Transforming Treatment in Thiotte:
Recommendations for Building Accountability and Sustainability at the Centre de Santé Sacré-Cœur de Thiotte

Prepared for Haiti Medical Mission of Wisconsin

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La Follette School Foreword

This report is the result of collaboration between the La Follette School of Public Affairs at the University of Wisconsin–Madison, and the Haiti Medical Mission of Wisconsin (HMMW) and its Executive Director, Carole Wakefield. The objective of our program is to provide graduate students at La Follette the opportunity to improve their policy analysis skills while providing the client an analysis of the funding, operation and sustainability of the Centre de Santé Sacré-Cœur de Thiotte (CSST), a Haitian-run clinic in Thiotte, a remote city in southeast Haiti.

The La Follette School offers a two-year graduate program leading to a Master’s degree in International Public Affairs (MIPA). Students study policy analysis and public management, and they can choose to pursue a concentration in a policy focus area. They spend the first year and a half of the program taking courses in which they develop the expertise needed to analyze public policies. The authors of this report are all in their final semester of their degree program and are enrolled in Public Affairs 860, Workshop in International Public Affairs. Although acquiring a set of policy analysis skills is important, there is no substitute for actually doing policy analysis as a means of experiential learning. Public Affairs 860 gives graduate students that opportunity.

This year workshop students in the MIPA program were divided into three teams. The other teams performed an assessment of the environmental and geopolitical risks of nuclear submarines and the development of a child deprivation index for the United States similar to those in other rich nations.

In an effort to identify key recommendations to achieve sustainability for the clinic, the team identified best practices in the areas of management, personnel, and administration for rural clinics like CSST. They found the challenges inherent in the remoteness of Thiotte compounded the considerable management, personnel, and administrative challenges that they already faced, and that significant changes needed to the management, hiring, training, and administration of CSST and its infrastructure for the clinic to become more accountable and hence more sustainable. Such changes could in turn create additional opportunities for funding from foreign aid organizations and other partners.

The team presents a menu of infrastructure, management, personnel, staff training, and administration recommendations, with low, medium, and high cost estimates, without prescribing priority. These recommendations involve both long-term projects and solutions that are more inexpensive and which could provide the clinic with short-term gains.

Timothy M Smeeding
Lee Rainwater Distinguished Professor of Public Affairs and Economics
May 2019
Madison, Wisconsin
Client Foreword

Haiti Medical Mission of Wisconsin, Inc. (HMMW) would like to thank the University of Wisconsin Robert M. La Follette School of Public Affairs for extending the Wisconsin Idea to our health care partnership with Centre de Santé Sacré-Cœur de Thiotte (CSST). As a Wisconsin based non profit organization, HMMW has benefitted from the service of over 300 Wisconsin residents and other dedicated volunteers. Supporters of the HMMW mission to provide Wisconsin expertise to establish and grow health care services for people living in a remote, rural area of the poorest country in the western hemisphere, is a reflection of the service minded intentions manifest by the Wisconsin Idea.

HMMW values the focused attention of a fine cohort of creative and capable students, under the direction of the Lee Rainwater Distinguished Professor of Public Affairs and Economics, Timothy M. Smeeding. HMMW recognizes the unique challenges presented at the outset of this spring semester project, requiring adjustment of research goals and methods. Specifically, unforeseen and heightened security threats in Haiti resulted in the need to forgo anticipated field work to address originally defined research questions. Furthermore, the sudden vacancy of CSST health care facility leadership and operations positions, due to extended absence and resignation of key Haitian staff, compounded challenges in collecting and analyzing relevant data.

Despite these challenges, the La Follette students adeptly adjusted and helped HMMW to focus the research to achieve meaningful recommendations. HMMW values the “can do” approach of the La Follette students to effectively utilize sparse CSST documentation and apply research and practices from comparable settings to offer recommendations in a pragmatic format and implementation time frame. Findings and recommendations will inform HMMW and CSST deliberations and decision-making as our partnership makes progress toward more independent and greater Haitian-based capacity for care.

Collaborating with our La Follette team has been a pleasure. It is with gratitude to the University of Wisconsin Robert M. La Follette School of Public Affairs that HMMW looks forward to employing recommendations contained within this report. The report will stimulate HMMW to better utilize volunteer and donor resources to focus and enhance our partnership with CSST to improve health care for people in the remote and rural area of Thiotte, Haiti.

Carole Wakefield Gergens Polynice, MS ’11, PhD ’13
Executive Director President

Board of Directors: Gergens Polynice, PhD, President; Jane Salinger, Vice President; Dr. Barry Cash, Secretary–Treasurer; Dr. Tony DeGiovanni; Terry Haag, RN; Dr. Garry Jean-Louis; Dr. Maureen Murphy; Kathy Roberg, RN; Dr. Bob Zemple
Acknowledgements

The authors would like to thank Carole Wakefield, the Executive Director of Haiti Medical Mission of Wisconsin, for providing us the opportunity to engage in this important work. Kathy Roberg and Sony Stinfil also deserve recognition for their invaluable contributions to our understanding of this project.

The authors would also like to thank Professor Timothy Smeeding for his guidance and support throughout the semester. We would like to especially acknowledge his generous support, in conjunction with the La Follette School of Public Affairs, in funding the community interviews our client pursued when we were unable to travel to Haiti. Thanks to this funding, this report will be able to be translated into French, for which we thank Sandra Descourtis for her work. In addition, Lisa Hildebrand provided critical feedback on our paper, and we are grateful for her guidance.
Executive Summary

Haiti Medical Mission of Wisconsin (HMMW), a 501(c)(3) organization, works to provide quality healthcare access to the people of Thiotte, Haiti and surrounding communities. The nonprofit began its work in 1997 through mission trips of medical professionals from Wisconsin to Thiotte, a remote city in southeast Haiti. Within five years of beginning this work, HMMW opened Centre de Santé Sacré-Coeur de Thiotte (CSST), a Haitian-run clinic bringing year-round healthcare access to the residents of Thiotte and the surrounding region.

