Prevention of Cholera in Haiti: Community Education

Zarah Collins, Kathryn Gaxiola, Nolan Hoyer, Justin Huey, Katie Lee, Alyssa Medina

Department of Nursing, CSU Stanislaus

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Professor Melanie Rines RN, MSN

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Executive Summary

The 2010 earthquake in Haiti killed about 200,000 people (Engle, 2018). However, the earthquake was just the beginning of the plight for the Haitians, who suffered from homelessness, the collapse of governmental structures, and a lack of clean drinking water (Engle, 2018). This situation was an ideal environment for a rampant outbreak of Cholera that became reality and claimed another near 10,000 victims (Griffiths et al., 2021). UNICEF warns that this disease continues to threaten the residents of Haiti, and proclaims that over half a million children are in danger of being exposed to another outbreak (UNICEF, 2021).

Many reasons exist for the spread of Cholera in Haiti. Chief among them is the limited access to clean drinking water since the organism spreads through the fecal-oral route and through contaminated water. Some programs suggest budgets to address this problem that require nearly $100 million, but our proposal will require approximately one-quarter of the cost (UNICEF, 2021).

The proposal consists of a $23 million budget, gathering funds from various national and global organizations to mobilize the National Plan for the Elimination of Cholera in Haiti. Health agents (HAs) and volunteers will be trained and educated about cholera prevention techniques, while volunteers will be trained and recruited to provide vaccines. Various forms of media will be implemented to further reinforce concepts, exposure, and internalization. A home visitation campaign will be conducted where water purification materials will be distributed. Local leaders will collaborate with efforts at ongoing education and data collection for further adaptive strategies.

By one year, we expect 99% of the target population to be educated on prevention. Namely, they will be educated concerning hand hygiene, food handling, waste disposal, use of

purification tablets, and use of solar disinfection techniques. Furthermore, by one year, 95% of the population's cholera vaccine status will be determined and 75% of that population will have been given vaccine education and will also have updated cholera vaccination. It is our goal that no new cholera cases will be reported in Haiti and that in the long-term, the education, vaccination, and materials used will prevent future cholera outbreaks.

Problem Statement

Background

The earthquake that devastated Haiti in January of 2010 had lasting effects and revealed the vulnerabilities caused by Haiti's poor infrastructure, poor sanitation, and lack of access to clean drinking water. This natural disaster was followed by an outbreak of cholera in October of 2010 in Centre Department and Artibonite that later spread all throughout Haiti (Ministry of Public Health and Population [MPHP], 2013). Cholera, caused by the bacteria *Vibrio cholerae*, cycles primarily between brackish waters and the human gut with transmission occurring by the fecal-oral route via contaminated food and water (Hsueh & Waters, 2019). The debilitating watery diarrhea, vomiting, and dehydration caused by cholera are usually easily managed with oral rehydration therapy, but can lead to death if not treated quickly or if left untreated. This was the case with the outbreak in Haiti that has affected over 820,000 people and killed nearly 10,000 since its start in 2010 (Pan American Health Organization [PAHO], 2020).

Cholera spreads and wreaks havoc quickly in developing countries such as Haiti where there are inferior sanitation systems and people lack adequate access to clean drinking water and treatment for illness. Prior to the earthquake, Haiti was already vulnerable with only 63% of the population able to access improved water sources, and only 17% with access to improved sanitation (MPHP, 2013). This, along with poor hygiene practices among most populations,

facilitated the transmission of cholera. As much as 46% of the Haitian population lacked access to health care, so lack of treatment led to high mortality rates (MPHP, 2013).

Though local and global concerted efforts have led to at least one year free of confirmed cases of cholera in Haiti as of January 2020, efforts to monitor and prevent cholera must persist because cholera is still considered endemic by the World Health Organization (WHO) until cases remain absent for a total of three years (PAHO, 2020). Haiti still remains vulnerable should another natural disaster occur. As stated by the PAHO Director, Carissa F. Etienne, "Cholera is a disease of inequity that unduly sickens and kills the poorest and most vulnerable people – those without access to clean water and sanitation" (PAHO, 2020).

