

Environmental and Health Issues in Haiti

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ABSTRACT

This article discusses environmental factors as they relate to public health in Haiti. Two environmental factors that affect Haiti's public health are its inadequate infrastructure and its lack of resources. Lack of resources is exacerbated by Haiti's escalating population — which in turn diminishes a healthy sustainable environment — which, in turn, causes further deterioration in public health. Haiti's January 2010 earthquake further contributed to the country's public health problems.

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Background

The small island of Haiti currently has an estimated population of 9.2 million that is compressed in a land mass approximately the size of Maryland (New York Times, 2010). Haiti is well known for being the poorest country in the Western Hemisphere, and more recently, for the 7.0 earthquake in January 2010 that destroyed much of the capital city.

Haiti's past is plagued with bloody revolts, disease, famine and natural disasters. American school children are familiar with this history: "*in 1492 Christopher Columbus sailed the ocean blue.*" What American schoolchildren are less likely to know is that when Columbus arrived in the Caribbean, there were native inhabitants. Columbus lost direction and landed in the Caribbean, thinking that he had landed in India. In honor of Spain, he called this place Hispaniola, which 200 years later became known as Haiti (Thomson, 2000). When Spain began to build its first colony in the New World on the North Coast of Hispaniola, it was named "La Navidad."

In 1697 the island was divided by the Treaty of Rywich. The Spanish would control "Santo Domingo" and the French were given "Saint-Domingue." Over the next 100 years the French colony realized huge profits as slaves were imported to harvest sugarcane, cotton, and coffee. At the height of the sugar cane plantation trade, there were over 500,000 African slaves, making Saint-Domingue France's most valuable territory (New York Times, 2010).

Traditionally slaves in the Caribbean endured the harshest treatment and conditions. The slaves of Saint-Domingue were literally worked to death. Because the slaves realized that they outnumbered their slave masters 15 to 1, on the night of August 22, 1791 they revolted in a bloody war that lasted for 13 years. By 1803 the Haitian flag was created and Haiti was established as the first nation independent from

European slavery. Thereafter, Haiti was cut off from the rest of the western world, due to fears that slave revolt would spread (Thomson, 2000).

Over the next 200 years Haiti underwent many changes that resulted in the island being divided into Haiti and the Dominican Republic. This history is significant to Haiti's present-day problems. The instabilities of infrastructure, corrupt governments including dictatorships — along with natural disasters — are major factors contributing to Haiti's history of health and environmental problems (Tunzelmann, 2009).

Even before the January 2010 earthquake, Haiti had been a public health disaster with its combined health and environmental issues. Due to this country's history, political instability, and lack of resources, the people have suffered from curable or preventable diseases. Geographically, this country lies on a fault line and is in the path tropical storms.

It is important to look at the interrelationships among population, health, and environmental factors when assessing Haiti's vulnerability (World Health Organization, 2010):

- The relationship between growing population the stress it puts on the environment — e.g., deforestation, lack of arable land, settlements on fragile slopes or floodplains;
- The relationship between environmental health and human health — including water quantity, water quality, and nutrition; and
- The relationship between unstable infrastructures and the unstable political atmosphere — which leads to inadequate medical services (Figure 1).

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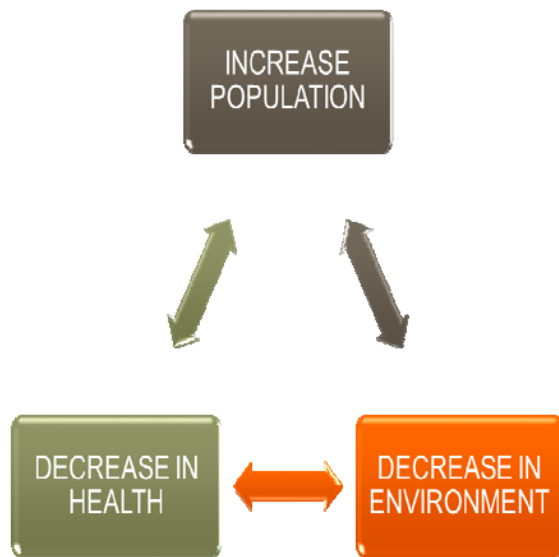


Figure 1. The Reciprocal Relationship among Overpopulation, Decrease in a Healthy Environment, and Decrease in Health of the Population.

Risk Factors in Haiti

Due to Haiti's extreme poverty there are many factors that put this population at high risk. In addition to poverty, risk factors that will be discussed are Haiti's environmental issues, its incidence of tuberculosis (TB), incidence of HIV, its unmet need for family planning, and urbanization.