The relationship between HMMW and CSST has existed since the clinic’s inception. However, that relationship has never been formalized. This fact has hampered HMMW’s ability to create systems to improve the quality of patient care, staff training, and accountability in reporting and budgets, which has made obtaining further funding difficult. At the request of HMMW, we analyzed relevant documents from CSST, HMMW, and the Haitian and American governments to identify challenges the clinic faces as HMMW works with CSST to prioritize Haitian-based and sustainable care. Through analyzing current literature, we identified best practices in the areas of management, personnel, and administration. We found the challenges inherent in the remoteness of Thiotte compounded the management, personnel, and administration challenges.

Our analysis concludes that significant changes need to be made to the management, hiring, training, and administration of CSST in order for the clinic to be made more accountable and sustainable, thus creating more opportunities for funding.

We conclude by presenting a menu of infrastructure, management, personnel, staff training, and administration recommendations. As HMMW has expressed interest in both involved long term projects and more inexpensive solutions that will provide the clinic with short term gains, we present an array of options for HMMW to consider without prescribing priority. We arrange each recommendation in accordance with its time frames and estimated cost while also inferring its ease of implementation so that HMMW can make an informed decision.

The short term actions we recommend include low and medium cost estimates. In terms of infrastructure, we recommend installing bucket-based water filters, pico solar electricity systems, and implementing a “push” supply chain system. Human resources recommendations include establishing effective leadership, creating job position descriptions, assigning clear roles, implementing staff celebrations, and starting a video module staff training program. The short term recommendation concerning administrative solutions involves implementing activity-based costing, hiring a facility manager, and developing an MOU.

Recommended medium term actions include low, medium, and high cost estimates. Installing a solar panel electricity system and implementing a “pull” supply chain system would address infrastructure challenges. In terms of administrative capacity, we recommend improving organizational culture, utilizing mobile applications, and requiring traditional accounting methods. Staff training recommendations for this timeframe involve applying for further funding, possibly from USAID, to facilitate future training partnerships.

Long term recommended actions tend to be more expensive. Infrastructure recommendations include installing a water filtration and pump system as well as partnering with other non-governmental organizations to bring a micro electricity grid to Thiotte. The construction of the lower building is also recommended, with the understanding that this carries a significant expense. In terms of personnel, we recommend instituting hardship allowances and
partnering with other hospitals, such as University Hospital of Mirebalais and their established Beyond Expert Program or other Haitian medical centers to further train medical staff.

Our paper concludes with a menu of these recommendations to best advise choices made by HMMW on next steps.
Introduction

Haiti Medical Mission of Wisconsin (HMMW), a 501(c)(3) organization, exists to provide quality healthcare access to the people of southeast Haiti, specifically within and surrounding the Belle Anse Arrondissement of the Department Sud-Est. After two Wisconsin churches were paired with the parish of Thiotte through Parish Twinning Program of the Americas, HMMW was founded in 1997 to improve health outcomes in the city. HMMW began this work through medical mission trips. And to date, through the service of 300 volunteers, HMMW has successfully completed 75 trips. Each medical mission trip of approximately five clinic days each, provides medical care to, on average, hundreds of Haitian patients (Wakefield 2019a). However, HMMW’s mission reaches beyond these medical mission trips. The organization centers the importance of “Haitian-based care” (HMMW n.d.) in its mission statement, and in 2002, opened Centre de Santé Sacré-Coeur de Thiotte (CSST), a clinic run by Haitian staff and funded in part by HMMW. CSST was established to be “a rural healthcare clinic, hospital, medical education, and public health training facility” (HMMW 2017, 1). It has greatly increased access to quality healthcare for the 23,000 residents of Thiotte and the over 160,000 Haitian residents of the Belle-Anse Arrondissement in southeast Haiti. Now over two decades into its relationship with the Parish of Thiotte, HMMW-sponsored medical mission trips continue, providing care prioritized by CSST to supplement year-round Haitian provided care. Volunteer medical mission teams provide services such as general and eye surgery, vision screening and lens distribution, dental healthcare, pediatric care, and urgent care, as well as other specialties within the teams’ expertise and scope of practice.

CSST provides year-round healthcare services including preventative medicine, primary care, and maternal and child healthcare. In addition to providing services to around 7,500 patients annually, CSST brings much needed economic traffic to the town (HMMW 2017). This positive economic impact, emphasis on local Haitian involvement, and twenty-two-year commitment distinguishes HMMW from other non-governmental organizations in Haiti, many of which do not employ local Haitians and prioritize the outcomes desired by the non-governmental organizations (NGOs) over the specific needs of the community (Loewenstein 2019). HMMW seeks to continue collaborating with CSST as the clinic works towards more independence and greater self-sufficiency.

There are significant challenges HMMW and CSST must overcome to achieve greater self-sustainability. The remoteness and inaccessibility of CSST create significant obstacles for the clinic as staff are unable to effectively obtain, utilize, maintain, and develop sufficient resources, both material and human, to provide quality healthcare for residents of the region. These challenges are compounded by struggles regarding the accountability of the clinic to HMMW and other existing and potential partners. Due to CSST’s remoteness, supporting, evaluating, and monitoring operations have proven difficult, and as a result, the current level of accountability is insufficient (Roberg 2019a). The intersection of the challenges inherent in remoteness, inaccessibility, lack of resources, and insufficient accountability have further restricted the ability of HMMW to obtain adequate and reliable funding. These challenges must be overcome before HMMW and CSST can continue to build towards their mutual goal of CSST becoming a more self-sustaining clinic that provides predominantly Haitian-based care.
The goals of this paper are as follows: to define and codify the challenges of remoteness and inaccessibility in the context of Haiti in general and Thiotte in specific; to examine best practices in regards to infrastructure, management and personnel, administration, and accountability between NGOs and healthcare facilities in least developed countries; and, based on an evaluation of these best practices, to make recommendations for HMMW going forward in short, medium, and long term timeframes. It is our intention that HMMW will be able to use the guidance of this document to leverage funding from donors and grant-giving organizations.