Literature Review

Community health workers (CHWs) played a key role in educating and supporting efforts to manage the cholera epidemic and prevent further spread in Haiti (Rajasingham et al., 2011). CHWs were trained to educate others about the transmission, prevention, control, and treatment of cholera using comprehensive materials developed by the Centers for Disease Control and Prevention (CDC). This proved challenging to translate into the local language because of its limited written use and many dialects (Rajasingham et al., 2011). Cultural challenges such as these are important to address and highlight the importance of using culturally competent methods and involving the community when educating the target population in order to create effective, long-term solutions (Engel, 2018).

While improvement of drinkable water, sanitation, and hygiene (WASH) have been long-term goals, oral cholera vaccines (OCV) have been used as an additional tool in the prevention and control of cholera (Wierzba, 2019). OCV campaigns, first introduced in 2012 by the Haitian Ministry of Health and Population, had varying effects on the hygienic practices and

knowledge of cholera within neighboring communities. Aibana et al. (2013) surveyed households in St. Marc on their knowledge of cholera and their rate of utilizing hygiene practices before and 3 months after the OCV campaign. A greater number of respondents could identify various cholera transmission routes, water treatment methods, and cholera prevention measures after the OCV campaign. Water treatment rates also increased from 49.4% to 62% after the OCV campaign (Aibana et al., 2013). However, Childs et al. (2016) saw different results when they surveyed households in Petite Anse and Cerca Carvajal before and one year after the OCV campaign. Although the knowledge of cholera and its transmission was unchanged after the OCV campaign, they found that the rates of water treatment decreased from 65.7% to 27.2%. The authors discussed that the observed decrease in hygiene practices could be attributed to a false sense of security from the vaccines given that 34% of respondents felt that the vaccine was enough to protect them (Childs et al., 2016). Additionally, the contrast in the results between these studies could be due to the difference in the amount of education provided at each clinic. Only 49.2% of people reported receiving information about cholera prevention in the Childs et al. (2016) study, which suggests the need to pair comprehensive education with future OCV campaigns.

Though many organizations have made concerted efforts both locally and globally to improve the situation in Haiti, resources in developing countries are often limited and can hinder these efforts. Thus, it is important to be able to identify underserved areas and hotspots for surveillance as well as for prioritizing resources, especially during outbreaks. Griffiths et al. (2021) were able to identify areas close to rivers and unimproved water sources and urban areas with markets as priority locations within Centre Department, Haiti according to determinants of cholera at the local level, and they suggest that their methods could be used in other contexts.

Logic Model Summary

The logic model is an easy-to-follow guide that explains how the goals will be met, when the goals will be met, and who will benefit when the goals are met. The estimated project proposal budget of $23 million is based on the accumulated monetary funds from various national and global organizations to mobilize the National Plan for the Elimination of Cholera in Haiti, a 9-year long project to eliminate cholera by 2022 (MPHP, 2013). must state see appendix

Once the program is approved, the team will implement the objectives that are focused on education, prevention measures, and access to resources. Activities include training to educate HAs and volunteers about cholera prevention techniques, and recruitment and training of volunteers who will provide OCV. Apart from educational campaigns utilizing social media, tv, radio, and flyers, the team will also host vaccination clinics and conduct home visits to educate and distribute water purification materials such as chlorine tablets and PET bottles. Lastly, the team will identify and work with community leaders to facilitate ongoing education as well as collect data on the vaccination status of the target population from local health departments. To achieve the overall program goal of preventing new cases of cholera in the next 12 months, the team will need to follow the short-term, mid-term, and long-term goals.

By one year, at least 99% of the target population will be educated on proper hand hygiene, safe food handling, proper human waste disposal, the use of water purification tablets for drinking water, and will know how to use solar water disinfection techniques. This will be achieved by aiming for more conservative goals of 35% and 70% of the target population at the 3 month and 6-month marks, respectively. Furthermore, by one year, 75% of the target population will have current vaccination statuses and will be educated on the effectiveness of OCV. This will be achieved by aiming for more conservative goals of determining the vaccination status of

95% of the target population by 3 months, and by 6 months, 60% of the target population will be vaccinated with the initial vaccine or the booster.

