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The Cholera Epidemic in Haiti: A Geopolitical Approach to a Public Health Issue

Lucie Guimier[1]

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Abstract

Social and health indicators reflect the political instability and the economic deficiencies from which Haiti suffers. For example, infant mortality, an important development indicator, highlights the country's health deficiencies. Mortality has reached 86 per 1000 births. In other words, approximately one child in 12 dies before reaching the age of five. In such conditions, the outbreak of cholera in October 2010, in addition to the post-earthquake chaos, could only cause the country's health situation to deteriorate into complete disorder. The geopolitical approach aims to evaluate the impact of the disease in the region from several perspectives and to recognize the spatial discontinuities in terms of prevalence and incidence. The objective is then to understand the laws that govern observed differences in impact and evolution by identifying the territorialization of healthcare access in Haiti. The progressive seizure of power by international health assistance groups raises the problem of Haitian public-health services running out of steam compared to the private sector, a change aggravated by the current health crisis.

On January 12, 2010, an earthquake measuring 7.3 on the Richter scale hit the Port-au-Prince metropolitan area, Haiti's capital. To measure the risk presented by an earthquake, seismologists multiply seismic hazard by infrastructure vulnerability and population density. For the greater Port-au-Prince area, the risk was major. The intensity of aftershocks, building foundations that did not comply with anti-seismic standards, and the high population density of the affected area—15,106 inhabitants[2]

1. Second-year research master at the Institut français de géopolitique [French Institute of Geopolitics] (IFG)

2. *Institut haïtien de statistique et d'informatique*, "Total population, population over 19 years of age, estimated households and density in March 2009," (March 2009): 51. (2,296,386 inhabitants in a 152.02-km^2 area).

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per square kilometer—were key factors that combined to make this earthquake a humanitarian disaster. The number of human casualties testify to the extent of the damage: 316,000 dead, 350,000 wounded and 1.5 million left homeless, according to the report of Haiti's Prime Minister Jean-Marc Bellerive dated January 12, 2011 (Radio Canada 2011).

More than one year after the catastrophe, against a background of organizational difficulties between foreign partners, reconstruction of the damaged zones struggles for attention in a politically worrisome context, namely the accession of popular singer and apprentice politician, Michel Martelly, to the presidency. Following the earthquake catastrophe, another drama captured Haiti's national attention—a cholera epidemic. Nine months after the earthquake, in mid-October 2010, the first cases of cholera were diagnosed in the Haitian department of Centre. The infectious disease then quickly spread—900 people had died within one month (Baron 2010). On October 22, Minister of Health Dr. Alex Larsen declared a state of emergency and, in less than one month, the epidemic spread through all 10 departments of the country. To date, 439,604 people have been affected and 6,226 have died (Ministry of Health 2011).[3]

The term "epidemic" refers to the development and rapid spread of a contagious disease. Moreover, the idea of "epidemic" is accompanied by that of endemic disease: the epidemic may decrease but remain present in an endemic state. Its morbidity and mortality will remain low until a resurgence gives rise to a new epidemic outbreak. Finally, the term "pandemic" designates a form of epidemic that extends throughout a large number of countries. Humanity has known seven great cholera pandemics since 1817, all of which started in Asia. The seventh pandemic that is currently raging is responsible each year for three million to five million cases, resulting in 100,000 to 120,000 deaths, according to the World Health Organization (WHO) (Benkimoun 2010). Resulting from deficient hygiene and lack of access to clean water, cholera is a disease closely linked to the level of development in the countries where it spreads. The *Vibrio cholerae* pathogen is particularly mobile and, once in the intestine, it provokes significant dehydration characteristic of the infection. The subsequent loss of fluids can reach 15 liters per day. According to WHO, "cholera is an acute diarrheic disease that can cause death within several hours without treatment [. . .], 80 percent of cases can be successfully treated with oral rehydration salts." The infection results from ingesting water or food contaminated with the feces of infected humans. Thus, humans play both the role of growth medium and method of transmission for *V. cholerae*. The short incubation period—from two hours to five days—explains how numbers of cases can grow quite quickly.

3. Case report of the Haitian Ministry of Health and Population, August 29, 2011, www.mspp.gouv.ht.

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The current epidemic, due to a strain of *V. cholerae* baptized "El Tor 01," first appeared in 1961 in Indonesian territory. Strains of this pandemic at one time raged permanently in South and Central America but had not, until now, led to any cases on the island of Hispaniola, which Haiti shares with the Dominican Republic. Rapidly treated, cholera is a benign disease from which the patient recovers in a matter of days, but, with the sanitary situation in Haiti, the spread of the bacteria could not be rapidly controlled. Since the principal factors favoring disease transmission are the socioeconomic level and the living conditions of a population, the epidemic was able to propagate rapidly throughout Haitian territory, added to by the problems of waste water, excrement, household waste, and rain water. For all of these reasons, cholera became a plague in Haiti or, to repeat the comment of Dr. Rony Brauman,[4] "cholera is a disease that frightens" (France Info 2010). To analyze the cholera epidemic in Haiti as a geopolitical issue is not patently obvious, and this is why we need to recall the strong connections between studying the power relations in a given territory and analyzing the health of a population. Looking at the means deployed by different actors (the government, NGOs, the healthcare system) to battle cholera in Haiti's territory will help define what territorial disparities were at play within this humanitarian health response.

