwhile, more than 10% of MINUSTAH's several dozen bases around Haiti continued to dispose fecal waste directly into the local environment between 2011 to 2015 (Clarke and Pilkington 2016; UN OIOS 2015).

The long overdue apology and promise of material assistance came at great relief to many in Haiti. One community representative and Vodou priest in Mibalè celebrated that there may finally be justice. "The victims of cholera should receive help from the international community," he said during a 2017 interview. Although he himself never fell ill, he had used his truck to transport many cholera victims in his rural area to the hospital.

> Because of the way that people died, let alone with the stigma attached to the disease for those who got sick, those people should be compensated for what they had to endure and for the contamination of their environment. Haiti has been treated as though it's a big garbage container where people can come from everywhere to throw their trash. Here in Mibalè, where cholera started, the community is due reparations.

Much about Haitians' responses to the cholera epidemic depended on the social, political, cultural, and historical context in which it occurred. It was as much against the UN as against the epidemic itself that the populace reacted. By starting from the microbe, we can trace the social forces, structures, and meanings that conditioned its potential entanglements with humans. In addition to mediating its disease- and epidemic-causing properties, racism shaped the pathogenicity of toxigenic *V. cholerae* in Haiti to engender scientific investigations, legal action, demands for justice, material resources, and institutional reckonings.

Throughout the epidemic, Edmond, the elected official in Mibalè, played a critical role in tracing the source of cholera to the UN base, coordinating response to the disaster, advocating for his fellow community members, and interfacing with international organizations and donors—most of whom would be considered *blan*, a Haitian Kreyòl word indicating white people and/or non-Haitians. This also involved him enduring the strain of institutionalized and interpersonal racism. He described during our first interview in 2017,

> I've been receiving *blan* about cholera since 2011. It got to a point where I started feeling tired of meeting with representatives of international groups like UNICEF and USAID. Cholera is devastating the nation. Lots of people are getting killed. Then *blan* from these organizations come to do investigations. People are dying, and they're doing studies. There is never any continuity or solution. It's like they're teasing us. It

> is an injustice. Say it louder: it's unfair! I believe that *blan* take us for nothing. The ones giving help are not doing so for *our* good. They are helping for their own advantage and interests.

Edmond's experiences expose the racism intrinsic to and perpetuated by coloniality. Despite his position as a leader and representative of his community, he encountered differential access to decision-making and information. Rather, power and control of resources remained firmly in the white-dominated institutions of Europe and North America. The presence of toxigenic *V. cholerae* in Haiti exacerbated not only institutionalized racism but also the personally-mediated racism Edmond and many others faced in its wake: from racialized assumptions about abilities, to the numerous top-down Euro-American driven water and sanitation "social engineering" campaigns, to outright devaluation, suspicion, and lack of respect.

A month before the Secretary-General introduced the New Approach, a UN Special Advisor shared aims to dedicate $100 million of the funds for payments to families of more than 9,300 cholera victims in Haiti (Nichols 2016). Providing some $10,000 per family would serve as a "tangible expression" of the UN's regret for the suffering of the Haitian people. For years, direct compensation had been a cornerstone of Haitians' calls for reparations in the wake of the epidemic (IHRC–HLS and BAI–IJDH 2020). As "a central component of the right to an effective remedy," compensation was warranted for the specific, quantifiable household level damages victims not simply endured but identified as the most severe impact of cholera (Alston et al. 2020). When the details of the New Approach were finalized, however, mention of direct compensation was entirely absent. In addition to efforts to implement short- and longer-term improvements in water, sanitation, and health systems, the UN opted instead for an expression of regret that was not just "tangible" but "concrete": several piece-meal "package[s] of material assistance" in the form of community infrastructure projects deemed cost-effective (UNDL 2016). Yet such "development programmes are not reparation programmes, for they do not target victims specifically and their aim is to satisfy basic and urgent needs to which beneficiaries have a right as citizens, not necessarily as victims" (UNDL 2014). Ultimately, the New Approach came to function as "an act of charity" rather than the fulfillment of a legal duty (Alston in Walker 2016), and an underfunded one at that. At the writing of this article, the UN has secured less than $22 million of the $400 million intended (UN MTPFO 2016).

With these substantial funding limitations, the packages of material assistance became "construction envelope[s] of $150,000 per community," with an initial application in five areas of the Mibalè district (UN MPTFO 2018). The UN employed a process of community-based consultation with local authorities and representatives of cholera victims to select feasible projects for implementation. With feasibility contingent on "sustainability of the action," "alignment with local development plans," and "cost-benefit analysis," among other considerations (UN MPTFO 2019), "the dearth in funding—rather than victims' rights or the UN's duties—[…] determined the content and scope of the New Approach" (IHRC–HLS and BAI–IJDH 2020, 3). The actions selected for Mibalè included the rehabilitation of water systems, the installation of drinking-water supply systems, and the construction of a market (UN MPTFO 2018).

During my fieldwork, I traveled by motorcycle to visit the site of the future market being built outside of town. Locals in hardhats shoveled earth, carried stones, and poured concrete to build the foundation, Edmond chatted with a Haitian journalist eager to interview him about the project.

> We're using the $150,000 to improve our market. You can see that it's bordered by a stream. During market days, people use the stream to get water, rinse their hands, and wash their dishes. Meanwhile, others are going to the bathroom nearby, so the water gets contaminated. When it rained, the market would get flooded. Many people got sick with cholera here. It's not a lot of money, but we are making sure to use some of it to build a sanitary toilet. We don't want all of this to go to waste. People also need a safe place to wash their hands and get water, yet we don't have enough to drill a well for a pump. We always get lectured about hygiene, but we lack the materials to follow these practices.