Program Goal

The last confirmed case of cholera in Haiti was in January 2019. Through massive national and global public efforts, the outbreak appears to have been successfully squashed thus far. However, in order to end cholera in Haiti and receive validation from the WHO for eliminating the disease, the country must maintain effective surveillance systems and remain cholera-free for a total of three years (PAHO, 2020). Therefore, the country has four more months to officially reach that finish line. However, because of its poor infrastructure, economic and political instability, and vulnerability to natural disasters, continuity of currently observed practices and of sanitation improvements will remain vital to keep the epidemic under control beyond this 4-month timeframe. For this reason, the research team made it its goal to prevent any new cases of cholera in the next 12 months following program approval and implementation. The program is guided by objectives that are focused on education, prevention measures, and access to resources.

Objectives

Objective 1

By 1 year, at least 99% of the target population will be educated on proper hand hygiene, safe food handling, and proper human waste disposal. In order to educate a variety of Haitian communities, campaigning measures should target both rural and suburban communities. Each community will need to have its own distinctive campaign messages for those that are illiterate and those that are tech-savvy. As stated earlier, surveys from different regions had different results after vaccine campaigns ended. Safe handwashing practices, water treatment practices,

and proper disposal of human waste are essential prevention measures that should be understood by each and every Haitian family member no matter their background. Easy to read or even picture-friendly educational pamphlets will be distributed to each household in rural communities. The team will submit a petition for TV networks to support the campaign as well as campaign managers will create several social media pages for Cholera prevention techniques that are accessible to all residents.

The pamphlet and social media accounts will include directions on how to wash hands appropriately, handle food safely and dispose of human waste accordingly. According to the CDC website, the article "When and How to Wash Your Hands" contains 5 steps to washing your hands correctly to prevent the spread of germs:

> Wet your hands with clean, running water (warm or cold), turn off the tap, and apply soap, lather your hands by rubbing them together with the soap, lather the backs of your hands, between your fingers, and under your nails, scrub your hands for at least 20 seconds, rinse your hands well under clean, running water, dry your hands using a clean towel or air dry them (Centers for Disease Control and Prevention [CDC], 2021).

Furthermore, the pamphlets and web pages will include a list of when it is necessary to wash your hands, such as before, during and after handling food, before and after eating, before and after caring for someone that is sick, especially if someone is vomiting and diarrhea, before and after treating scrapes and open sores, after defecating and urinating, after changing diapers or cleaning after a loved one, after touching animals, their food and their waste, and after touching garbage (CDC, 2021).

Handwashing is an important factor in preventing diseases as well as safe food handling measures. The communities will be taught how food can become contaminated when not using

safe measures. Individuals will be able to hold larger distributors accountable by asking about their safe practices when handling food including rice, beans, fruits, vegetables, and meats. Once the food is brought home, anyone handling the food will need to keep a clean and sanitary section set up prior to preparing the food for their family. In communities where people have refrigerators, the education will focus on following the recommendations from the WHO. According to the WHO, "There are five keys to safer food, which were developed to educate safe food handling behaviors to all consumers and food handlers" (World Health Organization [WHO], 2020). The five steps include keeping a clean working station, separating raw and cooked meats, cooking meat thoroughly, keeping food at safe temperatures, and using clean water on raw materials (WHO, 2020). Those in rural communities that do not have access to electricity will receive information emphasizing water treatment and washing food with safe, drinkable water.