This analysis comes out of a one-month field research study in Port-au-Prince, from mid-February to mid-March 2011. We met with various actors including local doctors, NGO members, and universities in different disciplines—e.g., medicine, engineering. We also gathered observations from meetings at the Health Ministry of the West, bringing together a variety of humanitarian medical aid workers and municipal government workers; and from meetings led by members of the Ministry of Health and Population who helped measure the difficulties the various medical aid workers had in coordinating their efforts.

Spatial Progression of the Epidemic

In March 2010, the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, stated that it was unlikely that cholera would break out in Haiti after the earthquake because *V. cholerae* had not, until then, ever reached the country and because most of the foreign humanitarian aid workers came from regions where cholera was not spreading. The arrival of the disease thus surprised specialists, all

4. MSF cofounder and past president, tropical disease specialist, known for his humanitarian work.

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the more so because it did not present close to a port or in a camp for displaced persons, but along the Artibonite River.

The Artibonite River: Epidemic Epicenter

The first confirmed case of cholera was reported on October 14, 2010, in Haiti's Centre department. It afflicted a 20-year-old man living in Meille, a village spared by the January 12 earthquake and located tens of kilometers from the coast and the evacuee camps. The Cuban medical team at Mirebalais Hospital, the health center closest to the patient's village, then confirmed the appearance of an abnormal number of suspected cases of cholera (Piarroux 2010, 2) from the Meille region during the forty-first epidemiological (epi), week, October 11–17, which was the first week of the outbreak. At this point, we need to point out the importance of the medical coordination between Cuba and Haiti, in place since the signing of the 1998 tripartite accord between the two countries and WHO in response to the fall of the Duvalier dictatorship and the *Tonton Macoutes*—and not without provocation by Communist Cuba toward the US government. From that date forward, according to a (2010) *Haiti Libre* report, 417 Cuban medical workers have been on medical missions to Haiti and 625 Haitian doctors have been trained in Cuba.

After a few days, the epidemic spread to the village of Mirebalais. At first, cholera contaminated the people living along the Artibonite River and then spread progressively to other areas. According to Professor Renaud Piarroux (2010, 3) of the Université Aix-Marseille in a report mandated by the French Ministry of Foreign Affairs, this spread was more significant than the local community knew when building its water distribution system and was due to the fact that most residents drew their daily water supply from the Artibonite. The neighboring communes located upstream from Mirebalais were only affected after several days or even weeks. Piarroux's research showed that six patients from Meille fell ill between October 14 and 19, five of whom tested positive for *V. cholerae* El Tor 01. An investigation led by the team from the Centre health department indicates that the first patients got their drinking water supply from an Artibonite tributary that flows below the MINUSTAH[5] camp, where about 500 peacekeeping troops had recently arrived from Katmandu, some on October 8 and others on October 12.

After arriving on site with his team, Piarroux met with the village residents, who reported that at the time the epidemic was declared there were pipes coming out of the military camp with a foul-smelling liquid pouring from them. According to Piarroux, these pipes were gone by the time of his investigation, and

5. The United National Stabilization Mission in Haiti.

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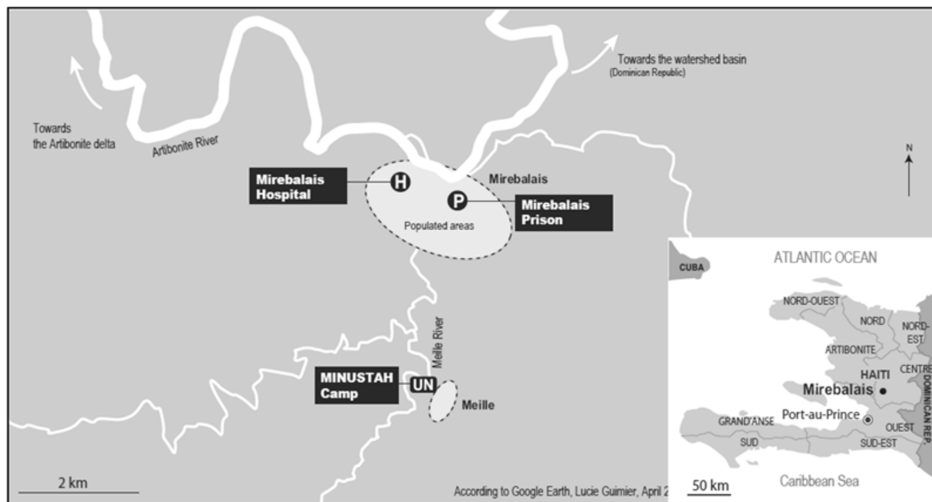
the villagers explained that the military removed them shortly after the cholera epidemic was declared. When the first investigation began, on October 19, the epidemiology team from Centre, along with doctors sent by MINUSTAH, noted pipes coming from a septic tank at the military camp spilling a blackish liquid into the river.

According to the MINUSTAH doctors, despite the cholera epidemic that was raging all around them, no soldier from the camp presented the slightest diarrheic episode and no environmental sample tested positive. These statements need to be considered carefully. It seems improbable that officers and nurses at the camp had no knowledge of the suspicion of cholera on October 12—an investigative mission had been working in a nearby village for several days. However, we must bear in mind that, although *V. cholerae* can persist for some time in their bodies, 75 percent of cholera carriers show no symptoms. Nothing points to measures having been taken to eliminate suspect fecal material and to erase the traces of a cholera epidemic among the soldiers. Moreover, suspected cases of cholera had just been reported in the Mirebalais prison, four fatal. These victims had no direct contact with outside populations, leaving as the only risk factor the prison water, which was drawn from the same tributary of the Artibonite as that implicated in the contamination of the Meille villagers.