Methodology

We began our research by reviewing documents provided to us by HMMW and CSST regarding mission, grant applications, budgets, and personnel reports to assess the challenges facing these organizations and their partnership. In addition to these documents, we were given access to interviews conducted with community members in Thiotte. As a team, we interviewed HMMW staff and a board member for further explanation of the current situation at CSST. In collaboration with HMMW, we defined the scope of the project and where best to focus our efforts. After this assessment, we analyzed relevant literature which enabled us to establish best practices for addressing the challenges determined by our assessment. Based on those best practices, we conclude this paper with a menu of recommendations to HMMW regarding its relationship with CSST.

Limitations and Assumptions

It is important to acknowledge the limitations of this project. First, due to extreme political unrest, the research team was unable to visit Thiotte as originally planned, severely limiting the amount of quantitative and qualitative information specific to CSST available to us. As of April 9, 2019, Haiti was still ranked as Level 4: Do Not Travel on the U.S. State Department travel list (US Department of State 2019). With parliamentary elections scheduled for October 2019, it is expected that the warning will stay in effect - further complicating HMMW’s ability to travel to the clinic (Wakefield 2019c).

Despite this situation, we did have access to some of CSST’s financial documents; however, the same calculations were inconsistent in reporting across years and quarters, and at times, it was unclear if the amount reported was in U.S. dollars, Haitian gourdes, or both. Additionally, findings from a January 2019 visit conducted by local priests were made available to us, but those findings were inconsistent with what HMMW believed was happening at the clinic. This indicates that there is potential miscommunication occurring between organizations.

In the short term, HMMW indicated a desire to be cost-minimizing while also investing more significantly in CSST in the longer term (Wakefield and Roberg 2019b). However, the implementation of all the proposed recommendations will be dependent on sufficient CSST leadership and oversight, the future funding landscape of the HMMW-CSST partnership, and staffing levels and expertise.
Within the analysis and subsequent recommendations, the following general assumptions were made: large nation/region wide infrastructural issues will remain the current status quo, the Haitian political situation will not worsen, and continuing the clinic’s operations is of utmost importance. When pricing recommendations, we made the deliberate decision to only include the cost of the item. We did not include the cost of staff time to implement these recommendations or the opportunity costs associated with the staff time that would be devoted to implementing these recommendations at the clinic. It is important to note that besides employee buy-in, we did not consider any of the non-monetary costs associated with some of the recommendations.

The proposed recommendations are intended to provide workaround solutions given the challenges at hand. While each of the issues are deserving of individual attention, overcoming these obstacles will inevitably involve overlap between areas. Many of the challenges are interdependent and the constantly changing political landscape means that our analysis of the challenges inherent in working within Haiti should be critiqued depending on the current status of the Haitian government and its relationship with its citizenry and the international community.

**Status Quo**

The factors that contribute to CSST’s remoteness and inaccessibility stem from challenges inherent in working in Haiti and are compounded by the more specific context of Thiotte’s location in the southeast of the country. See Appendix A for a map.

Without a strong government to provide services, NGOs and the Catholic Church have largely filled the void. For example, in the parish of Thiotte, the parish priest oversees CSST, many churches/chapels, and multiple schools. Due to the inefficacy and instability of the government structure, it is helpful that CSST functions within the religious infrastructure of Haiti, especially because the Bishop of Jacmel has experience as a general director for the Catholic Health Association St. Francis de Sales Hospital in Port-au-Prince.

Transportation infrastructure in Haiti is inconsistent and ineffective, especially outside of Port-au-Prince, rendering travel across the country difficult at best and impassable at worst. Travel between Port-au-Prince and Thiotte is challenging due to road conditions. It is also difficult for residents of the surrounding area to travel to Thiotte as many travel by motorbike, tap-taps, or foot (Roberg 2019b). Due to these transportation challenges, it is difficult to bring in materials such as those needed for any construction and renovation (HMMW 2017).

The lack of electricity and water infrastructure in Haiti compounds the remoteness of rural areas. This is because “in place of a national power utility, Electricité d’Haïti, operates one primary grid serving the Port-au-Prince metropolitan area and a small number of isolated power grids for the rest of the country” (USAID 2018). Thiotte does not have a working electrical grid, which means the city, including CSST, relies entirely on diesel generators. Such unreliable electricity makes phone and internet connectivity a challenge. Additionally, Haitians have limited access to clean water (The World Bank 2015). Thiotte residents access their water from a nearby river as “no continuously reliable potable water sources exist in the area” (HMMW 2017, 7).

While not typically included in the definition of a region as remote, the current volatile political situation in Haiti contributes greatly to the isolation of the country. In recent months, there have been violent protests stemming from rampant government corruption, a notable
example being a tainted fuel agreement with Venezuela recently exposed by the Haitian Senate (Ives 2017). Due to this history of corruption, many NGOs operate within Haiti without partnering with the government, essentially bypassing official power structures and, in doing so, undercutting the authority of the government in the eyes of the people (Collier 2010). The high number of NGOs in Haiti have earned it the moniker “The Republic of NGOs” and has created an imbalance of power by marginalizing the state from the “core task of service provision,” resulting in citizen disillusionment (Collier 2010). In 2018, the Fund for Peace gave Haiti a score of 102 on its “Fragile States Index,” placing it on the “high alert” list (Fund for Peace 2018, 7). This score was largely due to concern regarding Haiti’s lack of “public services” and destabilizing “external intervention” (39).