One of the main causes of the cholera outbreak was due to fecal matter running into the river flowing downstream to other communities. The campaign will focus on educating communities about disposing of urine and fecal matter appropriately. Latrines and EkoLakay are two resources available to Haitian citizens in urban and rural areas. Latrines are also referred to as pit toilets. According to Orner et al. (2019), "They consist of a hole in the ground, which may be unlined or lined, with a reinforcing material to contain human excreta. Depending on its design and frequency of use, pit toilets can be used for 10 to 30 years, though many are used for fewer than 5 years before they are full and must be emptied or covered." The managers would educate and emphasize the difference between Latrines and man-made holes, some residents believed they made a latrine; however, it was a hole the residents dug in the ground that was not maintained and ended up contaminating the soil (Orner et al., 2019). EkoLakay toilets are

wooden with the ability to cover the top in case of floods or during transportation. EkoLakay services include disposing of the waste and recycling it into compost. In research from Adcock (2020), the author reports EkoLakay toilets as more affordable than Latrines and it uses compost material to combat bacteria after each use. The campaign managers will educate and teach the communities how to set up and maintain Latrines and EkoLakay toilets to help keep the epidemic under control beyond the 4-month timeframe.

Objective 2

By 1 year, at least 75% of the households surveyed will have OCV that is less than 5 years old and will be educated on the effectiveness and limitations of OCV. Multiple studies have proven that killing OCV, in conjunction with WaSH, is a safe and effective tool for cholera prevention and control. Since 2013, there were mainly 2 types of two-dose OCV that have been distributed and covered what was estimated to be 75% of the national population (Sévère et al., 2016). The standard two-dose course is 76% effective against clinical disease. However, protection from the vaccine wanes over time, and OCV is far less effective in young children than in adults (Lee et al., 2020). The documented duration of significant protection induced by these current OCV is 2 years. Hence, WHO recommended initial vaccination be followed by a booster every second year (WHO, 2010). To support the drive to widen the coverage of vaccinated Haitians, the team therefore would first work with local Haitian governments to come up with current statistics of how many people are still not vaccinated and how many need and will need booster injections. This will determine the number of OCV that will be needed during the 12-year run of the program. The OCV will then be delivered through vaccination booths and home visits, concentrating on rural areas where access to running water or clean water is still a challenge, and health resources are scarce.

In addressing the problem identified by Child et al. (2016) on the misconception of some vaccinated people with regards to the protection offered by OCV, the team, through the collaborative efforts of recruited HAs and local leaders, will initiate campaigns that will mainly inform the target population of the limitations of the cholera vaccine- that is not 100% effective and does not protect from other foodborne or waterborne diseases (Centers for Disease Control and Prevention [CDC], 2018b) hence, the continual need for proper hand hygiene, proper waste disposal, and water sanitation. This will be included in the education that will be provided in the home visits and will also be part of the vaccination campaign.

Objective 3

By 1 year, 99% of the households surveyed will have access to drinkable water resources and improved water purification techniques such as chlorination and use of solar water disinfection (SODIS). Geologic, ecologic, sociologic, and economic factors account for the challenges in providing safe and sustainable water in Haiti, and today, more than half of the country's rural population still lacks access to drinkable water (World Bank Group, 2020). Access to clean water realistically cannot only depend on water system infrastructures and further measures that require individual households to disinfect their drinking water is a must. The team considered the different water treatment methods used in Haiti and other countries and using evidence-based research, concluded that the two methods that are most cost-effective and most sustainable for households are 1) chlorination and 2) SODIS (Garcia-Gil, 2021). Chlorination has long been aggressively used in Haiti for water disinfectants since the outbreak in 2012 and has proven to be safe and effective. At present, a community purchases its own chlorine supply from a locally-operated chlorine distribution center and sells them to individual households (Haiti Water, 2018). In addition to ensuring correct chlorine dosing, the team deems

it prudent to educate residents on an alternative method that can be used in addition to, and in place of chlorination in the face of shortages, or another epidemic that may interrupt the supply. Hence, the introduction of SODIS. To avoid potentially overwhelming household members with too much information in a single home visit, the team will conduct separate visits that will exclusively be for checking water chlorination and teaching SODIS methods and providing the necessary materials to facilitate these methods.