MAP 1: THE MINUSTAH CAMP AND THE FIRST CHOLERA CONTAMINATION ZONES: AN UNDENIALBE IMPLICATION



On-site investigations came in rapid succession to study the role of the MINUSTAH in spreading of the epidemic. Two versions of facts were circulated. According to an AlterPresse (2010) report, one directly implicated the Nepalese soldiers, who reputedly dug two septic pits connected by polyvinyl chloride (PVC) pipes to spill their waste water into the Artibonite tributary near Meille. The other version also involved the Nepalese soldiers, but specified that the management of waste water at the UN camp was handled by Sanco Enterprises S.A., which used a discharge site in Meille. It would seem that the Sanco version is the most likely. According to a Radio Kiskeya (2010) report, following these accusations, on October 29 the company organized a guided visit for journalists to the Meille discharge site to demonstrate that health safety standards were complied with during the tank emptying process. During the tour a disturbing detail caught the attention of the journalists, who noticed that rocks and earth had been used to hide the incriminating septic pit that contained fecal material and flowed into the river.

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Water, a Powerful Means of Transport

The contamination of the Artibonite River poses very grave problems because it is one of the largest rivers in the Caribbean. Its source is in the Cordillera Central of the Dominican Republic and it flows through the entire island of Hispaniola before emptying into the Gulf of Gonâve in Haiti. Water from the river produces 25 percent of the country's electricity (reaching as much as 90 percent during the May–October rainy season) through the Péligre hydroelectric dam, located in the Centre department, nine (9) kilometers from Mirebalais. The river water is also used for agricultural irrigation of 40 percent of the country's irrigated land (Redon 2010, 128–129). Furthermore, as the principal means of eliminating waste, domestic use of this water is a real problem. The local population uses the river's waters for all of its needs—toilet, personal hygiene, washing clothes and dishes, and watering livestock—which makes it unfit to drink, and becomes a public-health matter. Waste water and drinking water must never come in contact. This requires infrastructure—for pumping and extraction, storage reservoirs, and a working distribution network—and also waste water basins and treatment plants regulated by strict protocols, none of which are within the financial reach of a country like Haiti.

An Epidemic along the Riverbanks

When the disease appeared in the communes of Meille and Mirebalais in mid-October, its spread increased significantly, but this fact cannot in itself explain

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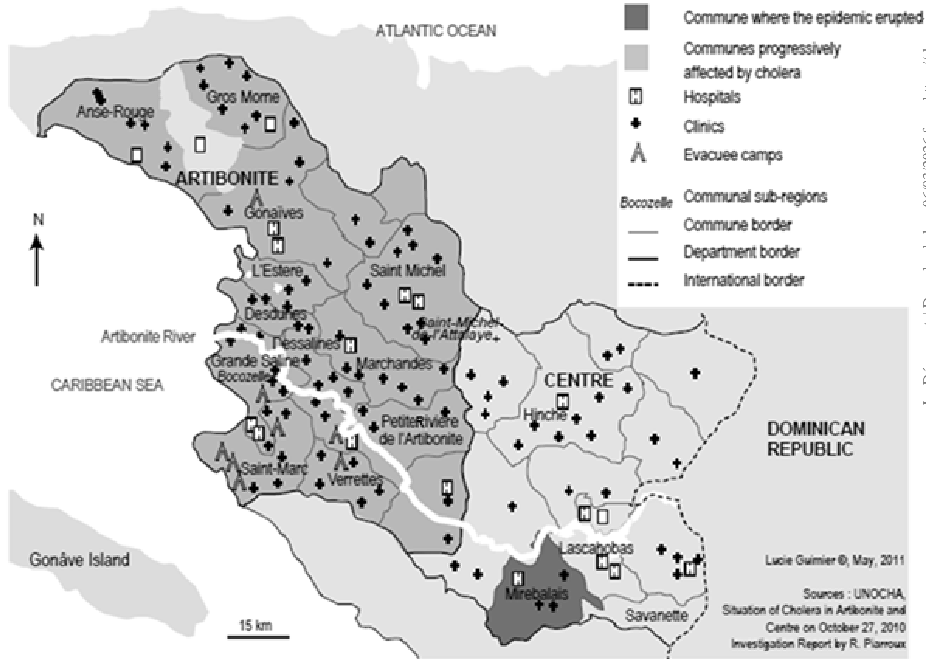
the events that occurred on October 19, when the Artibonite River became massively contaminated throughout its delta located about 100 kilometers from Mirebalais. It was an epidemic explosion. Piarroux (2004, 4) considered this a "unique event in the recent history of cholera." That day, in the six communes located along the Artibonite's banks and delta, the Artibonite health department recorded a series of alerts. During the day, three school children in Bocozelle died while in class, following acute diarrhea and vomiting with dehydration. At the same time, cases of diarrhea and vomiting were reported at Dessalines Hospital, as well as deaths reported in the commune with the same symptoms. On October 20, epidemic alerts simultaneously reached four hospitals and health clinics in the communes of Saint-Marc, Grande-Saline, Desdunes, Petite Rivière de l'Artibonite, Verrettes, and Dessalines.[6] On that day, 514 patients were hospitalized, all living in the lower Artibonite next to the river or its delta, downstream of Mirebalais; 41 of them died at the hospital while 31 additional deaths outside the hospital were recorded. The next two days would confirm the threat: almost 2,000 patients were hospitalized and 120 deaths were counted in the six communes of the lower Artibonite and neighboring communes where persons fleeing the sudden death epidemic took refuge. On October 22, there were 4,470 cases of cholera documented in 21 communes within 50 kilometers of the Artibonite delta area.