The remoteness and inaccessibility of CSST compound the challenges inherent in running a healthcare facility in a least developed country.

**Infrastructural, Resource, and Facilities Challenges**

Thiotte is significantly lacking in resources and connectivity. The remoteness of Thiotte is a major contributor to the infrastructural issues currently plaguing Centre de Santé Sacré-Cœur de Thiotte. The clinic faces a significant shortage of electricity, lacks reliable internet and cell phone connection, and its potable water supply is limited (Dieuveille and Léveillé 2019; Roberg 2019a, 2019b). Furthermore, Thiotte is difficult to access due to the poor quality of its connecting roads, leading to an increase in the cost of procuring medical and building supplies and other necessary services (Wakefield and Roberg 2019b).

**Transportation**

To travel to Thiotte from Port-au-Prince, a trip of about 62 miles, HMMW volunteers recount traveling for four to five hours. Only the first 22 miles of the route from Port-au-Prince to Thiotte is paved; the remaining miles of road take the form of both a bumpy carved rock road and a dry riverbed. Travelers must pass dangerously eroded ledges, deep ruts, and, in the rainy season, sections of the route can become completely impassable (Roberg 2019a). Even in drier seasons, vehicles must ford a river multiple times, often over a length of “20 to 30 feet of water that is an unknown depth until we get into it” (Roberg 2019a). Despite the poor road conditions, there are public transportation vehicles that make the daily round-trip journey from Port-au-Prince to Thiotte (Roberg 2019a). While the department capital of Jacmel is technically closer to Thiotte, the mountainous road between the two cities is in even worse condition. A recent trip by a team from the Jacmel diocese to Thiotte took over seven hours (Dieuveille and Léveillé 2019).

An international think tank, the Copenhagen Consensus Center, recently published reports detailing the economic impact of the inadequate road system in Haiti, reporting, “the inadequacy of the road network, combined with the pitiful state of roads and transport vehicles, means a large part of the rural population is isolated” (Lomborg 2017). Likewise, the poor quality of roads to Thiotte, and resulting isolation, is a major cause of most of CSST’s issues of infrastructure, connectivity, medical facilities, and resource shortages.
**Electricity**

Thiotte does not have a working electrical grid and thus relies exclusively on diesel generators for power. CSST obtains all of its electricity from a faulty generator, a system that is ungrounded and thus is a danger to both staff and the system itself (HMMW 2017). The CSST system also utilizes 16 generator-charged batteries that are five years old and in need of replacement (Dieuveille and Léveillé 2019). The irregularity of electricity production is compounded by the reality that all fuel must be imported on Thiotte’s rough access road, leading to energy shortages at the hospital and community at large (HMMW 2017). In its 2017 United States Agency for International Development (USAID) grant application, HMMW proposed replacing CSST’s generator with a “20-25KW three-phase generator that will be able to cover an expanded [electricity] load” in addition to other necessary safety equipment (HMMW 2017, 13).

The impacts of the electricity shortage are multi-faceted. When the generator is off there is little to no electricity available because the energy storage batteries are in poor condition (Dieuveille and Léveillé 2019). Given that the generator cannot run continuously, the lights are often left off to conserve energy, rendering lighting insufficient at the clinic and likely decreasing patient satisfaction (Roberg 2019b). On an employee-level, CSST staff housing also lacks electricity and basic amenities (Dieuveille and Léveillé 2019). The power shortage inhibits CSST’s medical staff’s ability to effectively care for patients as use of medical equipment and computers, ability to store medicines requiring refrigeration, water pumping, and other necessary tasks are all hindered by a lack of consistent electricity (Wakefield 2019a).

**Connectivity: Internet and Telephone**

In addition to its physical remoteness, Thiotte and CSST have limited access to telecommunications. While Thiotte has its own cell tower, the connection is unreliable from both of the companies providing service, Digicel and Natcom. Most residents own cell phones for calls and messaging. However, even WhatsApp, a commonly used instant messaging app in Haiti and worldwide, is not always functional given the poor service (Roberg 2019b). The clinic has an internet router that is dependent on electricity from the unreliable generator and provides slow and sporadic internet access (Roberg 2019b). This dearth of internet access at CSST isolates staff from easily accessing auxiliary sources of knowledge such as consulting with internet medical sources or outside practitioners. Beyond the lack of internet access, there is currently no telemedicine infrastructure in place to enable CSST’s medical staff to connect with other practitioners (Roberg 2019a). There is a computer at CSST and the clinic accountant has expressed interest in using bookkeeping software. This would require software on a CD-ROM, as online options would not be possible, currently (Roberg 2019a).

**Water and Sanitation**

Access to clean water is a significant challenge in Haiti. According to The World Bank, “less than half of Haitians in rural areas have access to water” (The World Bank 2015). In Thiotte, there are not reliable potable water sources as the city’s water system is sourced from a nearby river (Wakefield and Roberg 2019b). CSST’s plumbing, water, and sanitation infrastructure all require upgrading and repair. The only water sources for CSST are two 500-gallon water tanks, a 16,000-gallon rainwater catchment system, and delivery by truck. The building does not have filtration, and thus none of the water pumped into the clinic is potable (HMMW 2017). CSST staff “report regularly running out of water” due to a lack of electricity to...
There are no functioning flush toilets on the premises but when the toilets are used, the waste is collected in a cement pit below the hospital. While the pit is not believed to be leaking, the status of its remaining capacity is not known (Wakefield and Roberg 2019b).