Technical Approach

Target Population

Haiti's territories are administratively divided into *departments*, which are further divided into smaller sections (Childs et.al., 2016). The target population for the 12-month term project was decided by considering which department had been most affected by the epidemic and that would feasibly allow for the widest coverage of service as possible given the set timeframe and gathered resources. Field investigations conducted after the outbreak in 2010 identified 9 most affected communes throughout the country and among these areas, 5 are under the Artibonite department (Griffiths et al., 2021). Hence, the team opted to concentrate on implementing the project in these 5 communities, which consist of both urban and rural areas: Gonaives, Ennery, St. Marc, Petite-Riviere-de-l'Artibonite, and St. Michel-de-l'Attalaye. The current population in each was considered, the total of which is where the size and distribution of manpower and resources are based on.

Expenses

In terms of the project's financial aspect, a 1-year budget has been created to account for all expenses. Direct personnel expenses and direct operating expenses are included in this

budget, both totaling $21,179,075.10 (see Table 1). The number of people that will be accounted for in the budget is the Artibonite population in Haiti of 588,472.

With an estimated budget of $23 million, $10,192,000 will be allocated to direct personnel expenses to hire full-time lead educators and HAs. There will be a total of 100 lead educators and 2,000 HAs: refer to Table 1 for expense details. For the remaining budget needed, $10,987,075.10 will be allocated to direct operating expenses to cover travel, food and housing, supplies: medical and non-medical, chlorine tablets, vaccines, clean PET 2-L bottles, training/conferences, and advertising. Travel expenses will include the cost of purchasing gas, vans, and flights. For non-local volunteers, food and housing will be provided. Medical supplies expenses will include purchases of hand soaps, hand sanitizers, and more; non-medical supplies expenses will include educational material in the form of flyers and brochures. Advertising expenses will include services using social media, radio hosting, and TV.

Training and Education

The project will be carried out in three phases- 3 months, 6 months, and 1 year. In the first phase, the team will focus on producing at least 100 trained personnel who will lead the education campaign on the following topics: hand hygiene, safe food handling, proper waste disposal, advantages and limitations of OCV, and water sanitation techniques. Training will be provided through comprehensive educational in-person seminars led by healthcare professionals from a pool of registered volunteers, preferably locals and who can speak Creole. Target participants in these seminars are community leaders, physicians, local nurses, and health workers from primary health care centers, teachers from primary and secondary schools, representatives from governmental and non-governmental health organizations, and representatives of local media. The initial group will then have their own teams, each consisting

of 15 to 20 members or HAs. A health agent may assume different and multiple roles, but each team is expected to have a leader, vaccinators, recorders, drivers, and all of whom can be educators provided they undergo formal training by the team leader.

Oral Cholera Vaccine (OCV)

The team aims to gather vaccination data on 95% of the residents in the target areas by coordinating with local health departments. Information will be accessed through their IT database and paper vaccination records or log sheets. A report will be generated on how many people are yet to be vaccinated, how many have vaccinations that are no longer current (3 years for children younger than 5 years old and over 5 years for the rest), the recipients'' names, address, age, and birth date. The result from this data collection will determine the number of vials that have to be ordered and stored in a given period. For booster vaccines, the team will use a single dose of Shancol™, which proved to be as effective compared to a two-dose regimen given 14 days apart (Chowdhury et al., 2020). This will save time and significantly reduce logistical requirements.

After the necessary data have been gathered, the team will begin the vaccination phase. The team will deploy the 100 sub-teams around the 5 target communities where there will be 2 to 3 vaccination posts set up every day of the week manned by at least 5 people to give vaccines, record, educate, respond to emergencies, drive, and provide food and other needs of the staff. The bulk of the vaccine campaign, however, will mobilize through a door-to-door strategy as this is the same platform that will be utilized to perform other education-focused interventions. Further, this method is expected to reach the maximum number of people in their homes and increase the probability of them receiving a primary dose if they have not been vaccinated, or a booster dose, depending on their age and the date they received the last dose. Fixed vaccination

posts have proven to have poor turnouts (Rouzier et al., 2013) but the team decided that they are still necessary for people who may not be at their homes most of the time and should still be in place to provide people with access to a stationary resource that can address any cholera-related questions and concerns.