World Health Organization [WHO] data demonstrate why Haiti is at such risk for poor health and how this problem is increasing (WHO, 2010). Table 1 shows the distribution of poverty, inequalities, and health in Haiti. As one can see from these data, public health officials have many challenges, especially in light of the January 2010 earthquake. These data were gathered prior to the earthquake, and therefore, do not reflect how these risk factors have been further exacerbated.

Population Trends

According to the WHO (2010), Haiti has an estimated population of 9.2 million people with an annual growth rate of 1.8%. It must be pointed out that these data were gathered before the 2010 earthquake (an estimated 230,000 Haitians died in this disaster). Nevertheless, this population is growing rapidly and projected to be up to 70% larger by the year 2050. Haiti has a young population with 41% 0-14 years of age. This country also is one of the most densely populated countries in the world with an average of 270 persons per square mile. (WHO, 2010) A young population that has not yet

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reached child-bearing age could be a real problem with a continuing decline in medical services due to the earthquake. Health-related facts about Haiti include (Central Intelligence Agency, 2010):

- Women have an average of 4.9 children each;
- 47% of the total population is undernourished;
- 17% of children under age 5 are moderately or severely underweight; and
- 21% of infants have low birth weight.

A majority of these issues center on the lack of family planning and a lack of medical resources. Because of voodoo practices and traditional beliefs, social taboos discourage treatment by western doctors. Many barriers limit women's access to family planning methods, including gender inequality, myths, religious beliefs, and lack of knowledge about available services. Services – consisting of health centers and district hospitals – are primarily clustered in urban areas. With an unstable government and inconsistent funding, there is a continuing deterioration of health services (Kidder, 2009).

Women from the lowest socioeconomic level in Haiti have twice as many children as they would like to have. These women have had even more difficulty accessing services as a direct consequence of the earthquake. Even before the earthquake medical priority shifted away from reproductive health services—focusing more on HIV and TB (Kidder, 2009).

Environment and Land Use

Table 2 illustrates the vast differences in health statistics between Haiti and the Dominican Republic – two nations that share the same island (Hispaniola), climate, and natural resources. Health statistics from the United States are also listed as a reference. Life expectancies is considerably lower and infant/maternal mortality is markedly higher in Haiti.

Haiti's population is plagued with many environmental issues. A combination of poor agricultural planning and natural disasters, deforestation, and soil erosion are huge obstacles to overcome. Poverty forces many Haitians to turn to trees as a source of fuel in homes. Once trees are cleared, tree roots no longer hold soil in place on slopes. Flash floods during the two rainy seasons cause even more erosion, washing away topsoil and making agriculture even more difficult (Chiyoda-ku, 2002).

Two-thirds of Haiti's agriculture is small-scale subsistence farming which barely feeds the farmers,

Table 1: Haiti's Distribution of Poverty, Inequalities, and Health

<i>Categories</i>	<i>Haiti</i>	<i>Regional Average (Including the U.S.)</i>
<i>Gross National Income per capita</i>	1,150	22,868
<i>Life Expectancy Women</i>	64 years	78 years
<i>Life Expectancy Male</i>	59 years	73 years
<i>Adult Mortality Rate</i>	278	127
<i>Prevalence of HIV in adults per 100,000</i>	1823	445
<i>Prevalence of TB per 100,000</i>	366	38
<i>Contraceptive Use</i>	32%	70%
<i>Success with DOTS system</i>	82%	75%

**These data was gathered by WHO in 2009 for “Data from the Global Health Observatory” (World Health Organization, 2010)

Table 2. Health Statistics of Haiti, the Dominican Republic, and the United States

Health Statistic	Haiti	Dominican Republic	USA
Life expectancy at birth (women)	55 <i>years</i>	70 <i>years</i>	80 <i>years</i>
Life expectancy at birth (men)	52 <i>years</i>	64 <i>years</i>	75 <i>years</i>
Child mortality	108 <i>per 100,000</i>	32 <i>per 100,000</i>	8 <i>per 100,000</i>
Maternal mortality	523 <i>per 100,000</i>	80 <i>per 100,000</i>	8 <i>per 100,000</i>

Note: These data were gathered by the USAID organization in 2006 (USAID, 2009).

doing little to feed the remaining population. Soil is depleted because these farmers replant the same crop over and over again (Kidder, 2009).

Clean Water

Even though Haiti has no shortage of water, it lacks clean drinkable water. In the 2003 world poverty ranking, Haiti ranked 147th (out of 147) in the percentage of the population with access to potable water (Chiyoda-ku, 2003).

The Pan American Health Organization (PAHO) reported that more than half of all deaths in Haiti were due to waterborne gastrointestinal diseases. Haiti now has the highest infant mortality rate in the western hemisphere (Morgenstern, 2004).

Because of its location in “Hurricane Alley” Haiti is in the pathway of some of the Caribbean’s worst tropical storms and hurricanes. High volumes of rain cause flash floods that wash away topsoil and contaminate water supplies (Tunzelmann, 2009).