The impacts of current potable water shortages are significant. Most importantly, the ability to maintain basic standards of hygiene is lacking due to the absence of running water in the toilets and sinks. Instead, buckets are used for flushing and handwashing (HMMW 2017).

**Medicine and Other Resources**

It is difficult and costly to strategize bringing in larger materials such as those needed for construction. The further challenge of transporting the imported materials to Thiotte is also a concern as it “is in an isolated area with poor infrastructure” (Dix 2018).

Additionally, in spite of medicine’s critical role in many treatments, the clinic often faces shortages of necessary drugs (Dieuveille and Léveillé 2019). It appears that medications for CSST are primarily obtained by Dr. Judeson in Port-au-Prince during his frequent back and forth travels from Thiotte (Roberg 2019b). Currently, the clinic pharmacist manages the medicines and supply inventory, though the reliance on sourcing medicine from Port-au-Prince makes resupply of medicines challenging (Roberg 2019b). Other than CSST, there are other small medicine shops in town, though they generally sell expired Chinese-produced medicine (Roberg 2019b). Beyond the logistical challenges specific to CSST, the cost and consistent availability of medicines in Haiti also pose a problem for providers and patients. Despite being the poorest country in the Western Hemisphere, prices of key generic drugs in Haiti are often higher than the International Reference Price, making them unaffordable for many patients (Chahal, Fort, and Bero 2013; Joseph et al. 2011).

In a January visit to the clinic, Jacmel diocese leaders noted that the x-ray imaging equipment needs repair. Jacmel diocese leaders also wrote that the clinic lacks an ultrasound and sonogram machines and associated supplies (Dieuveille and Léveillé 2019), though HMMW staff have indicated otherwise. They added that CSST recently received an ultrasound machine and training for Dr. Judeson as part of a USAID-Santé technical assistance grant and support as well from a private donor about four years ago (Wakefield 2019b).

**Managerial and Personnel Challenges**

In recent years CSST has displayed managerial and personnel challenges that makes staffing and daily operations of the clinic challenging (Dieuveille and Léveillé 2019). Research has found that “proper human resources management is critical in providing a high quality of healthcare (Kabene et al. 2006). Thus, ineffective leadership, staff retention and absenteeism, skill misalignment, lack of honest dialogue, and an inability to fill vacancies pose significant challenges to CSST’s ability to provide quality patient care. These challenges are further complicated by CSST’s remoteness and Haiti’s political instability and poor infrastructure.
Lack of Effective Leadership and Business Management

As can be seen in the Figure 1, the parish priests control the clinic, including the board of directors and human resource management (Wakefield and Roberg 2019b). The success of CSST is very tied to the interest and involvement of the current parish leadership. As such, the most recent parish leader did not show interest or involvement in the clinic, thus contributing to the human resource deterioration. Moreover, CSST has a full board of directors, which is mostly comprised by parish elders and council whose only experiences in healthcare are being patients at CSST. The board lacks the power of authority to make decisions (Dieuville and Léveillé 2019; CSST 2018b; CSST 2018c)

Figure 1. Staff Flow Chart

Centre de Santé Sacré-Cœur de Thiotte

Parish Priests
General Director: Father Pere Jocelyn Compere (Permanent)/ Father Valery (Interim)

Personnel, Executive Director

Board of Directors

Accountant
Elders of the Church (4)
Pharmacist

Leadership – Head
Nurse, Guerdia Azor

Community Health Workers (8)
Community Health Service Assistant

Leadership – Technical
Director, Dr. Judeson Jean

Attending Physician
Auxiliary Responsible Archive and Stock (and recruit)
Dr. in Care
Laboratory Technologist (and recruit)
Nurse Aid
Nurse (2)
Nurse Practice (Midwife)
Obstetrician
Resident Dr. in Social Service
Social Service Physician
Ultrasound Technician
X-Ray Technician
24/7 Physician

Leadership – Administrator

Accounting
Cashier
Chauffeur
Consultant
Facility Manager
Housekeeper (2)
Midwife in Residence
Pharmacist
Pharmacist Manager
Security (2)

1 Red indicates vacant staff positions. Blue indicates HMMW funded postions. Source Dieuville and Léveillé 2019; CSST 2018b; CSST 2018c
They do not understand the full extent of their own power in management decisions and roles are undefined.

The CSST facility administration is also ineffective. The administrator quit in December 2018 and the position remains vacant. Hours are scheduled irregularly, and rotations are difficult (Dieuveille and Léveillé 2019). Thus, although there are dedicated and educated employees at the clinic, the lack of oversight diminishes not only administrative decision making (Léveillé 2019), but also accountability within and sustainability of the clinic.

**Staffing Challenges**

Staff currently suffers from low morale due to being overworked and underappreciated (Dieuveille and Léveillé 2019). Holidays and birthdays are no longer celebrated, and the atmosphere is unfriendly. There are no showers or cafeteria for patients, and employee dormitories are significantly inadequate with no showers or electricity (Dieuveille and Léveillé 2019). Staff reported being surprised that the clinic was still functioning due to the lack of communication over the last six months (Dieuveille and Léveillé 2019).

Vacant positions (in red on Figure 1) are so prevalent that it is difficult to perform needed services, and current staff lacks clear leadership. Dr. Judeson, the technical director and primary physician, works a significant amount of overtime and hired an additional doctor paid out of his own salary. This is unsuitable to HMMW, as they pay his salary (Roberg 2019b). Furthermore, he handles the day-to-day operations (Léveillé 2019). See Appendix B for a detailed list of CSST’s staff.