Edmond's reflections capture many Haitians' similar frustrations with the system of top-down humanitarian aid in their country (c.f. Schuller 2016). Attempts to "socially engineer" improved hygiene practices always already fell short in the face of deteriorating access to improved water sources, especially in rural areas (WHO and UNICEF 2021). The UN doubly-failed cholera victims by not holding itself to the same standards of human rights and rule of law it was simultaneously promoting in Haiti, and by perpetuating a racialized system of victim-blaming.

While the perspectives of elected officials like Edmond were to some extent taken into consideration, many community members and especially victims of cholera remained marginalized. In one 2017 project report, UN administrators relate how "expectations of the population are high and given the limited funds available . . . they are unlikely to be met" (UN MPTFO 2017, 6). Blaming the Haitian legal advocacy organization BAI for creating "unrealistic expectations from communities, local authorities, and media," the UN felt compelled to institute "mitigation measures to counter [BAI's] interventions" (ibid., 6). The UN interpreted Haitians' calls for justice as a threat, and their commemorative activities in Mibalè as a risk. The entanglement between the UN and toxigenic V. *cholerae* is situated in a colonial matrix of power. The introduction of toxigenic *V. cholerae* into Haiti through improperly disposed contaminated waste at a MINUSTAH camp offered what seemed to be irrefutable evidence that the UN breached its obligations to environmental safety, resulting in violations of the rights to life, health, water and sanitation, and an adequate standard of living. When faced with these claims, however, the UN not only asserted its immunity but reneged on its responsibility to establish an independent standing claims commission for Haitian victims. The disavowal became a means to preserve the status quo of its authority, knowledge production, control over social reproduction, and advancement of the European-modeled nation-state and racial hierarchy—at human cost (IHRC–HLS and BAI–IJDH 2020, 18). By excluding as irrelevant voices attempting to hold it accountable while engaging those agreeing to work within its structure of power, the UN perpetuated the modern colonial system.

In an analogous case of claims for compensation where "the victim was white," one former UN official who worked in the Office of Legal Affairs noted, the UN was quick to compensate (ibid., 14). Reflecting on the implications of the UN's role in the Haiti cholera epidemic during a May 2020 interview, Philip Alston, the UN Monitor on Extreme Poverty and Human Rights, claimed that the UN's failure to mobilize a substantive response is only understandable by accepting that "an element of racism is involved here" (Pilkington 2020). "If this happened to a white community in a country with any standing globally," he went on to say, "the UN wouldn't have done—and wouldn't have been able to do—nothing." Instead, the UN and other powerful stakeholders upheld explanations for the presence and spread of *V. cholerae* in Haiti that echoed those of imperial Britain on the first outbreaks of pandemic cholera in nineteenth-century colonial

India: "somehow or other, the climate, the people, the land . . . were to blame" (Arnold 1986). From this perspective, the particularities of Haiti's environment, including a preceding earthquake and hurricane (Hasan et al. 2012), the density, hygiene practices, and "naïve" immunity of its population (Chase 2010; Cravioto et al. 2011), and its seemingly intractable poverty and weak infrastructure (MPHP NDWSS 2013; UN 2016), rendered the country naturally susceptible to an outbreak of toxigenic vibrios. A sociogenic approach reveals how racism suffuses the structural, systemic, and biosocial entanglements that actually generate susceptibility. When such claims are divorced from historical context or deployed for institutional protection at the expense of cholera victims, they contribute to a racism which is not just elemental to coloniality, but pathogenic.

Haiti's first cholera epidemic was declared "over" in early 2019. By February 2022, no laboratory-confirmed cases of cholera had been recorded in Haiti for three consecutive years (*iciHaiti* 2022), meeting the Global Task Force on Cholera Control's criteria for elimination of disease transmission (2017). Despite funding limitations, piecemeal projects, unmet goals, and weaker water and sanitation infrastructure than when the epidemic was first announced, Haiti and its international partners ended up achieving the objective of their 10-year national plan to end cholera transmission. While the implementation of this strategy contributed to bringing the 2010 epidemic to a close, so too did such factors as Haitians' own daily enactments of disease prevention, protective immunity among survivors, and access to an expanding market of purified reverse osmosis drinking-water. After 100 months of transmission, experts concurred that toxigenic *V. cholerae* had effectively disappeared from aquatic environments and host gastrointestinal systems—at least by official report (Rebaudet et al. 2021).

Although the microbe no longer circulated as it once had, an enduring colonial matrix of power kept Haiti susceptible to the reactivation of *V. cholerae's* pathogenicities. Amid waning population immunity, a number of destabilizing events—including the Covid-19 pandemic, significant changes in the country's fuel supply (Esposito 2019), accelerated expulsions of Haitian migrants from the United States, an influx of arms trafficking, and the shocking 2021 assassination of President Jovenel Moise and subsequent installation of US-backed leadership—contributed to a state of intense insecurity which continues to grip Haiti and exacerbate structural vulnerabilities. By the end of September 2022, new cases of cholera emerged in the capital, heralding the beginning of Haiti's second major epidemic.[4] Phylogenetic analyses of the 2022 toxigenic strain suggest that the outbreak "was caused, at least in part, by a descendant of the *V. cholerae* strain that caused the 2010 epidemic" (Rubin et al. 2022, 2388). In other words, epidemiologically significant cholera transmission reemerged when enough hosts lost access to safe drinking-water and ingested virulent

[4] Around the same time, Culligan's Port-au-Prince-based Caribbean Bottling Company—the first and largest distributer of purified drinking water in Haiti—announced a standstill in operations on October 2 having completely exhausted its fuel supply (Culligan_cbc 2022). Smaller scale water businesses undoubtedly faced similar limitations earlier on, and even the national water utility lacked fuel to pump potable water from its reservoirs (Severe et al. 2022).

vibrios still circulating in the environment and population. Yet again, it wasn't the water source that made people sick, but the persistence of coloniality that allowed cholera to become pathogenic.