For Piarroux (2010, 5), the virulence of the emergent cases in Artibonite on October 19 can only be explained by a massive contamination with quantities of pathogens in excess of one million *V. cholerae*, likely more. This rapid proliferation extending throughout the river delta could only come from the spilling of a "phenomenal quantity of fecal matter from a large number of sick people" into the river. A few days after the outbreak of the epidemic, health workers noted populations fleeing the lower Artibonite and bringing the disease into other communes, particularly Saint-Michel-de-l'Attalaye and Gonaïves. Then direct, human-to-human transmission started, spreading the epidemic into the departments adjacent to Artibonite—Ouest and Centre, where the first cases occurred; Nord, Nord-Ouest, and Nord-Est. According to Piarroux, based on the geographic and sociological characteristics of the regions involved, this epidemic wave of fear generated three epidemiological cholera profiles.

6. The centers are as follows: Saint-Nicolas de Saint-Marc Hospital, the Drouin de Grande-Saline Health Clinic, the Desdunes Health Clinic, the Pierre Payen de Saint-Marc Hospital, the Dumarsais Estimé de Verrettes Hospital, the Charles Colimon de Petite-Rivière-de-l'Artibonite Medical Center, the Albert Schweitzer Hospital in the town of Deschapelles (Verrettes commune), and the Desarmes de Verrettes Health Clinic. The same day a suspected case is hospitalized in Gonaîves (Eben-Ezer Health Clinic). This patient actually came from Villard, a town in the Dessalines commune.

Map 2: Communes Affected by Cholera, October 27, 2010



The first profile was that of the rural communes located largely north of the Artibonite delta, which were the first to be struck by the epidemic. This is explained by the large number of residents of these villages working in the rice fields and in road construction along the Artibonite, who, moreover, fled when confronted with the unexplained deaths during the October 19–21 period. Particularly inaccessible, these communes lacked sanitary facilities and access to drinking water, which facilitated the diffusion of the epidemic contagion village by village. The ability of the medical services to contain the epidemic was hindered by insufficient means and by the incomplete organization of healthcare offered to patients. Due to lack of transportation, in the majority of cases patients walked from their villages to the clinics, and many died on the way. Thus, at Saint-Michel-de-l'Attalaye, less than one month after the start of the epidemic, more than one resident per 1,000 died of cholera, frequently before making it to the hospital. This situation, characteristic of all of

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the rural communes located between the Artibonite plain and the country's northern coast, then spread to the rural Centre communes and to the northern Ouest portions before progressively spreading to the country's southern departments.

The second profile was represented by certain neighborhoods of the coastal villages of the Nord and Nord-Ouest departments, as well as the Cité Soleil shantytown located on the outskirts of Port-au-Prince, which all experienced significant epidemic outbreaks. These were particularly disadvantaged neighborhoods with very dense populations. For the most part, these residential areas, located in flood zones, sometimes on former landfills, had especially precarious drinking water resources. Water supply in these areas is generally provided by household wells or storage tanks that are filled by tanker trucks. These private storage tanks present a high risk of contamination by dirty water buckets. Before the epidemic, water was only treated by reverse osmosis, which produced sterile water; but unchlorinated, the treatment could not prevent future contamination. In addition to ingesting contaminated water, there has been poor management of excrement in these shantytowns; defecation is generally performed outside, a practice called "flying toilets." By contrast, access to healthcare is less difficult in these areas than in rural ones.

The third and last profile involved the urban areas. These mainly included different neighborhoods in Port-au-Prince along with the evacuee camps, which, while affected, did not experience as great an epidemiological outbreak as in the rural areas. In fact, the situation was rapidly controlled and healthcare facilities were already in place that helped anticipate the epidemic. Occupants of the evacuee camps in fact had easier access to water and sanitary equipment, which were often superior to those in the shantytowns. The camps were the particular focus of epidemiological monitoring after the earthquake, supported by the CDC. Thus there was no major cataclysm in the camps or the shantytowns, due to the ever-growing medical response after the cholera outbreak.

A Calendar Favoring Contamination

The epidemic spread quickly. The first days of the contamination were the deadliest due to the problematic sanitary conditions and to other factors as well.

Did Hurricane Thomas Accelerate the Spread of the Disease?

The cholera epidemic started in mid-October, during the last phase of the May–October rainy season in Haiti. This was a positive factor for containing the disease, as Gérald Serve, program director for the NGO ACTED, explained: "the disease

arrived at the end of the hurricane season and all of the health education and contingency systems were already in place."[7] Nevertheless, climate hazards are, by nature, unpredictable, and the arrival of Hurricane Thomas nearly 20 days after the cholera outbreak, on November 5, aggravated the health situation. The passing through of Thomas had heavy consequences on the Haitian territory and particularly in Artibonite where several neighborhoods in Gonaïves—easily vulnerable to bad weather—were flooded at the same time that the village had a large number of cholera victims. Heavy rains caused the rivers to overflow their banks, which accelerated the transmission of disease. At that time, unsafe water flowed through the streets from the flooded latrines and sewers. The epidemic thus spread freely into as-yet-unaffected areas where the population had not known of the problem.