Water Sanitation

A second at-home visit by HAs will take place to teach residents how to properly disinfect water using chlorine in tablet or liquid form. Each tablet should treat 1 liter of water. If using the liquid form of chlorine, the typical dose is 6 mL per 20 liters. The HAs are responsible for ensuring that the residents are using calibrated containers and will provide the tablet form in 20-tablet packages for free to last each family a year. The team decided to distribute the tablet form because of its longer storage life cycle of 5 years (Castelo, 2021).

For the SODIS campaign, the HAs will distribute clean 25-L PET bottles per family and instruct them to expose water in these containers to sunlight for 6 hours on sunny days, 48 hours on cloudy days, and not use it when there's continuous rainfall (García-Gil, 2021)**.**

Community Leader Involvement

In an effort to generate community support, the project will seek assistance from community leaders and groups in Haiti. Community leader, Reynald Jean, would be an excellent candidate as a lead educator for this project. He has had experience in the front lines during the start of COVID-19, where he "walked door-to-door through the crowded streets of a slum neighborhood in Port-au-Prince to bust false myths about coronavirus" (Moloney, 2020). Community leaders like Jean will engage with the community appropriately by speaking Haitian Creole and leading educational campaigns on the prevention of cholera topics as mentioned above.

In addition to community leaders, several political parties share the same mission to rebuild and create solidarity in Haiti. For example, Effort and Solidarity to Create an Alternative for the People (ESKAMP), led by Joseph Jasme, and Cooperative Action to Rebuild Haiti (KONBA), led by Jean William Jeanty, are two of the notable parties that have created community projects dedicated to education, culture, access, and disaster prevention (HaitiLibre, 2018). By working with these community groups and leaders, the community will be positively influenced and be provided the necessary resources to further prevent cholera in Haiti.

Barriers and Solutions

Construction of latrines will most likely be brought up by the community leaders as a high-priority need in the communities of Artibonite where sanitation and fecal waste management is still a problem (Williams et al., 2015). Ekolakay appears to be one of the most efficient waste management systems available and some NGOs that provide this like SOIL (Sustainable Organic Integrated Livelihoods) have already serviced urban areas like Cap-Haïtien and Port-au-Prince (Adcock, 2020). The team's funds will not cover providing for latrines or Ekolakay but they can start a petition for NGO's to expand their sanitation services to the communities of Artibonite.

The team also anticipates problems with literacy among the residents and therefore will not depend on written materials to promote this huge education-focused undertaking. Apart from employing the services of local volunteers, Creole-speaking HAs, and translators, radio and TV will be used to help spread the campaign and reach people with limited literacy.

Another point to consider is when introducing SODIS to communities. There is the possible skepticism among the residents concerning the leaching of harmful substances from the plastic into the water. This concern will be addressed by having team leaders explain to the

residents that concerns about chemical contaminants from plastic migration have been addressed by previous studies and SODIS has been accepted by the WHO which recommends it for use by low-income countries (WHO, 2011). Support from community leaders will be employed as well to promote this alternative water purification technique.

Monitoring and Evaluation

Monitoring and evaluating a program is essential to determine the effects of the program and identify any limitations in the program design. Due to the program's limited resources, other departments or communities in Haiti cannot be evaluated for comparison data. As a result, the team has opted for a goal-based evaluation model for the evaluation design. This model utilizes the outcomes presented in the logic model as the standards for evaluation (Centers for Disease Control and Prevention [CDC], 2012). The team will be coordinating with the Ministry of Public Health in Haiti to monitor for any new cases of cholera in the target population during the first year of the program. The team will also evaluate the program's effectiveness in achieving the project objectives after 3 months, 6 months, and 1 year of the start of implementation. The team will then compare the results with the planned outcomes within the logic model.

To evaluate the education campaign, HAs will conduct field visits to their designated households and survey their current knowledge of handwashing technique, food handling safety, water treatment, PET bottle use, proper waste disposal, and vaccine effectiveness. Individuals will either describe or demonstrate proper handwashing and water treatment to the HAs. Individuals will be considered adequately educated on these topics when they have less than 2 incorrect answers. During the surveys, HAs will also assess how frequently these families implement WASH protocols and utilize latrines, EkoLakays, and PET bottles.