Conclusion

Rather than take cholera as simply a reflection of upstream forces structuring its spread, this article considers how the microbe does not simply inhabit the social world but participates actively in it. With the nineteenth-century expansion of pandemic cholera, a confluence of emerging germ theory, epidemiological science, and Euro-American racial hierarchies located vibrios in contaminated water and communities contaminated by immigration, destitution, and moral depravity. Identifying the environmental factors promoting *V. cholerae's* transmission spurred many early public health efforts aimed at surveillance, sanitation, and drinking-water infrastructure. As transmission plummeted in wealthier nations, the racially coded presumptions about cholera persisted, becoming a disease of poverty, conflict, and post-disaster—but only in predominantly non-white countries. A sociogenic analysis of the novel 2010 Haiti cholera epidemic demonstrates how the embodied relationship between vibrios and their hosts shapes the link between coloniality and racism. *V. cholerae* is itself generative—not just of symptoms, but of a particular kind of physical and imagined potential made racialized.

Biology cannot be separated from its larger societal context, and understanding these interactions is crucial for addressing environmental and health challenges. Sociogeny intentionally works to recognize the role of racism in the social production of biology, contributing a critical theorization often omitted from STS scholarship. Rather than the often-applied universalizing notion of social constructivism, race is better understood as a technology of coloniality that in various key instances emerges from and is enacted in relation to pathogens. In this article, I found that what is socially constructed about race is host susceptibility, just as what is socially constructed about *V. cholerae* is its virulence. As a sociogenic phenomenon, as opposed to one fixed in nature or ontologically given, pathogenicity is situated in racialized structures, ideas, and practices that give rise to physiological harm. This approach to *V. cholerae* pathogenicity highlights the ways the social production of racial-colonial harm operates at multiple scales: at the body (disease), race is used as a tool for managing human difference and maintaining white supremacy; at the population (epidemic), racism is evident in differential exposure to harm and structural vulnerability; and at the international (geopolitical scandal), the sanctioning of Euro-American institutional impunity and protection of absolute immunity exposes systemic and personally mediated racism that also galvanizes claims for justice and equity. The microbe participates in the means by which humans negotiate power amid persistent coloniality. Sociogeny brings awareness to how the relationship between racism and cholera is rooted in the ways humans and vibrios mutually arise.

Acknowledgements

I would like to thank, first and foremost, friends, colleagues, and research participants across Haiti without whom this work would have not been possible. My special acknowledgements to Dr. Paul Farmer, Mario Joseph, Elio Dortilus, and Sonson. I am grateful to Drs. Liz Roberts, Erica Caple-James, Scott Stonington, Ruth Behar, Paul Johnson, Silvia Lindtner, Gabrielle Hecht, and members of the University of Helsinki's Centre for the Social Science of Microbes, who were all instrumental in shaping this article. Several sources of funding supported this publication, including the National Science Foundation and the University of Michigan Medical Scientist Training Program, Institute for the Humanities, and Department of Anthropology.

Author Biography

Victoria Koski-Karell, MD, PhD, received their doctoral degrees in medicine and sociocultural anthropology at the University of Michigan and is currently an emergency medicine resident at the University of Washington.

References

Al Jazeera. 2010. "UN Investigates Haiti Outbreak," *Al Jazeera*, English Edition, October 28, 2010. Accessed March 1, 2022. https://www.aljazeera.com/news/africa/2010/10/201010284141214196 7.html.

Alston, Philip, Ahmed Reid, Baskut Tuncak, Dainius Pura, et al. 2020. "Special Rapporteur on the human rights to safe drinking water and sanitation." Joint Letter to Mr. Antonio Guterres, United Nations Secretary General, April 28, 2020, AL OTH 35/2020, Geneva, Switzerland. Accessed March 1, 2022. https://spcommreports.ohchr.org/TMResultsBase/DownLoadPublicCommunicationFile?gId=25228.

Anderson, Warwick. 2006. *Colonial Pathologies: American Tropical Medicine, Race, and Hygiene in the Philippines*. Durham: Duke University Press.

Arnold, David. 1986. "Cholera and Colonialism in British India." *Past & Present* 113: 118–151. http://www.jstor.org/stable/650982.

Barua, Dhiman. 1992. "History of Cholera." In *Cholera: Current Topics in Infectious Disease*, edited by Dhiman Barua and William B. Greenough III, 1–36. Current Topics in Infectious Disease Book Series. New York: Springer.

Bellamy, Alex J., and Paul D. Williams, eds. 2013. *Providing Peacekeepers: The Politics, Challenges, and Future of United Nations Peacekeeping Contributions*. Oxford: Oxford University Press.

Briggs, Charles L., and Clara Mantini-Briggs. 2003. *Stories in the Time of Cholera: Racial Profiling during a Medical Nightmare*. Berkeley: University of California Press.

Bureau des Avocats Internationaux [Office of International Lawyers]–Institute for Justice and Democracy in Haiti (BAI–IJDH). 2018. *Cholera Accountability*. Website. Accessed July 3, 2025. https://www.ijdh.org/our-work/accountability/cholera-accountability/frequently-asked-questions/.