Humanitarian logistics also suffered from these weather conditions. The flooding cut off access to certain locations, slowing a return to caring for the sick. If the hurricane did not produce the predicted loss of life and property damage—it caused 21 deaths—it did allow the disease to spread rapidly, as described above. By that time cholera had caused 500 deaths and infected more than 7,000 people.

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What Healthcare Facilities Best Handle a Cholera Outbreak?

Cholera Treatment Centers: Indispensable Facilities

While epidemics were expected after the earthquake, doctors in Haiti, humanitarian or local, were not prepared for cholera, as Romain Gitenet, Doctors without Borders' (MSF – Médecins sans frontiers) head of mission in Port-au-Prince, explained:

It is a disease that didn't exist before; there were maybe cases a hundred years ago, but none proven [. . .] plus, it had been eradicated in the Caribbean. So it was a disease that no one knew; everyone was afraid of it; added to that, doctors did not know how to treat it, having never met it, nor was there any resistance to it within the population because there had been no prior cases.[8]

Since cholera is highly contagious, patients cannot be cared for in hospitals. This would bring them into contact with internal medicine or surgery patients who could become infected. Cholera patients have to be isolated, without hampering daily medical activity and taking away from regular services, which could well lead to deaths due to lack of medical personnel.

7. Interview with Gérald Serve, Port-au-Prince, February 25, 2011.
8. Interview with Romain Gitenet, Port-au-Prince, March 2, 2011

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Patients are thus received in a cholera treatment unit (CTU), which provides initial care to patients presenting with symptoms and directs the most serious cases to a cholera treatment center (CTC), where patients are isolated. They are placed in special beds with bags placed underneath to collect patient stools. On arrival, patients are treated orally with rehydrating salts, and the most seriously affected receive intravenous rehydration. CTCs require rigorous sanitary controls: disinfection with chlorinated water is provided when patients arrive, cleaning teams are responsible for regularly disinfecting the treatment area, contaminated waste is incinerated and/or buried, and a supply of chlorinated water is required for treatments administered to patients. Once treated, patients recover rapidly in the majority of cases.

By the end of 2010, there were 95 CTCs[9] operating throughout the territory. By April 26, 2011, only 56 remained, signifying a significant reduction in case numbers. While these facilities can be set up fairly quickly, an important question still remains: where to locate them?

What Space Is Available for These Facilities?

Fear of contagion rapidly invaded people's thoughts. On December 23, the Ministry of Culture and Communication reported 45 fatal lynchings since the start of the epidemic. The victims were largely voodoo preachers, "beaten with machetes and stones before being burned in the street" (*Haiti Libre* 2010). They were accused of sorcery and of having spread cholera with the aid of a powder. These are unsettling facts, all the more so because they occurred in a specific place: the department of Grand'Anse and certain communes on the Central Plateau. Why in this particular location? During our interview, Professor Piarroux explained that the start of the epidemic was explosive in this region, which may help explain the uncontrolled acts of panic by the population. In addition, the number of evangelical organizations present in Haiti to refute the practice of voodoo explains the mobilization of crowds of strong believers fearful of the disease. Today, in a society that was until recently 80 percent Catholic, evangelical and Pentecostal Protestants represent 40 percent of Haiti's population, reaching 60 percent in the shantytowns (Goulet 2004, 4). Finally, the fact that the source of cholera had not been clearly explained to the population and that the UN had initially denied its involvement in bringing in the disease—suggesting its source might never be known—contributed to mystification of the disease. If the epidemic served as a pretext for attacks against voodoo practitioners in a majority-Catholic country, these acts are significant indicators of the fear that cholera provoked among Haitians.

9. MSPP web site, list of CTCs on December 31

In such a context, setting up healthcare facilities was quite a challenge. Residents at first refused to have CTCs established near where they lived, a refusal that was even stronger in the evacuee camps. Moreover, because CTCs cannot be placed directly in hospitals, they had to be established in unoccupied areas. Therefore, their location was not made according to the needs of the most affected, but as a function of available space, as close to hospitals as possible. Finally, prior to their installation, the CTCs required the approval of the Ministry of Health and Population as well as the mayor of the commune in question.

Treating Cholera: The Role of NGOs, and After?

Setting up healthcare centers requires more treatment personnel. Three months after the start of the epidemic, MSF alone had trained 1,500 Haitian medical employees and deployed 135 foreign nationals.[10] Training local personnel with humanitarian NGO workers met two needs: to supplement the insufficient number of staff within the NGOs, and to transfer knowledge so that, little by little, local personnel could take on the responsibility for treating the epidemic. However, this transfer raises the major question of who pays the personnel after the NGOs leave. In March 2011, with the decrease in the number of cholera cases, some NGOs gradually left the CTCs. This departure inevitably raised concerns about the capacity of the treatment centers and local personnel to handle any possible resurgence in case numbers, in view particularly of the imminent onset of the rainy season in May. According to the MINUSTAH sector group health bulletin,[11] while the NGOs had declared their willingness to continue to monitor the situation and were ready to return if needed, the problem of local personnel salaries and the threat of strikes was already affecting the regular care for patients seeking medical treatment. Knowing that the government was not in a position to finance such personnel, certain departments hoped to receive commitments from the World Bank and started to look for financing partners.

Importance of Healthcare Access

The cholera epidemic developed in Artibonite from the Centre department, two departments that were among the most deficient in access to healthcare. Artibonite is adjacent to Nord and cholera spread quickly among the Nord's dense population.

