Editorial

Haiti's cholera epidemic: will it return in 2021?

Abstract

Cholera is a scourge that has plagued humanity from early times; no era was exempt at different times in history, and the mere mention of cholera in past generations often caused panic among susceptible populations. Now with the recent 7.2 magnitude in Haiti, the question re- emerges: can Haiti's cholera epidemic return considering the extensive earthquake damage that has recently occurred? Haiti is prone to earthquakes, due to its location along a fault line, and over the centuries has encountered numerous earthquakes, some including the 2010 and 2021 earthquakes of 7.0 or greater magnitude. Cholera has been around for centuries, and in the last century has caused at least 7 devastating global outbreaks each claiming thousands of innocent human lives. Cholera infects 1.3 to 4 million people around the world annually with over 20,000 deaths per year according to the World Health Organization (WHO) statistics. Cholera is a microbial disease of multicausal origin and fecal-oral transmission, where various biological, environmental, social, political and cultural factors often intervene, thereby presenting complex solutions for what often becomes a public health issue in the broader community. Over 819,000 Haitians became ill with cholera during the years following the 2010 earthquake, with nearly 10,000 deaths reported as a result of one of Haiti's main waterways accidently becoming contaminated with the highly infectious cholera organism. Considering the severe damages now being reported from the August – 2021 earthquake followed by a severe weather outlook, the potential for a re-emergence of the cholera epidemic may now become a serious public health threat to the island Nation, including the potential risks to other nearby Island nations in the Caribbean and beyond should infected carriers relocate to non-earthquake prone localities. Implementation of effective hygiene measures, including timely medical monitoring and strategic intervention where indicated will be essential to prevent a resurgence of cholera or other public health issues in the coming weeks and months aftermath of the destruction of the roads, structures and public health resources resulting from the recent earthquake in Haiti.

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Introduction

The Haiti earthquake of 2021. At 8:29:09 a.m. EDT on 14 August 2021, a magnitude 7.2 earthquake accompanied with tsunami warnings struck Haiti, the second serious earthquake in just over a decade.[1] The earthquake struck with a 10-km deep hypocenter in Petit-Trou-de-Nippes, near the coastal village of Les Cayes, approximately 150km West of the capital city of Port-au-Prince. The number of casualties is rapidly increasing, with the final numbers of deaths now exceeding 2200 at the time of this writing and likely to be in the thousands when all are counted, ranking it among the most devastating earthquakes of 2021. With a new tropical storm approaching only days after the earthquake, the seriousness of the disaster including the threats to human health becomes magnified to an even greater extent. The recent earthquake currently ranks among the deadliest such disasters worldwide since the 2018 Sulawesi earthquake occurred in a mountainous area of Indonesia.[2]

When cholera broke out in Haiti just months after the devastating January 12th, 2010, earthquake, resulting in over 220,000 immediate deaths, their already struggling healthcare system was literally pressed to the brink.[3] The extraordinary events and actions that followed that earthquake could offer an opportunity to develop strategies in dealing with a public health crisis and emphasizes the need for early interventional plans and measures to prevent or minimize the adversity that may occur in the absence of such early planning. In the years that followed the 2010 earthquake, Haiti encountered its first ever cholera epidemic in over 150 years of recorded history, during which entire prior time the small Caribbean nation was believed to be free of cholera, having never previously recorded a single case of the illness.[3,4] With serious disasters such as the Haiti earthquake and looming tropical storm forecasts, well-meaning foreign aid may often appear on site from afar, potentially carrying with it previously unencountered infectious germs from abroad, and unwittingly transported to the disaster area with the assistance teams and adding further insult to the magnitude of the disaster.[5,6] Such appears to have been the case for Haiti in 2010 and considering the extent of the devastation caused by the recent earthquake of August 14, 2021, the risks and benefits of well-intentioned foreign aid may soon re-emerge due to undetected carriers who may travel with the non-resident aid-workers. Haiti ranks among the poorest nations of the globe, and among the poorest Caribbean Island nations in the Caricom region.[3,7] Accordingly, Haiti likely has only a limited financial capacity and the needed and already strained public health and other governmental resources to accommodate or minimize the devastating fiscal and public health impact of a severe natural disaster as has now occurred, once again placing the health and well-being of the nation's population at risk.[3,7]

The disease Cholera has been around for centuries[8] and in our modern history there have been a resurgence of cholera epidemics seen to emerge, as when a devastating outbreak occurred in India.[9] There have been at least seven recent global pandemics of cholera worldwide claiming thousands of lives in past decades. Each year, cholera infects 1.3 to 4 million people around the world, causing between 21,000 to 143,000 deaths, according to the World Health Organization.[10–12] It is thus imperative to research this bacterial disease and determine ways of shedding light on better and more effective methods of