Caruthers, William A. 1834. *The Kentuckian in New York: Or, The Adventures of Three Southerns. By a Virginian*. Volume 2. New York: Harper Brothers.

CDC Archive. 2010. *Acute Watery Diarrhea and Cholera: Haiti Pre-Decision Brief for Public Health Action*. U.S. Centers for Disease Control and Prevention, National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), Division of Foodborne, Waterborne, and Environmental Diseases (DFWED). Last reviewed October 29, 2014. Accessed June 26, 2025. https://archive.cdc.gov/www_cdc_gov/cholera/haiti/pre-decision-brief.html.

Chase, Jefferson. 2010. "Cholera in Haiti," *Deutsche Welle*, October 27, 2010. Accessed March 1, 2022. https://www.dw.com/en/causes-and-blame-for-haitian-cholera-outbreak-are-difficult-to-pinpoint/a-6152444.

Chigudu, Simukai. 2020. *The Political Life of an Epidemic: Cholera, Crisis and Citizenship in Zimbabwe*. Cambridge, UK: Cambridge University Press. https://doi.org/10.1017/9781108773928.

Cho, Jennifer Y., Rui Liu, John C. Macbeth, and Ansel Hsiao. 2021. "The Interface of *Vibrio cholerae* and the Gut Microbiome." *Gut Microbes* 13(1): 1–31. https://doi.org/10.1080/19490976.2021.1937015.

Clarke, Joe S., and Ed Pilkington. 2016. "Leaked UN Report Faults Sanitation at Haiti Bases at Time of Cholera Outbreak," *The Guardian*, April 5, 2016. Accessed February 20, 2022. https://www.theguardian.com/world/2016/apr/05/leaked-un-report-sanitation-haiti-bases-cholera-outbreak.

Cravioto, Alejandro, Claudio F. Lanata, Daniele S. Lantagne, and G. Balakrish Nair. 2011. "Final Report of the Independent Panel of Experts on the Cholera Outbreak in Haiti." Report to the United Nations, May 4, 2011. Accessed June 26, 2025. https://reliefweb.int/report/haiti/final-report-independent-panel-experts-cholera-outbreak-haiti.

Culligan_cbc. 2022. Instagram, October 2, 2022. Accessed December 20, 2022. https://www.instagram.com/p/CjOHwsFLJ1Z/?hl=en.

Danticat, Edwidge. 2015. "The Long Legacy of Occupation in Haiti," *The New Yorker*, July 28, 2015. Accessed May 5, 2021. https://www.newyorker.com/news/news-desk/haiti-us-occupation-hundred-year-anniversary.

Dessalines, Jean-Jacques. 1805. "Constitution d'Haïti" [*Constitution of Haiti*]. BNF: Gallica, archive. May 20, 1805. Accessed March 1, 2022. https://gallica.bnf.fr/ark:/12148/bpt6k316887c/f5.image.

Domman, Daryl, Marie-Laure Quilici, Matthew J. Dorman, Elisabeth Njamkepo, et al. 2017. "Integrated View of *Vibrio cholerae* in the Americas." *Science* 358(6364): 789–793. https://doi.org/10.1126/science.aao2136.

Dowell, Scott F., and Christopher R. Braden. 2011. "Implications of the Introduction of Cholera to Haiti." *Emerging Infectious Diseases* 17(7): 1299–1300. https://doi.org/10.3201/eid1707.110625.

Dubois, Laurent. 2012. *Haiti: The Aftershocks of History*. New York: Metropolitan Books.

Dupuy, Alex. 2007. *The Prophet and Power: Jean-Bertrand Aristide, the International Community, and Haiti*. Lanham, MD: Rowman and Littlefield Publishers, Inc.

Echenberg, Myron J. 2011. *Africa in the Time of Cholera: A History of Pandemics from 1817 to the Present*. New York: Cambridge University Press. https://doi.org/10.1017/CBO9780511976599.

Esposito, Anthony. 2019. "Row with U.S. Energy Trader Worsens Haiti's Fuel Crisis." *Reuters*, April 14, 2019. Accessed December 20, 2022. https://www.reuters.com/article/us-haiti-fuel/dispute-with-u-s-energy-trader-worsens-haitis-fuel-crisis-idUSKCN1RQ0MD.

Esquivel, Adolfo Pérez, Jody Williams, Shirin Ebadi, Rigoberta Menchú Tum, et al. 2017. "The U.N. Owes Haiti Relief From Cholera Epidemic It Introduced," *Miami Herald*, June 21, 2017. Accessed March 1, 2022. https://www.miamiherald.com/opinion/op-ed/article157499959.html.

Fanon, Frantz. [1952] 2008. *Black Skin, White Masks*. Translated by Richard Philcox. New York: Grove Press.

———. [1961] 2004. *The Wretched of the Earth*. Translated by Richard Philcox. New York: Grove Press.

Farmer, Paul. 1992. *AIDS and Accusation: Haiti and the Geography of Blame*. Berkeley: University of California, Press.

———. 2001. *Infections and Inequalities: The Modern Plagues*. Berkeley: University of California Press.

———. 2011. *Haiti After the Earthquake*. New York: PublicAffairs.

Faruque, Shah M., Nityananda Chowdhury, M. Kamruzzaman, Michelle Dziejman, et al. 2004. "Genetic Diversity and Virulence Potential of Environmental *Vibrio cholerae* Population in a Cholera-Endemic Area." *Proceedings of the National Academy of Sciences* 101(7): 2123–2128. https://doi.org/10.1073/pnas.0308485100.