10. Interview with Romain Gitenet, Port-au-Prince, March 2, 2011.
11. "Cholera and Post-Earthquake Response in Haiti," March 28, 2011.

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With the early days of infection being the most deadly, it is not surprising that regions close to the outbreak of the epidemic were severely affected. The fact that Grand'Anse is isolated and distant from the capital department may explain the strong impact of the epidemic in this region due to lack of access to healthcare.

The regions recording the highest number of hospitalizations due to cholera—Port-au-Prince and the departments of Nord, Artibonite, and Ouest—are densely populated and urbanized, which can explain this level of impact. At the same time, other less populated and more isolated departments may have had a large number of cholera cases that went unreported due to the lack of healthcare infrastructure. Overall case fatalities indicate the places where treatment was most effective, and the ratio between the number of hospitalizations and the number of cholera deaths was lowest in Port-au-Prince. If the capital experienced a larger number of cases, it was also the area that saw the lowest number of fatalities in relation to the number of hospitalizations. Ouest, Centre, and Artibonite almost identically benefitted from on-site care provided by various NGOs. Conversely, the departments of Sud-Est, Grand'Anse, and Nippes suffered from insufficient medical care. Thus, efficient study of the incidence of cholera in the different areas of the Haitian territory must consider the level of isolation and access to patient care.

Access to a variety of healthcare services is clearly easier in an urban rather than rural setting. This is particularly true of the Port-au-Prince metropolitan area. In fact, while 99 percent of the capital's residents require less than half an hour to reach a hospital, 19 percent of the women of other cities and 54 percent of women in rural settings travel one hour or more to reach a healthcare center. The majority of existing care facilities are located in the Ouest department. Furthermore, access to care is constrained by the need to travel long distances to reach them. According to the results of "Enquête Mortalité, Morbidité et Utilisation des Services" (EMMUS III – Mortality, Morbidity, and Use of Services) a survey of the health of women and children in Haiti published by the Ministry of Health and Population (MSPP – Ministère de la Santé Publique et de la Population) under the aegis of the Pan American Health Organization (PAHO), only about a quarter of women, or 29 percent, live less than five (5) kilometers from a hospital; 40 percent have to travel 15 kilometers or more to access healthcare facilities.

International Aid Issues in Cholera Management

Commonly called the "Republic of NGOs," Haiti has seen the number of NGOs increase in its territory since the end of the 1980s, a period of significant political instability. The earthquake only magnified the presence of international actors in

Port-au-Prince, the principal disaster area. The upsurge of the epidemic in the capital, feared by humanitarian, medical, and epidemiological groups when cholera arrived in October 2010, never happened. The presence of numerous humanitarian actors responding to the earthquake allowed rapid containment of the epidemic in the capital. In addition, fears of an outbreak in the evacuee camps were unfounded. Healthcare facilities had been established there by the various NGOs, which rapidly equipped them with water and sanitation systems, helping to contain the epidemic.

While the Ouest department is home to more than a third of the country's population (3,664,620 inhabitants out of a total population of 9,923,243 in 2009[12]), this region experienced a significant influx of humanitarian aid after January 2010, with numerous NGOs already in place at the time. This aid deployment to Ouest, and particularly to Port-au-Prince, underscores the inconsistencies in international aid in managing cholera. Dr. Unni Karunakara, international president of MSF, stated: "while substantial aid is concentrated in Port-au-Prince, the rural areas, where cholera was raging and which had inexperienced healthcare personnel, only received paltry support" (Karunakara 2010). With Ouest better supplied than others in terms of health infrastructure, the arrival of medical NGOs to provide aid to the affected population only magnified this privileged position.

If this increase in aid was a positive thing, it nevertheless reinforced the inequality of access to healthcare for Haiti's people. Access to primary care is most lacking in rural areas generally. This is particularly so in Artibonite and Centre, departments that took in earthquake evacuees because of their proximity to Port-au-Prince in Ouest; by February 6 following the earthquake, Artibonite had 62,509 displaced persons and Centre 90,997.[13] Thus relocated temporarily after the earthquake, these populations would gradually be able to return to the capital and find jobs not available in the countryside, and, further, to benefit from reconstruction efforts. However, it is likely that in October, when cholera broke out, many residents of Port-au-Prince were still living in these two departments.

Disparities in the Capital's Urban District (Ouest Department)

Evidence of Ouest's greater access than other departments to primary healthcare does not imply uniform access for all Ouest residents, including in particular those living in the greater metropolitan area. Just as rural areas have very limited access

12. Institut haïtien, "Population totale," 10.
13. OCHA, Map of Displaced Persons on February 6, 2010.

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to primary healthcare compared to the metropolitan area, certain zones within the capital are also excluded from Haiti's healthcare system, namely the shantytowns.