**Recruitment Challenges**

At CSST, the parish priests have full control of the hiring and firing of employees. Recruitment is done through word of mouth and may be based on religious affiliations (Wakefield and Roberg 2019b). This means staff might not have the appropriate training and expertise to be successful in their position. HMMW is trying to avoid this by setting the expectation that CSST create position descriptions with USAID-Santé’s guidance. The HMMW funded positions (in blue in Figure 1) bypass the priests, ensuring that these positions are staffed by people who have expertise and training. An additional complication is that medical doctors, advanced practitioners, and other staff are disinclined to apply to open positions or work at CSST due to Thiotte’s remoteness (Wakefield 2019d).

It is important to note here that Haiti is currently experiencing a “severe shortage of health workers including doctors, nurses, and midwives” (Stewart and Charles 2017). There are only 0.65 doctors, nurses, and midwives per 1000 people, which is below the World Health Organization’s recommendation of 4.45 (Stewart and Charles 2017). Eighty-eight percent of public healthcare workers are concentrated in urban areas - even more problematic to Thiotte. Moreover, Haiti has an outmigration problem of healthcare professionals. In an initial survey, USAID’s Health Finance & Governance Project (2018) found 14 percent of midwifery, 35 percent of nursing, and 27 percent of medical students plan to practice overseas after training.

**Patient Care Challenges**

CSST is well-respected and important in Thiotte. However, the remoteness of the clinic makes it difficult for patient follow-up and referral. As CSST possesses neither the resources nor
the staffing to perform particular services, patients are sometimes referred to other clinics and hospitals (Wakefield and Roberg 2019a). This proves problematic as many of these patients then have to travel great distances to receive care.

**Staff Training and Development Challenges**

In Haiti, there is no requirement for continuing education to renew a medical license (SBHF 2018b). Due to this, as well as other factors such as limited resources and high practitioner-to-patient ratios (Holm and Burkhartzmeyer 2015), continuing education for medical professionals is a low priority for many hospitals and clinics. However, studies have shown that continuing education for medical practitioners in low-resource countries increases staff retention and job-related motivation, resulting in positive staff morale (Clark et al. 2015). CSST staff have expressed having low morale due to the feeling that their requests are often not taken into consideration (in the original French, “Les requêtes ne sont pas toujours prises en considération.”). As it appears that CSST does not currently have a training program, and HMMW is interested in expanding its partnership with the clinic to facilitate staff training and skills coaching beyond what already occurs during the medical mission trips.

**Administrative Challenges**

CSST displays inefficient or inadequate administrative practices that make it difficult to monitor and evaluate programming, track and defend spending, sustain clinic infrastructure and operations, and collect information on patient outcomes and satisfaction. It is worth noting that these shortcomings are not exclusive to the remote settings present here. Books have been written on best practices for monitoring and evaluating social programs throughout developing countries (See, for example, Valadez and Bamberger 1994). However, the clinic’s remoteness exacerbates the negative effects of its administrative challenges and HMMW’s difficulties in rectifying them. Of particular note for CSST are inadequate bookkeeping, monitoring of facility operations and maintenance, and oversight from HMMW.

**Inadequate Bookkeeping**

Both HMMW and potential funders have noted with concern the lack of adequate financial documentation and management at CSST. HMMW reports that it is often difficult to request documentation from CSST, with requests often being delayed for weeks or ignored altogether. When financial documentation is received, it is often inadequate by common accounting standards or arithmetically inaccurate. For example, a recent financial report from the clinic listed such expenses as “for the sale of medicine at the pharmacy” and “emergency” (in the original French, “Pr compt la vente de medicament a la pharmacie” and “urgence”) without further explanation (CSST 2018a). In other recent documents, annual calculations do not match quarterly summations and it is occasionally unclear if figures are in U.S. dollars, Haitian gourdes, or both.
Facility Operations and Maintenance

A recent report from the Vice Chancellor of the Diocese of Jacmel noted numerous building concerns, such as half-painted exterior walls, a partial roof collapse in the patient entrance area, fissures in the maternity care area, detached tiles in treatment rooms, and an overflow of medical equipment in visitor spaces (Dieuveille and Léveillé 2019). The report further noted that patient rooms are so uncomfortable that patients occasionally refuse to enter them (Dieuveille and Léveillé 2019). Upon examination of available documentation, CSST does not appear to have an employee dedicated to tracking facility needs.

HMMW Oversight

The two issues above combine to result in the inability of HMMW to support, monitor, and evaluate CSST. As mentioned above, HMMW has faced extreme difficulty obtaining necessary documentation from CSST, either because said documentation is inadequate or nonexistent, or because CSST staff do not readily provide it. Without a reliable agent in Thiotte to provide this documentation, HMMW cannot make appropriate recommendations or obtain further funding. Addressing this lack of oversight ability is important for ensuring the continued and sustainable success of HMMW’s partnership with CSST.

Recommendations

Despite the many challenges, HMMW is committed to its healthcare focus in Thiotte through partnering with CSST (Wakefield and Roberg 2019b). The sections below speak to best practices in mitigating the challenges facing CSST and present potential solutions HMMW and CSST can undertake to address these challenges. The sections will organize these potential solutions in short (can be started in the next two years), medium (can be started in the next five years), and long term action plans (anything longer than five years). Beginning with the topic of infrastructure, then addressing the issues of management, personnel, and staff training, and ending with the topic of administration, this paper will culminate in a summary of recommendations for HMMW and CSST. These recommendations will include cost estimates when possible as well as an analysis of the ease of implementation of each recommendation.