Similar to the methods that will be used to gather vaccination data, the effectiveness of the vaccination campaign will be evaluated by analyzing electronic and paper vaccination records through the IT database. With this information, the team can determine what percentage of the population has a current vaccine status following the vaccination clinics.

In addition to assessing the target population's knowledge of water treatment, HAs will also conduct chlorine testing to ensure chlorine tablets are being used effectively. While inadequate treatment of water can lead to the transmission of cholera and other microbes, overtreatment of water can lead to toxic concentrations of chlorine and cause detrimental side effects (Centers for Disease Control and Prevention [CDC], 2018a). As a result, it is imperative to ensure the population's drinking water is within the optimal range of chlorine concentration. According to the Centers for Disease Control and Prevention (2020), chlorine concentrations should be between 0.5 to 4.0 ppm to effectively disinfect drinking water. HAs will be utilizing color wheel test kits to measure chlorine levels. The team will also provide chlorine test kits to each household so that families can monitor their water treatment on a daily basis.

Stakeholders are people or organizations that are interested, invested, or affected by the results of a program (CDC, 2012). After evaluating a program, it is vital to disseminate the findings to relevant stakeholders to justify funding and donations, display the effectiveness of the program, and allow input from the stakeholders on ways to improve. The team plans to consolidate the findings into a formal report and mail it to local legislators, Haiti's Ministry of Public Health, and organizations that funded the program. The evaluation report will also be posted on the program's website for the general public to see. In addition, the main findings will be shared through the local radio in Artibonite and displayed on posters throughout the

communities. This provides the target population the accessibility to remain informed and aware of the program's results.

The Haitian community would benefit immensely from this proposed program in order to prevent the recurring spread of cholera. Following program approval, "Prevention of Cholera" aims to achieve the goal of preventing any new cases of cholera in Haiti over the next 12 months by implementing objectives that are focused on community education, prevention measures, and access to resources. Three specific long-term objectives will be completed over the course of the program measuring awareness and adherence to preventive measures: (1) At least 99% of the target population will be educated on proper hygiene, safe food handling, and proper human waste disposal; (2) At least 75% of the target population's vaccine status will be current and they will be educated on the effectiveness of OCV; and (3) 99% of the target population will use water purification tablets for drinking water and will know how to use SODIS. Cultural competency will be followed when considering the Artibonite community as the target population and their primary language, Haitian Creole. Community education and screening will be completed by trained HAs who will hold educational campaigns, conduct at-home visits to distribute water purification tablets, and set up vaccination clinics. With consistent evaluation and monitoring using a goal-based evaluation model, HAs will help the program successfully progress toward its goal and determine if all objectives have been met.

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Appendix A

Cholera Prevention Program - Logic Model

Goal: To prevent any new cases of cholera in Haiti in the next 12 months following program approval and implementation with objectives that are focused on education, prevention measures, and access to resources.