The Shantytowns: For the Most Part Spared by the Earthquake—and Overlooked by International Aid

Port-au-Prince has more than 350 shantytowns (Goulet 2004, 2) where 1.8 million people (out of 2.5 million total) live in overcrowded conditions. Some shantytowns, those with dwellings built of durable materials (e.g., concrete) and often multi-storied because of overpopulation, were hit hard by the earthquake, whereas most of the sprawling shantytowns made up of low structures with corrugated tin roofs had limited earthquake damage. These areas were thus on the margin of humanitarian aid, which was mainly concentrated in the evacuee camps. The earthquake did not seem to disrupt the life of residents in the shantytowns—there was no infrastructure to disrupt: no aqueduct, sewers, or road systems. Public health problems were nothing new to the shantytowns, where collection of waste and access to drinking water were absent. With no latrines, residents relieved themselves out-of-doors, a vulnerable source of infection in the cholera epidemic. In mid-November of 2010, Caroline Seguin, head of the MSF cholera mission, confided her dismay: "Our main worry is much more with the shantytowns than the evacuee camps, even if some cases have been reported here and there" (Talles 2010). At that time, the majority of patients surveyed in Port-au-Prince CTCs did in fact come from the shantytowns.

The territorial distribution of these precarious areas may also explain why some were overlooked by international aid groups. Some shantytowns are located on the outskirts of the city or on the hillsides of Morne-de-l'Hôpital, the huge mountain that dominates Port-au-Prince; or they have spilled out to the coastal marshlands such as Cité Soleil—the largest single shantytown in the Caribbean, home to 300,000 people. Systems for the distribution of drinking water through water fountains have been in place in some areas for several years, but, during the cholera outbreak, the people in these vulnerable zones (unlike evacuees in camps) did not benefit from the distribution of chlorinated water or from the water and sanitary programs set up by the NGOs.

Medical Aid Concentrated in the Port-au-Prince Evacuee Camps

The fact that the evacuee camps were far less affected by the epidemic tends to confirm the relative effectiveness of sanitary and nutrition measures put in place for their displaced populations and may explain the evacuees' greater resistance to

cholera. The situation in the camps is easy to understand. They were built by the international aid community after the earthquake and thus immediately the focus of concern of the aid workers present in Haiti who quickly distributed drinking water and food and installed latrines. Notwithstanding that promiscuity, lack of privacy, the proximity of latrines to victims' tents, and squalor were all factors of concern for the evacuees in the Port-au-Prince camps, the presence of international medical aid in the camps prevented major spread of cholera.

How Was the Battle against Cholera Waged?

It is difficult to understand exactly how the battle against cholera was waged because differentiating official data from actions that took place on the ground is complicated. At government level, the key authority was the MSPP. To contain the epidemic, the ministry worked with the National Department for Potable Water and Sanitation (DINEPA – La Direction Nationale de l'Eau Potable et de l'Assainissement), which quickly increased chlorine levels in the water distribution networks to eradicate *V. cholerae* bacteria. The MSPP progressively rolled out several phases of response to the crisis. First, the minister of health established an emergency team to evaluate the problem. Then, all actors in the health community were contacted to assess available supplies to combat the disease. Finally, health workers came together to consider the appropriate response. The analytical phases were carried out in close collaboration with the international aid groups.

A Local Public System Fueled by External Capital

As explained to us by ACTED's Gérard Serve, Haiti's national system was efficient on a small scale but, to work nationwide, the MSPP needed help from organizations like the Red Cross, the Haitian community healthcare networks, community activists, NGOs, and associations. According to available written information, it was evident that for a failed state the public authorities like the MSPP and DINEPA had successfully responded to the cholera crisis and were exceptionally well organized through alliances with all available organizations. However, the weaknesses quickly become clear. DINEPA, as the public authority in charge of drinking water and thus responsible for distributing chlorinated water to the various sites chosen with NGOs (53 sites in Port-au-Prince in March 2011) is not funded by government, but rather by lending institutions like the Inter-American Development Bank (IDB) and the Spanish government, which is very involved in the water sector in Haiti through a fund devoted to water and sanitation established for Latin America and the Caribbean.

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In addition, out in the field, DINEPA could not operate alone. It needed the assistance of NGOs involved in the water sector. Thus, if the government seems to have efficiently established an emergency plan against cholera, it still remains that the public Haitian organizations quickly showed their limitations for several reasons. For one thing, Dinepa is a young organization, created in March 2009, which may explain its limited ability to act. Furthermore, the amount of external financing it receives makes it seem like an at-risk organization. Finally, internal corruption threatens the credibility of the organization, which nonetheless seems to play an increasing role in Haitian society. With the crisis situation stabilizing, the NGOs will gradually delegate their work to public institutions like DINEPA. But with a public system dependent upon these organizations, one can predict that management of the cholera health crisis will be faced with internal problems.

In 2005, the UN introduced the idea of sector responsibility in humanitarian reform, using the term "cluster." The goal was to improve management of the different crises that involve the UN. The clusters, or humanitarian meetings, under the aegis of the UN Office for the Coordination of Humanitarian Affairs (OCHA), allow the various actors to establish a phase to evaluate the measures to be undertaken. In the case of cholera, this involved distributing sanitary products—chlorine, soap, drinking water—and determining the areas in need of CTCs and CTUs, and oral rehydration centers. These meetings formed Haiti's landscape of humanitarian aid. They seem indispensable viewed from outside, since they are supposed to bring together all actors in the same sector to coordinate aid on the ground. However, apart from relaying basic information and adopting measures in urgent situations, which by definition evolve quickly, these meetings do not provide technical support and are mostly oriented toward communication, without providing any real coordination among the different actors. The clusters thus represent the dysfunction of the humanitarian aid system in Haiti, where donors looking to assert their political and economic influence through the financing of humanitarian aid are not without self-interest. It seems only marginally realistic that such meetings could produce a harmonious organization. Since the earthquake, the single health cluster included more than 420 organizations (Karunakara 2011). In addition, this sector coordination operates mainly between the international partners and often omits local or national aid organizations. The population is also excluded from the process, which underscores risk of social and political tensions. Furthermore, as stated by François Grünewald (2011), director of Groupe URD (Urgence Réhabilitation Développement), "the significant level of dissatisfaction among the populace with humanitarian aid and the role of the Haitian government, the interplay among actors associated with the troubled phases of the past, all contribute to creating a potentially volatile context which we need to monitor very carefully."