Fick, Carolyn E. 2009. "The Saint-Domingue Slave Revolution and the Unfolding of Independence, 1791–1804." In *The World of the Haitian Revolution*, edited by David Patrick Geggus and Norman Fiering. Bloomington: Indiana University Press.

Frerichs, Ralph R. 2016. *Deadly River: Cholera and Cover-Up in Post-Earthquake Haiti*. Ithaca: Cornell University Press.

Galeano, Eduardo. 1973. *Open Veins of Latin America: Five Centuries of the Pillage of a Continent*. New York: Monthly Review Press.

Gamio, Lazaro, Constant Méheut, Catherine Porter, Selam Gebrekidan, et al. 2022. "The Ransom: Haiti's Lost Billions," *The New York Times*, May 20, 2022. Accessed December 20, 2022. https://www.nytimes.com/interactive/2022/05/20/world/americas/enslaved-haiti-debt-timeline.html.

Gilmore, Ruth Wilson. 2002. "Race and Globalization." In *Geographies of Global Change: Remapping the World*, edited by R. J. Johnston, Peter J. Taylor, and Michael J. Watts. Second Edition. Malden: Blackwell.

Gladstone, Rick. 2016. "Cholera Deaths in Haiti Could Far Exceed Official Count," *The New York Times*, March 18, 2016. Accessed May 1, 2021. https://www.nytimes.com/2016/03/19/world/americas/cholera-deaths-in-haiti-could-far-exceed-official-count.html.

Global Task Force on Cholera Control (GTFCC). 2017. "Ending Cholera: A Global Roadmap to 2030." Report of the GTFCC meeting, October 4, 2017. Accessed February 20, 2022. https://www.gtfcc.org/wp-content/uploads/2020/09/ending-cholera-a-global-roadmap-to-2030.pdf.

Guillaume, Yodeline, Max Raymond, Gregory J. Jerome, Ralph Ternier, et al. 2019. "'It was a Ravage!': Lived Experiences of Epidemic Cholera in Rural Haiti." *BMJ Global Health* 4(6): 1–9. https://doi.org/10.1136/bmjgh-2019-001834.

Harris, Jason B., Regina C. LaRocque, Firdausi Qadri, Edward T. Ryan, et al. 2012. "Cholera." *Lancet* 379(9835): 2466–2476. https://doi.org/10.1016/S0140-6736(12)60436-X.

Harrison, Mark. 2020. "A Dreadful Scourge: Cholera in Early Nineteenth-Century India." *Modern Asian Studies* 54(2): 502–53. https://doi.org/10.1017/S0026749X17001032.

Hasan, Nur A., Seon Young Choi, Mark Eppinger, Philip W. Clark, et al. 2012. "Genomic Diversity of 2010 Haitian Cholera Outbreak Strains." *Proceedings of the National Academy of Sciences* 109(29): 1–7. https://doi.org/10.1073/pnas.1207359109.

Hendriksen, Rene S., Lance B. Price, James M. Schupp, John D. Gillece, et al. 2011. "Population Genetics of *Vibrio cholerae* from Nepal in 2010: Evidence on the Origin of the Haitian Outbreak." *mBio* 2(4): 1–6. https://doi.org/10.1128/mBio.00157-11.

Houston, Adam. 2017. "UNstoppable: How Advocates Persevered in the Fight for Justice for Haitian Cholera Victims." *Health and Human Rights Journal* 19(1): 299–304. https://pmc.ncbi.nlm.nih.gov/articles/PMC5473059/.

iciHaiti. 2022. "iciHaiti – Health: 3 Years Without Cholera, Haiti Awaits its WHO Elimination Certificate," *iciHaiti*, February 5, 2022. Accessed March 1, 2022. https://www.icihaiti.com/en/news-35889-icihaiti-health-3-years-without-cholera-haiti-awaits-its-who-elimination-certificate.html.

International Human Rights Clinic–Harvard Law School (IHRC–HLS), and Bureau des Avocats Internationaux [Office of International Lawyers]–Institute for Justice and Democracy in Haiti (BAI–IJDH). 2020. "Violations of the Right to Effective Remedy: The UN's Responsibility for Cholera in Haiti." Joint submission to the UN special rapporteur on the promotion of truth, justice, reparation and guarantees of non-recurrence, February 6, 2020. Accessed January 20, 2022. http://hrp.law.harvard.edu/wp-content/uploads/2020/02/HLS-IHRC-IJDH-BAI-Submission-to-Special-Procedures_Cholera.pdf.

Jackson, Brendan R., Deborah F. Talkington, James M. Pruckler, M. D. Bernadette Fouché, et al. 2013. "Seroepidemiologic Survey of Epidemic Cholera in Haiti to Assess Spectrum of Illness and Risk Factors for Severe Disease." *The American Journal of Tropical Medicine and Hygiene* 89(4): 654–664. https://doi.org/10.4269/ajtmh.13-0208.

Jenson, Deborah, Victoria Szabo, and the Duke Franklin Humanities Institute (FHI) Haiti Humanities Laboratory Student Research Team. 2011. "Cholera in Haiti and Other Caribbean Regions, 19th Century." *Emerging Infectious Diseases* 17(11): 2130–2135. https://doi.org/10.3201/eid1711.110958.

Jones, Camara P. 1994. "Methods for Comparing Distributions: Development and Application Exploring 'Race'-Associated Differences in Systolic Blood Pressure." PhD Dissertation. Baltimore: Johns Hopkins School of Hygiene and Public Health.