Infrastructure, Resources, and Facility Solutions

The following recommendations are designed under the assumption that existing large infrastructural challenges, such as poor road quality and limited connectivity, will remain the status quo. It should also be noted that leadership and administrative improvements at CSST are critical for improving the functioning of the clinic. With that said, we believe that certain basic infrastructural improvements will be necessary as first steps towards improving clinic operations thereby creating a better environment for leadership and administrative adaptations. Also, this section contains numerous references to companies and organizations that are relevant to the recommendations. They were named in order to provide specific examples of companies and
organizations working in their respective areas, not as a statement that they are the necessarily
the specific groups with which HMMW should work with.

Electricity Solutions

**Short term:** In the short term, HMMW could install multiple pico photovoltaic (PV) systems for the clinic. Pico PV systems are very small solar electricity generating systems that are typically used in off-the-grid rural homes in developing nations. They are in use around Haiti through government subsidized programs (Felicien 2018) and therefore likely for locals to be familiar with the maintenance of these systems. A pico solar energy system would be used to provide lighting for a small network of LED lights connected to an energy storage battery. Such a system could be used to provide basic lighting in staff housing or other high-priority places but would not be relevant for application clinic-wide. Individual pico solar energy systems are affordable, costing between $50-250, and can provide one to ten watts of power depending on size (Lysen 2013). It is likely that CSST would require four to five systems, costing $200-2500. See Appendix C for energy usage estimates and see Lysen 2013 for more detailed cost estimates of pico PV systems.

**Medium term:** There are a couple of options to supply the electricity needs of CSST in the medium term. The first option is to continue with previous methods of electricity generation and procure a new 27 kilowatt (kW) generator, 60 KVA (48 kW) generator, replacement power-storage batteries, other electricity system accessories, and necessary power generation upgrades, as proposed in HMMW’s 2017 USAID American Schools and Hospitals Abroad (ASHA) grant proposal (HMMW 2017). This option would total $42,500 for equipment, with the 27 kW and 60 KVA generators making up $15,000 and $18,000 of the cost, respectively (HMMW 2017).

The second, preferable option is to invest in a solar electricity system to fulfill the clinic’s energy needs. Photovoltaic energy is not only less locally polluting than diesel generators, but it can eliminate dependency on costly, unreliable fuel shipments (UNDP 2015). PV electric systems are a cost-effective solution and have been deployed to power remote medical facilities in least developed countries across the globe (SELF n.d.; UNDP 2015). Now is also an ideal time to invest in renewable energy sources. In September 2017, the Haitian government removed all import tariffs and duties for solar production-related materials. Haiti has a high solar energy potential that is relatively uniform across the country. It receives average annual sunlight similar to Phoenix, the U.S.’s sunniest city (Lucky et al. 2014). Thus, “with the high cost of imported diesel, solar is cost competitive and with financing is immediately cost advantageous in Haiti” (Yeoh 2018).

A 75 kW PV system, the same total energy production capacity as requested in HMMW’s 2017 ASHA application, would be an expensive but potentially financially worthwhile investment. For reference, installing a 75 kW solar energy system in the U.S. would cost approximately $210,000 (Barbose and Darghouth 2018). Given the customizable nature of PV system installation and communication challenges with Haiti, it has not been possible to obtain a precise price estimate for installation of a large PV system in Thiotte. Despite the likely high cost, it is worth exploring this option as solar electricity systems can eventually pay for themselves in savings received from no longer relying on diesel fuel for power generation. The actual cost savings received from a solar energy system is, of course, dependent on many factors including fuel prices and PV system cost. There are a number of Haiti-based solar energy companies, such as DigitalKap and Sigora, which are experienced in working with international NGOs to install solar electricity systems large enough for a clinic (DigitalKap n.d.; Sigora Haiti
n.d.). As with any technology investment, if installed at the clinic, it will be imperative to train staff members on how to properly use the PV system and to identify local technicians for upkeep and repairs.

**Long term:** While it is likely to be a lengthy process, HMMW should seek to establish relationships with energy-focused microgrid companies with the goal of working to establish a larger energy grid for Thiotte. There are even a few growing companies that are working specifically to tackle the challenge of providing solar power to remote Haitian communities. One such example is Chicago-based Sigora, which focuses on the installation and implementation of microgrids, locally powered and controlled electrical grids across Haiti. Their “complete energy management system incorporates smart metering hardware, revenue and demand management software, remote monitoring capabilities... all engineered for frontier markets. The result is reduced connection costs, 100% bill collection, and more efficient energy management” (Sigora Haiti n.d.). There are other innovative competitors, such as 10Power, a company which invests in renewable energy projects in remote areas that can be repaid over time (10Power n.d.). It is also worth exploring the possibility of partnership with a solar energy company to install a large solar array at CSST which can provide power beyond the needs of the clinic. Surplus energy could then be sold to the residents of Thiotte.

Furthermore, it is worth examining whether the existing defunct power grid in Thiotte (HMMW 2017) could be retrofitted and upgraded for the distribution of a sustainably powered energy source. For additional examples of best practices for microgrid deployment and case studies, refer to Schnitzer et al. 2014.

**Water and Sanitation Solutions**

**Short term:** There are many examples of simple, inexpensive, and effective filtration systems developed in order to purify potable water without electricity. The current industry standard is the filtration system manufactured by Sawyer International, which costs $20.50 per filter (Vincent 2019). Sawyer filters can be affixed to any standard bucket to create a water filtration system. They are in use in Haiti and around the world in homes, schools, and remote clinics (Sawyer International n.d.). As an immediate and short term water filtration solution, HMMW should invest in 20-30 low-cost, electricity-less filtration systems and buckets to be placed in main areas around the clinic and filled by hand. This would cost an estimated $410-615 for filters as well as another small sum for the purchase of 20-30 plastic buckets in Haiti. There are many NGOs, such as Clean Water for Haiti, Hope for Haiti, and Pure Water for the World, already distributing similar water filtration systems across the country that can be contacted to learn best practices for bucket filtration systems. Regardless of the specific decisions taken, investment in basic water purification systems for CSST is critical in the short term.