In 1967, the government developed the Centrale Autonome Metropolitaine d’Eau Potable (CAMEP) with the goal of providing clean water for citizens. CAMEP is responsible for providing water to the Port Au Prince area. However, only about 25% of this area’s population is served. SNEP (Service National d’Eau Potable) is in charge of supplying water for the rest of the country. However, potable water reaches barely 20% of this population. Water infrastructure throughout Haiti is deteriorated and inadequate, and drinking water is already too expensive for most of the population (Morgenstern, 2004).

In late 2009 the water agency SNEP was reorganized and renamed National Directorate for Water Supply and Sanitation (DINEPA). There is much debate about how to reorganize the water system to increase access to the population in both urban and rural communities. Allowing a for-profit private company to expand and improve the inadequate water treatment infrastructure and then provide water only to those who could pay for access is impractical – given that most of the population cannot afford to pay now, and certainly could not pay even higher water prices charged by a private supplier (Morgenstern, 2004).

Even former President Jean-Bertrand Aristide vetoed proposals for privatization of the water supply system. Privatization of the system would mean increased water prices, but some believe that it is the only way to secure the level of funding needed to rebuild and expand water infrastructure (Kidder, 2009). The issue of privatization was the debate before the 2010 earthquake. Now that the earthquake has damaged or destroyed the already-deteriorated

water and sanitation system, experts believe this is a good time to completely rebuild the system.

HIV

Since the outbreak of the AIDS epidemic in the 1980s there were some groups classified as high risk even before the disease was clearly understood (Kidder, 2009). In 1987, President Reagan would not allow HIV-positive individuals to enter the U.S. Because of Haiti’s extreme poverty and illiteracy, experts were concerned that the epidemic would cause pandemic fatalities in Haiti (Kidder, 2009).

The United Nations (2004) predicted that if work was not carried out to prevent to spread of HIV, by the year 2015, 10.5% of the population would be infected. As HIV education and healthcare programs were implemented in Haiti, HIV rates decreased from 3.8% to 2.2 % of the population (WHO, 2010). However, in the earthquake, eight hospitals near Port-au-Prince, the capital of Haiti, were either damaged or destroyed. Other medical facilities are now overwhelmed in treating survivors of the earthquake. With all the destruction, HIV and AIDS patients find it difficult to access their medications.

Multiple Drug Resistance Tuberculosis

The only infectious disease in Haiti that is as troubling as HIV/AIDS is tuberculosis (TB). According to the WHO, TB is Haiti’s second highest disease in morbidity and mortality of both youth and adults, resulting in 6,814 deaths in 2007 (Kidder, 2009). Programming and implementation have recently focused on finding the link between mortalities of HIV patients who contract TB by using direct observational therapy (WHO, 2010).

A for a more aggressive form of TB – Multiple Drug Resistant (MDR) TB – has emerged in the Caribbean and Latin America. This disease manifested itself after a typical TB strain mutated – when a TB patient started but never completed a regimen of medicine. (USAID, 2009) This aggressive form of TB was more or less created by man and the disease’s ability to adapt to medical insufficiencies. When patients would have a chance to get some type of medical intervention they would be challenged to completely finish the medication. MDR TB was caused by a variety of problems, such as inconsistencies in medical facilities, lack of medicine, lack of training by the medical worker, lack of educating the political instability, cost, illness (having the strength to walk to medical facilities) or non-adherence to treatment by the patient. Because of Haiti’s high prevalence of HIV/AIDS, it has created a breeding ground for MDR TB to spread. For instance, an HIV patient presents with a case of TB and seeks treatment for medication. After a few

weeks of taking the medication, due to political unrest, the supplies cannot reach the facility the patient will miss his treatment. These continued interruptions eventually lead to the patients TB to partially treated and mutated. This strain then becomes immune to normal regimens of medication and thus Multi-Drug Resistant (USAID, 2009). There are many organizations such as USAID that have worked to decrease the prevalence of MDR TB, but one man in particular has been there since the beginning.

Dr. Paul Farmer and DOTs

Dr. Paul Farmer has worked in Haiti since the 1980s. He initiated a direct observational therapy (DOT) program that ensured that patients would start and complete the correct regimen of medication. He was innovative in his approach to educate, hire and train local health workers to perform the task of administering the medication. Local people were in charge of walking to patients' houses and directly observing the taking the medication (Kidder, 2009).

In 1987, Dr. Farmer opened Zanmi Lasante – which has grown from a one-building clinic in the village of Cange to a multiservice health complex. This complex includes a primary school, an infirmary, a surgery wing, a training program for health outreach workers, a 104-bed hospital, a women's clinic, and a pediatric care facility. In this facility, Dr. Farmer has pioneered the treatment of both multi-drug resistant tuberculosis and HIV in Haiti (USAID, 2009).