———. 2000. "Levels of Racism: A Theoretic Framework and a Gardener's Tale." *American Journal of Public Health* 90(8): 1212–1215. https://doi.org/10.2105/ajph.90.8.1212.

Katz, Jonathan M. 2013. "Do Natural Disasters Breed Health Epidemics?" *Popular Science*, January 7, 2013. Accessed May 15, 2021. https://www.popsci.com/science/article/2012-12/do-natural-disasters-really-make-epidemics-spread/.

Ki-moon, Ban. 2016. "Remarks to the General Assembly on a New Approach to Address Cholera in Haiti," UN Headquarters, New York, December 1, 2016. Accessed March 1, 2022. https://www.un.org/sg/en/content/sg/speeches/2016-12-01.

Kolbe, Athena R., and Royce A. Hutson. 2006. "Human Rights Abuse and Other Criminal Violations in Port-au-Prince, Haiti: A Random Survey of Households." *Lancet* 368(9538): 864–73. https://doi.org/10.1016/S0140-6736(06)69211-8.

Krieger, Nancy. 2020. "Measures of Racism, Sexism, Heterosexism, and Gender Binarism for Health Equity Research: From Structural Injustice to Embodied Harm—An Ecosocial Analysis." *Annual Review of Public Health* 41: 37–62. https://doi.org/10.1146/annurev-publhealth-040119-094017.

Latour, Bruno. 1988. *The Pasteurization of France*. Translated by Alan Sheridan and John Law. Cambridge, MA: Harvard University Press.

Lee, Elizabeth C., Dennis L. Chao, Joseph C. Lemaitre, Laura Matrajt, et al. 2020. "Achieving Coordinated National Immunity and Cholera Elimination in Haiti through Vaccination: A Modelling Study." *Lancet Global Health* 8(8): 1–9. https://doi.org/10.1016/S2214-109X(20)30310-7.

Lentin, Alana. 2020. *Why Race Still Matters*. Cambridge, UK: Polity Press.

———. 2022. "Race as Technology." *Alanalentin.* Blog, May 2, 2022. Accessed Nov 30, 2022. https://www.alanalentin.net/2022/05/02/race-as-a-technology/.

Lewontin, Richard C., and Richard Levins. 2007. *Biology Under the Influence: Dialectical Essays on Ecology, Agriculture, and Health*. New York: Monthly Review Press.

Luquero, Francisco J., Marc Rondy, Jacques Boncy, André Munger, et al. 2016. "Mortality Rates During Cholera Epidemic, Haiti, 2010–2011." *Emerging Infectious Diseases* 22(3): 410–6. https://doi.org/10.3201/eid2203.141970.

Mignolo, Walter D. 2007. "Introduction: Coloniality of Power and De-Colonial Thinking." *Cultural Studies* 21(2–3): 155–167. https://doi.org/10.1080/09502380601162498.

Minn, Pierre H. 2011. "'Where They Need Me': The Moral Economy of International Medical Aid in Haiti." PhD Dissertation. Montreal, McGill University.

Mintz, Sidney W. 1989. *Caribbean Transformations*. New York: Columbia University Press.

Mol, Annemarie. 2002. *The Body Multiple: Ontology in Medical Practice*. Durham: Duke University Press.

MPHP and NDWSS. 2013. "National Plan for the Elimination of Cholera in Haiti, 2013–2022." Ministry of Public Health and Population, and National Directorate for Water Supply and Sanitation, February 2013, Republic of Haiti. Accessed February 20, 2022. https://www.paho.org/en/documents/national-plan-elimination-cholera-haiti-2013-2022.

Mutreja, Ankur, Dong Wook Kim, Nicholas R. Thomson, Thomas R. Connor, et al. 2011. "Evidence for Several Waves of Global Transmission in the Seventh Cholera Pandemic." *Nature* 477(7365): 462–465. https://doi.org/10.1038/nature10392.

Nair, G. Balakrish, and Yoshifumi Takeda, eds. 2014. *Cholera Outbreaks*. Berlin: Springer. https://doi.org/10.1007/978-3-642-55404-9.

Nichols, Michelle. 2016. "U.N. Wants $200 Million to Pay Haiti's Cholera Victims, Communities," *Reuters*, October 25, 2016. https://www.reuters.com/article/us-haiti-cholera-un/u-n-wants-200-million-to-pay-haitis-cholera-victims-communities-idUSKCN12O2OB.

O'Connor, Erin. 2000. *Raw Material: Producing Pathology in Victorian Culture*. Durham: Duke University Press.

Oprea, Mihaela, Elisabeth Njamkepo, Daniela Cristea, Anna Zhukova, et al. 2020. "The Seventh Pandemic of Cholera in Europe Revisited by Microbial Genomics." *Nature Communications* 11(1): 1–10. https://doi.org/10.1038/s41467-020-19185-y.

Pan American Health Organization (PAHO), and World Health Organization (WHO). 2013. *Epidemiological Update, Cholera: 21 November 2013*. Report on the status of cholera in Cuba, Dominican Republic, Haiti, and Mexico. Accessed May 9, 2021. https://www.paho.org/en/documents/21-november-2013-cholera-situation-americas-update-0.

Piarroux, Renaud, Robert Barrais, Benoît Faucher, Rachel Haus, et al. 2011. "Understanding the Cholera Epidemic, Haiti." *Emerging Infectious Diseases* 17(7): 1161–8. https://doi.org/10.3201/eid1707.110059.

Pilkington, Ed. 2020. "UN Response to Haiti Cholera Epidemic Lambasted by Its Own Rights Monitors," *The Guardian*, May 4, 2020. Accessed January 15, 2021. https://amp.theguardian.com/world/2020/may/04/united-nations-un-haiti-cholera-letter-rights-monitors.