prevention and cure. Historically cholera epidemics have negatively impacted a number of nations and taken countless lives in poor and developing countries alike. Cholera is a well-known bacterial disease that is preventable and curable through adequate provision of public health and education measures, and which may become challenged following natural disasters.[8–12] Cholera is an acute intestinal infection caused by the ingestion of Vibrio cholerae, either type O1 or type O139, a bacterium that is often present in untreated or inadequately treated water and in food supplies inadvertently contaminated directly or indirectly by feces.[13] Cholera is usually transmitted through this water linked fecal-oral vectors, and it continues to constitute a permanent risk in many countries. Outbreaks may occur sporadically anywhere in the world where water supply, sanitation, food safety, or hygiene is inadequate.[6,8–13] The greatest risks occur in overcrowded communities, refugee settings, and following natural disasters where sanitation is poor, drinking water becomes unhealthy, and where increases in person-to-person transmission become prevalent. In 1817 the first documented pandemic occurred in Asia, which spread to Turkey and the Arab countries.[8,10] From that area, it has now spread to all the continents of the world as international travel has become possible and now more commonplace than in previous generations. The second recoded epidemic described between 1826 and 1851 affected the Americas for the first time.[13] It began in India and affected North, Central, and South America by 1832. Due to yearly death tolls of these epidemics, it is pertinent to carry out a review on the history, epidemiology, clinical picture, diagnosis, treatment, and prevention of this disease.[10]

The Haiti experience and how they resolved the 2010 cholera epidemic. Following the earthquake of January 2010, Haiti sought international assistance from numerous potential sources, including a call to the United Nations, where the needs for outside support and assistance could reach a worldwide appeal under the well-respected UN mantra.[9] In the weeks and months that followed, help arrived for public assistance and peacekeeping efforts from several counties, including a team from Nepal that established a working camp near the Artibonite river, a main river in Haiti that also served as a main agricultural and public water source for the surrounding farms and communities. Following the entrance of foreign support assistance teams from the WHO, they were observed to be dumping their waste into the Artibonite river that doubled as a water source for the residents of the local community.[3,5] By October 2010 the first cases of cholera were reported among residents who obtained their water for their rice farms and their personal consumption from the now contaminated Artibonite river.[3,15] Cholera would eventually sicken over 800,000 people, nearly 10% of Haiti's population, overwhelming the maximum capacity of their hospitals and healthcare resources, and result in the deaths of nearly 10,000 inhabitants in the months and years that followed.[3] It then became necessary for the government of Haiti to develop and implement a strong promotion of healthcare in their society in order to eradicate the disease, to guarantee quick attention to the sick and identify the contacts, and to impede the disorganization of the social and economic structure which had occurred following the earthquake in favor of improving the quality of the human life and their individual rights to healthcare. These goals were accomplished by establishing strong public health measures, including the establishment of effective community hygienic conditions and practices, water purification and testing measures, early medical intervention and supportive care for cholera patients, including greater access to antibiotics and therapeutic measures, and dissemination of individual protective measures to stem the spread of the disease.[3] By 2020, no new cases of cholera were reported in Haiti for the preceding 12months, and the epidemic was considered resolved.[3,15,16] Now 2021 poses a new challenge to Haiti, with the widespread structural and environmental destruction and damage to the area of Petit-Trou-de-Nippes and surrounding communities.[1,3,4]

Results and conclusion

Prior to 2010, Haiti had been cholera-free, having not recorded a single case of cholera over the past 150 years.[3] The first cases of cholera in Haiti were recorded in October 2010, just 10months after experiencing a major 7.0 magnitude earthquake which caused major structural and environmental damage to the Island Nation, including disruption and contamination of a primary domestic and industrial water supply that served much of their population.[15] The total numbers of cholera cases and deaths from 2010-2019 totaled 819,000 and 9,789 deaths respectively. By 2020 no additional cases or deaths from cholera were reported, thereby signaling the end of the epidemic. Cholera is presumed to have become prevalent in Haiti following the arrival of foreign workers who carried the disease and inadvertently directly transmitted the infectious bacterium to a major water supply via improper waste disposal. Haiti survived the cholera epidemic following the tragic earthquake of January 2010 over the course of the following decade, at the human cost of nearly 10,000 innocent lives out of some 850,000 ultimately infected by implementing improvements in public health education and preventive measures, by improving the safety and reliability of their water supply used for domestic and industrial uses and by making major strides in delivery of responsible and effective healthcare and therapeutic measures to their population.[3]

In August 2021, another earthquake of even greater magnitude struck Haiti without warning and now poses a new threat to their capacity to deliver humanitarian aid and effective public health measures and hopefully, to enable the country to prevent another catastrophe as occurred previously following the 2010 earthquake. The Republic of Haiti, with a population estimated at 11.4 million in a land area of 10,714 sq miles, is the third largest country in the Caribbean by land area, and its small relative size makes it the most populous Caribbean country. Located on the Island of Hispaniola in the Greater Antilles archipelago in the Caribbean, Haiti occupies only the Western three-eighths of the island which it shares with the Dominican Republic which occupies the other five-eighths of the island.. Because Haiti is located in close proximity to Hispaniola's other Dominican Republic and nearby Island nations including Turks and Caicos, Cuba, Jamaica, Puerto Rico and the Bahamas, transmission risks are not limited to local communities. Haiti's close proximity and interisland and international travel destinations also places the broader international community at risk should another cholera epidemic occur. Haiti is currently also experiencing the throes and community impact of the current Coronavirus pandemic, which has placed an additional strain on an already beleaguered healthcare system.[15] Only time will reveal the success of their public health measures to alleviate or prevent and/or control the next epidemic and preserve the health of the nation and its peoples.[16]

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Conflicts of interest

Author declare there are no conflicts of interest.

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