International Aid Breaking the Back of National Institutions

One of the questions posed in this research concerned the public and private health system in Haiti facing medical aid from humanitarian organizations. The Haitian health sector inevitably suffered in comparison, given the free services offered by these organizations. Grünewald (2011) emphasizes this, explaining that since the arrival of humanitarian aid, "several hospitals and schools in Port-au-Prince are now in bankruptcy and the mechanics of access to care need to be completely rethought." Before the earthquake, Port-au-Prince benefited from several different types of assistance in the health sector. The first came from the private sector, which contributed some 20 medical facilities (hospitals, health clinics, and test centers). These offered quality healthcare but at prohibitive rates that prevented 80 percent of the population from accessing the services (Gouzerh 2010). In contrast, the public services offered an ineffective alternative with faulty equipment, often short of personnel, and a cost-recovery practice with little oversight. As in many developing countries, donors already involved in Haiti before the earthquake chose to favor the private health sector to the detriment of the public sector, while at the same time financing some of the NGOs delivering basic services, so as to ease the exclusion of the great majority of Haitians from care.

Two things changed the pre-earthquake, healthcare scene: the massive influx of NGOs and the recruitment of qualified human resources nationally. The NGOs offered outlandish salaries compared to Haiti's norm. This deprived the local facilities of their best doctors. In key ways the medical NGOs provided a safety net in their capacity to help the poorest patients that could not count on public facilities. As such, it cannot be denied that, thanks to the medical NGOs, access to care for the most destitute population has considerably improved since the earthquake. Nonetheless, the influx of NGOs was characterized by massive contributions from people in their home countries (which exceeded the most optimistic expectations), allowing a number of them to do without traditional donor-based financing and thus avoid any monitoring by the Haitian government, the United Nations, or individual lending institutions. This led to a helter-skelter approach to healthcare, with no thought to preexisting health structures, and to spontaneous and short-lived collaborations with private or public partners. As for the private, Haitian medical facilities, they immediately responded to the post-earthquake emergency by dispensing free care to the population. The financial consequences to the sector were soon evident—to the extent that operating for several months free of charge has resulted today in some of them being unable to pay their bills. In the long term, part of the healthcare offer is at risk of disappearing and, even if this situation only involves

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a minority of Haitians, it reflects the problem of poor on-site management by the international medical NGOs.

Currently, NGOs are close to running out of money from individual contributors and will have to apply to the lending institutions, which respond more to utopian demands than pragmatic ones. To achieve change, the health sector in Haiti must take advantage of the bilateral or multilateral cooperation credits, and it is not surprising that the governments offering aid are mainly located on the American continent—Brazil, Venezuela, Cuba, United States, Canada. Situated right on the border line between North and South America, Haiti represents a challenge in terms of the media and political representations from within these different countries. Agreements have recently been signed between the MSPP and Cuba (already active for several years in improving the Haitian health services, as mentioned above) and between the MSPP and Brazil. These agreements are likely to bolster public services in creating a new health map for the Haitian capital.

Consequently, NGOs have shown only informal concern for the survival of the private health system in Haiti, as explained by Gitenet:

> Before, there was a more structured private system, but there were two kinds of private systems. One was contaminated with frequent post-op infections, and there was a private system that worked much better with acceptable hygiene and some medical knowledge. There were the two systems, with the better one for the rich. The super-rich sought care in Miami. The private system was not very well regulated or monitored. It collapsed after the earthquake and was difficult to reestablish. Many NGOs arrived and offered free healthcare. The problem is that we are only talking about primary care, not secondary care, although this is where we save lives. And the mortality rate is essentially from hospitalization, surgery, medical emergencies, not the minor cases of a general practitioner who goes on house calls. We did a lot of that after the earthquake and we got out of that.[14]

But in Haiti the current challenges stem from a crude competition between the backers of privatization as a specific development model and those in favor of public services able to offer care to the most vulnerable. The active lobbying of certain private hospitals against the NGOs, as the MSF head of mission in Port-au-Prince explained, constitutes a strategy to attract the favorable attention of donor institutions. In sum, political choices are currently playing out in Haiti and the future will show whether these decisions have taken the people into consideration or have only responded to the government's desires.

14. Interview with Romain Gitenet, Port-au-Prince, March 2, 2011.

Conclusion

This interpretation of the cholera epidemic in Haiti takes into account a particular combination of natural, social, and spatial data then at work in the country. Significantly weakened by the January 2010 earthquake, the Haitian space played host to thousands of international aid partners in a short period of time—and without establishing effective sanitary measures, a situation that at that precise moment favored the rapid spread of the disease. The inability of Haiti's government to handle such an extensive epidemic led thousands of NGOs to appropriate the cholera issue. This led to scattered initiatives focused on single projects and lacking significant coordination in a crisis context. The absence of a clear, national, response framework has led to an ambiguous situation with limited efficacy. It appears that the various organizations present in Haiti sometimes perform complementary tasks, are often rivals, and, moreover, must deal with Haiti's public bodies and, especially, stand up to them.

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