Quijano, Aníbal, and Michael Ennis. 2000. "Coloniality of Power, Eurocentrism, and Latin America." *Nepantla: Views from South* 1(3): 533–580.

Rebaudet, Stanislas, Patrick Dély, Jacques Boncy, Jean Hugues Henrys, et al. 2021. "Toward Cholera Elimination, Haiti." *Emerging Infectious Diseases* 27(11): 2932–6. https://doi.org/10.3201/eid2711.203372.

Renda, Mary A. 2001. *Taking Haiti: Military Occupation and the Culture of U.S. Imperialism, 1915–1940*. Chapel Hill: University of North Carolina Press.

Robinson, Cedric J. 1983. *Black Marxism: The Making of the Black Radical Tradition*. London: Zed.

Rogers, L. 1928. *The Incidence and Spread of Cholera in India; Forecasting and Control of Epidemics*. Calcutta.

Rosenberg, Charles E. [1962] 1987. *The Cholera Years: The United States in 1832, 1849, and 1866*. Chicago: University of Chicago Press.

Rubin, Daniel H. F., Franz G. Zingl, Deborah R. Leitner, Ralph Ternier, et al. 2022. "Reemergence of Cholera in Haiti." *New England Journal of Medicine* 387(25): 2387–9. https://doi.org/10.1056/NEJMc2213908.

Schuller, Mark. 2016. *Humanitarian Aftershocks in Haiti*. New Brunswick: Rutgers University Press.

Sciampacone, Amanda. 2022. "The 'Scourge of Modern Times': Cholera, Race, and Empire in Early Nineteenth-Century British Illustrated Print Culture." *Journal of Victorian Culture* 27(2): 356–69. https://doi.org/10.1093/jvcult/vcac020.

Scott, David. 2000. "The Re-Enchantment of Humanism: An Interview With Sylvia Wynter." *Small Axe* 8: 119–207. https://files.libcom.org/files/Wynter_1_1.pdf.

Sérant, Claude Bernard. 2010. "Pas de Porte de Sortie Pour le Choléra" [No Way Out for Cholera]. *Le Nouvelliste*, October 27, 2010. Accessed May 1, 2021. https://lenouvelliste.com/article/85112/pas-de-porte-de-sortie-pour-le-cholera.

Severe, Karine, Nadalette Alcenat, and Vanessa Rouzier. 2022. "Resurgence of Cholera in Haiti amidst Humanitarian Crises." *New England Journal of Medicine* 387(25): 2389–2391. https://doi.org/10.1056/NEJMc2213782.

Shah, Kamil. 2009. "The Failure of State Building and the Promise of State Failure: Reinterpreting the Security-Development Nexus in Haiti." *Third World Quarterly* 30(1): 17–34. https://doi.org/10.1080/01436590802622243.

Sontag, Deborah. 2012. "In Haiti, Global Failures on a Cholera Epidemic," *The New York Times*, March 31, 2012. Accessed June 20, 2024. https://www.nytimes.com/2012/04/01/world/americas/haitis-cholera-outraced-the-experts-and-tainted-the-un.html.

Subramanya, Sandeep B., Vazhaikkurichi M. Rajendran, Pugazhendhi Srinivasan, Navalpur S. Nanda Kumar, et al. 2007. "Differential Regulation of Cholera Toxin-Inhibited Na-H Exchange Isoforms by Butyrate in Rat Ileum." *American Journal of Physiology: Gastrointestinal and Liver Physiology* 293(4): 1–7. https://doi.org/10.1152/ajpgi.00462.2006.

United Nations. 2009. On the Line (MINUSTAH). Accessed July 3, 2025. https://www.youtube.com/watch?v=yweLsMH6VGU.

United Nations Digital Library. 2010. UNSC Resolution 1908. Accessed July 3, 2025. https://digitallibrary.un.org/record/675259?ln=en&v=pdf#files.

———. 2014. "Promotion of truth, justice, reparation and guarantees of non-recurrence: note by the Secretary-General." Transmits report of the Special Rapporteur, Pablo de Greiff, pursuant to Human Rights Council resolution 18/7, 69th Session of the General Assembly of the United Nations, October 14, 2014, A/69/5180. Accessed June 26, 2025. https://digitallibrary.un.org/record/782020?ln=en.

———. 2016. "A New Approach to Cholera in Haiti." Report by the Secretary-General Ban Ki-moon, 71st Session of the General Assembly of the United Nations, November 25, 2016, A/71/620. Accessed June 26, 2025. https://digitallibrary.un.org/record/849994?v=pdf.

UN Multi-Partner Trust Fund Office (UN MPTFO). 2016. "Haiti Cholera Response Multi-Partner Trust Fund: Resourcing Collaborative and Comprehensive Responses to Cholera Outbreaks in Haiti,"

fund created October 14, 2016. Accessed June 20, 2023. https://mptf.undp.org/fund/clh00.

———. 2017. "Project Narrative Report." Accessed July 2, 2025. https://mptf.undp.org/sites/default/files/documents/30000/clh01_annual_progress_report_paho_2017.pdf.

———. 2018. "Annual Report: UN Haiti Cholera Response Multi-Partner Trust Fund." Office of the UN Secretary-General's special envoy for Haiti and UN Multi-Partner Trust Fund Office, December 31, 2018. Accessed June 26, 2025. https://mptf.undp.org/sites/default/files/documents/30000/2018_annual_report_un_haiti_cholera_response-mptf.pdf.