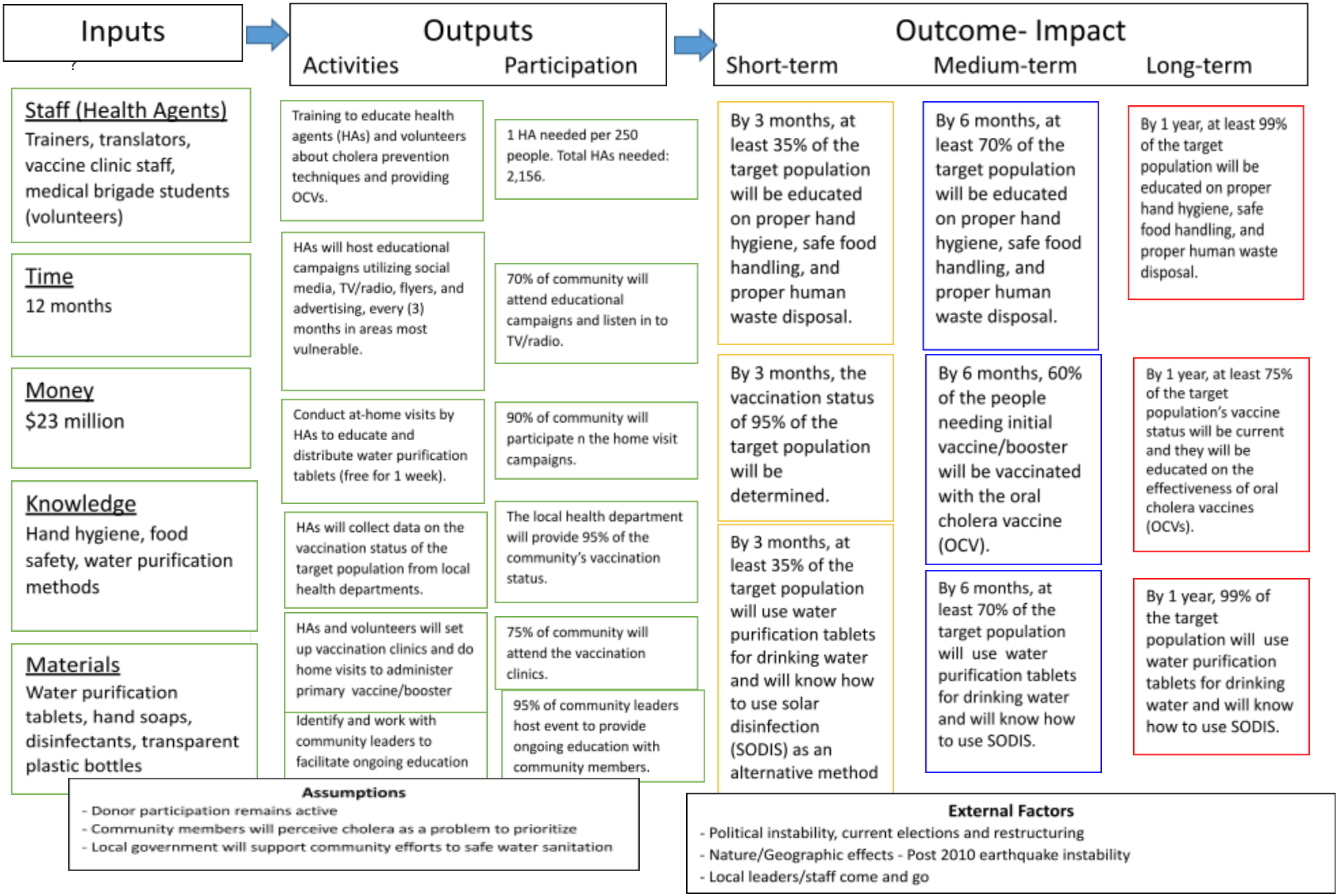

Table 1

Project budget table

Organization Name:	Cholera Fighters
Project Title:	"Prevention of Cholera in Haiti"
Total Persons Served:	588,472 (Artibonite)

PROJECT BUDGET	TOTAL PROJECT BUDGET
Direct Personnel Expenses (List title and % FTE on project)	
Lead Educators (100 @ 1 FTE)	1,456,000
Health Agents (2,000 @ 1 FTE)	8,736,000
Volunteer 500hr	0
TOTAL DIRECT PERSONNEL COSTS	$ 10,192,000
Direct Operating Expenses	
Travel (vans, flights, gas)	700,000
Food and Housing (Non-local Volunteers)	700,000
Supplies (medical: hand soaps, sanitizers, etc.)	1,298,000
Supplies (activities: educational material)	2,000,000
Chlorine Tablets	1,203,386.40
Vaccines	2,177,364
Clean PET 25-L bottles (1 per family)	257,456.5
Training/Conferences	1,500,000
Other: Advertising (social media, radio, TV)	50,000
TOTAL DIRECT OPERATING COSTS	$ 9,886,206.9
TOTAL EXPENSES	**$ 20,078,206.9**