The Earthquake of 2010

The earthquake took place on January 12, 2010 at 16:53 local time, The epicenter was near Haiti's capital, Port-au-Prince. It was measured at a 7.0 magnitude on the Richter scale which was the biggest earthquake ever recorded in Haiti. An estimated 230,000 people died. One of the reasons that it was such a horrific disaster is that the area struck was home to more than 3.5 million people (Associated Press, 2010).

For days after the first earthquake aftershocks that measured up to 6.0 in magnitude followed. These phenomena made the residents even more fearful to search for victims trapped in the rubble. Because the epicenter was such a highly-populated area, much of the infrastructure that supplied basic needs to the population was destroyed - power, water, sanitation, communication, and medical facilities suffered severe damage (Associated Press, 2010). Because it occurred in the afternoon – a peak time of day when employees would be present – many hospital and agency staff were killed or severely injured.

Transportation routes were destroyed, further delaying rescue efforts (WHO, 2010).

In the aftermath, the United Nation's first priority was to search and rescue as many people as possible. NGOs, NPOs and other organizations came to help with the effort to rebuild and serve as emergency services. While these organizations rescued people, others provided healthcare workers to help prevent infections and tend to injuries. The U.N. also organized and provided basic necessities – food, clean water, and shelter – while to trying to coordinate overall efforts (Associated Press, 2010).

Most of the Caribbean islands lie on the Enriquillo-Plantain Garden Fault. "That's how you got all the islands in the first place," said Dale Grant, a geophysicist at the National Earthquake Information Center near Denver (Samuels, 2010). With rainy seasons taking place twice a year - one in April-June and the other in August-September - it became apparent that more stable housing would be needed considering the threat of flash floods (WHO, 2010).

As many of the NGOs and NPOs are leaving there are fewer and fewer organizations left to help with rebuilding. Unfortunately, Haiti is at risk for future earthquakes. Historically in this region, earthquakes tend to repeat in series. Haiti had a series of at least four major earthquakes between 1751 and 1770, which completely destroyed Port-au-Prince (Thomson, 2000).

Conclusion

So, what can be done now that Haiti is rebuilding its housing, transportation, water infrastructure, land use, and health care? For Haiti to have a better future, sustainable solutions must be found. First the government needs to work to support its people in creating an economy that is self-sufficient. Next, international groups and the government itself need to improve policy and have donor attention be consistent in creating long term solutions (WHO, 2010). Finally NGOs, NPOs and the government need to work to educate the people so that can design, plan, build and implement a better future. If the common Haitian is able to be a doctor, nurse, construction worker, etc. the future will be brighter. Not only will they have pride in their country, but the middle class will expand as the quality of life will improve.

A long term solutions is the key to broad improvements in environmental and health issues in Haiti. With those solutions, infrastructure should be improved to provide basic health needs for the population. Family planning and safe sex practices should be encouraged and funded. Haiti's women – especially the poor and illiterate – must be

empowered by educating them about their options. Family planning is one of the most important measures that can be implemented to reduce unwanted pregnancies (especially of HIV women), poverty, maternal and infant mortality, depletion of natural resources, and malnutrition. Haiti's women need to have more options and a chance to become productive members of society – rather than spending their lives unsuccessfully providing for too many children.

Haitian leaders should look at the system Dr. Paul Farmer has used to run his facility - training Haitians to be medical professionals and making them self-sufficient. Medical professionals must go out in the community and immunize the population against preventable diseases. Haiti's healthcare workers should continue to monitor the administration of TB medicines using the DOT system to reduce the spread of MDR Tuberculosis. It is alarming that MDR TB could not only spread in Haiti, but to other surrounding regions, including the U.S.

Clean water should be made available for all citizens of Haiti to reduce the spread of gastrointestinal diseases. The construction of a new clean-water infrastructure from the cities to rural areas is needed. Hiring locally for this project would create jobs for Haitians and would also train them to maintain the new system.

All of these solutions could, in turn, create a healthier and more productive society. The question remains how and who will pay for all of these strategies needed to improve lives for Haitians? These are not easy questions to answer but there are options for funding these projects (Associated Press, 2010). For example, there are many natural resources in Haiti and goods that can be exported. Its major exports are bauxite, cocoa, coffee, essential oils, light industrial manufacturing, mangos, sisal, and sugar (Central Intelligence Agency, 2010). Education loans could be provided to Haitian citizens so that they could learn to start small businesses that utilize or export these natural resources. This practice would improve the economy and increase the standard of living.

The 2010 earthquake was a tragedy that resulted in destruction, death, injuries, and suffering in a country where there already has been disproportionate hardship. Rebuilding Haiti could be an opportunity and a time for Haiti to move forward.

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