———. 2019. "UN Haiti Cholera Response Multi-Partner Trust Fund." Annual Report. Office of the UN Secretary-General's special envoy for Haiti and UN Multi-Partner Trust Fund Office, December 31, 2019. Accessed June 26, 2026. https://mptf.undp.org/sites/default/files/documents/35000/annual_report_2019_un_haiti_cholera_response_mptf.pdf.

UN Office of Internal Oversight Services (UN OIOS). 2015. "Audit of Waste Management in the United Nations Stabilization Mission in Haiti," June 30, 2015, Report 2015/068, Assignment No. AP2014/683/07. Accessed March 1, 2022. https://oios.un.org/file/5633/download?token=FBWLeHQb.

UN Peacekeeping. 2021. "MINUSTAH Fact Sheet: United Nations Stabilization Mission in Haiti," Current Operations. Accessed May 1, 2021. https://peacekeeping.un.org/en/mission/minustah.

United Nations Security Council (UNSC). 2022. "Peacekeeping Operations." Field Missions Dashboard. Accessed February 20, 2022. https://www.un.org/securitycouncil/content/repertoire/peacekeeping-missions.

United States Congress. 1922. "Inquiry into occupation and administration of Haiti and Santo Domingo: Hearings before a Select Committee on Haiti and Santo Domingo, United States Senate, Sixty-seventh Congress, first and second sessions, pursuant to S. Res. 112 authorizing a special committee to inquire into the occupation and administration of the territories of the Republic of Haiti and the Dominican Republic." Record of proceedings of a court of inquiry convened at the Navy Department, Washington, October 19, 1920, by order of the Secretary of the Navy, to inquire into the conduct of the personnel of the naval service that has served in Haiti since July 28, 1915, (2): 1585–1842. Washington, D.C: Government Printing Office. Accessed June 26, 2025. https://dp.la/item/2e95ab909e9fea48242d0d2167a1b7b3.

U.S. Library of Congress. 2024. *United Nations Issues: U.S. Funding of U.N. Peacekeeping*. Report 'In Focus' by Luisa Blanchfield, Congressional Research Service (CRS). Updated April 9, 2024, IF10597, version 23. Accessed June 26, 2025. https://www.congress.gov/crs-product/IF10597?q=%7B%22search%22%3A%22IF10597%22%7D&s=1&r=1.

U.S. Government Accountability Office (GAO). 2006. *PEACEKEEPING: Cost Comparison of Actual UN and Hypothetical U.S. Operations in Haiti*. Highlights report to the Subcommittee on Oversight and Investigations, Committee on International Relations, House of Representatives, February 2006, GAO-06-331. Accessed June 26, 2025. www.gao.gov/cgi-bin/getrpt?GAO-06-331.

Walker, Adrian. 2016. "Cholera Activists Force an Apology the UN Didn't Want to Issue," *The Boston Globe*, December 4, 2016. Accessed January 20, 2022. https://www.bostonglobe.com/metro/2016/12/04/cholera-activists-force-apology-united-nations-didn-want-issue/4qxVC6KSjob1fKQn5HQlSP/story.html.

Wang, Caroline, and Mary Ann Burris. 1997. "Photovoice: Concept, Methodology, and Use for Participatory Needs Assessment." *Health Education & Behavior* 24(3): 369–387. https://doi.org/10.1177/109019819702400309.

Weill, François-Xavier, Daryl Domman, Elisabeth Njamkepo, Cheryl Tarr, et al. 2017. "Genomic History of the Seventh Pandemic of Cholera in Africa." *Science* 358(6364): 785–789. https://doi.org/10.1126/science.aad5901.

World Health Organization (WHO). 2012. *Global Report for Research on Infectious Diseases of Poverty*. WHO on behalf of the Special Programme for Research and Training in Tropical Diseases (TDR). Geneva: World Health Organization. Accessed June 26, 2025. https://iris.who.int/bitstream/10665/44850/1/9789241564489_eng.pdf.

WHO, and UNICEF. 2021. "Progress on Household Drinking Water, Sanitation and Hygiene, 2000–2020. Five Years into the SDGs." Joint monitoring program for water supply, sanitation and hygiene. World Health Organization (WHO), and the United Nations Children's Fund (UNICEF). Accessed March 1, 2022. https://www.unwater.org/app/uploads/2021/07/jmp-2021-wash-households-LAUNCH-VERSION.pdf.

Williams, David R., Jourdyn A. Lawrence, and Brigette A. Davis. 2019. "Racism and Health: Evidence and Needed Research." *Annual Review of Public Health* 40(1): 105–125. https://doi.org/10.1146/annurev-publhealth-040218-043750.

Wynter, Sylvia. 2001. "Towards the Sociogenic Principle: Fanon, The Puzzle of Conscious Experience, of 'Identity' and What It's Like to Be 'Black.'" In *National Identity and Socio-Political Changes: Latin America between Marginalization and Integration*, edited by Mercedes Durán-Cogan and Antonio Gómez-Moriana. New York: Routledge.

———. 2003. "Unsettling the Coloniality of Being/Power/Truth/Freedom: Towards the Human, After Man, Its Overrepresentation—An Argument." *CR: The New Centennial Review* 3(3): 257–337. https://doi.org/10.1353/ncr.2004.0015.

Zhang, Ping, Fengjuan Li, Weili Liang, Jie Li, et al. 2014. "The Seventh Pandemic *Vibrio cholerae* O1 El Tor Isolate in China Has Undergone Genetic Shifts." *Journal of Clinical Microbiology* 52(3): 964–967. https://doi.org/10.1128/JCM.03121-13.