**Long term:** HMMW and CSST should continue seeking funds for the water filtration and pumping system as proposed in HMMW’s 2017 ASHA grant application. In the long term, a centralized water purification system will be necessary to ensure ease of potable water accessibility. Pumping water from the local river with a new pump and piping system would also reduce, or hopefully eliminate, the issue of water shortages. A reliable potable water supply has the potential to create “an opportunity for expanded services, including dental hygiene care,” which was requested by community members in a 2016 survey (HMMW 2017). The 2017 ASHA grant application attachment MA1 lists the cost of the filtration system at $15,000, while the cost of the pumping system is not listed (HMMW 2017).
It should be noted that both a centralized water filtration system and pumping system are secondary to establishing a safe and reliable solution to the clinic’s electricity needs, as pumping and filtration are both highly electricity-dependent.

**Medicine and Other Resource Solutions**

**Short term:** The shortages of drugs and medical supplies at CSST can be alleviated with improved management techniques and planning. A better-managed supply chain has the potential to reduce costs, improve access to necessary medicines and resources, and improve patient care. Discussions with the HMMW trip committee chair indicate that there is room for improvement in the inventory and ordering system (Roberg 2019b). In order to improve the regularity with which common medical and supplies are available at the clinic, HMMW should assist CSST in adopting a new distribution style for their medical supply chain.

There are two main types of medical supply distribution systems: “push” and “pull.” In a push system, a predetermined variety of medicines and supplies is sent from a supplier on a predetermined basis. This technique is generally used in disaster-response and when lacking data about supply needs. In a pull system, resource requests are sent from the clinic, ideally before they are needed. Medicines and supplies are then stored at the clinic until needed. This requires ongoing management in order to be successful (WHO n.d.).

Improving the availability of essential medicines at the clinic should be a priority as it will greatly increase the quality of patient care. Owing to the fact that CSST lacks medicine consumption data, HMMW should work with Dr. Judeson and the pharmacist in order to customize a list of necessary medicines at CSST, as guided by the World Health Organization’s “WHO Model List of Essential Medicines” (WHO 2017). They would then need to create a push-style distribution so that Dr. Judeson can return with a pre-arranged list of medicines from Port-au-Prince on a weekly basis. Simplification of the order and procurement process will serve to increase the availability of medicines at CSST. Though this may reduce the variety of medicines and supplies available, the purpose is to increase the likelihood that basic supplies are predictably available at CSST. The pharmacist must also track the consumption rates of medicines and other supplies. The details of this medicine procurement process should be included in both of their job descriptions in order to ensure accountability.

**Medium term:** If properly managed, CSST will eventually have enough consumption data in order to switch over to a pull-type distribution system in the medium term. In a pull system, Dr. Judeson or the pharmacist would place advanced customized medicine and medical supply orders. They would base their orders contents and quantities off of the data of the speed with which CSST patients used medicines and supplies in order to ensure that the clinic does not run out of necessary resources.

**Connectivity: Internet and Telephone**

**Medium term:** Due to the very large-scale communication infrastructure upgrades needed in order to support improved internet and phone connections in Thiotte, HMMW should prioritize on improving the reliability of its access to the internet by upgrading CSST’s electricity production capacity. See electricity solution recommendations above for more information.
Managerial and Personnel Solutions

This section outlines industry best practices to address the challenges described above pertaining to leadership, staffing, patient referral, and staff training in a rural, developing context. These recommendations have been grouped into the following: establish qualified leadership and build administrative capacity, formalize human resource practices, better patient care, and staff training.

Establish Qualified Leadership and Build Administrative Capacity

*Short term:* CSST should establish a qualified leadership structure in order to set the expectations of staff and operations within the health clinic, as studies have found that “most of the problems of healthcare systems are due to poor communication and leadership” (Ghiasipour et al. 2017, 1). In fact, “appropriate leadership can create an organizational culture that is committed to quality, reducing conflicts, improving efficiency and productivity of teams, enhancing staff satisfaction, advancing hospital performance, and finally, meeting personal and organizational goals” (Ghiasipour et al. 2017, 1). Therefore, CSST should reorganize their board of directors as proposed in the first draft of the memorandum of understanding (MOU) to include seven members “who can offer a diversity and balance of perspective, each with one vote” (Wakefield and Roberg 2019a). These board members should “work as a group to clearly define their roles and mission, and in specialized individual roles” (Dutra 2012). HMMW can look to Saint Boniface, whose members come from a wide range of professions, or the management board at the Hospital of Sacred Heart of Milot (HSCM), where members have specifically designated roles and responsibilities at their clinic (USAID Health Finance & Governance 2016). Like HSCM, all staff hiring and firing should be signed off by the chair member of the board, and operations should be managed by standards set by the board (USAID Health Finance & Governance 2016). Reorganizing and strengthening the board will increase leadership capacity at the organization and provide direction in operations, strengthening both accountability and sustainability.

HMMW should monitor that those in positions of authority have the necessary expertise and skills, including, but not limited to, problem solving, risk taking, communication and teamwork, and experience (Ghiasipour et al. 2017). Managers should then be monitored and evaluated to ensure that they are performing to standards set by HMMW in consultation with CSST. The World Health Organization’s process for supervision can be seen below (World Health Organization n.d.).
Medium term: After strengthening leadership, CSST should work on improving organizational culture as it has “a significant and positive effect on the efficiency and effectiveness of the hospitals studied” (Kabene et al. 2006). CSST should disseminate an organizational hierarchical chart similar to Figure 1 so that employees understand who they report to and the management organization at the clinic. The organization of this chart is also in line with the below chart which was created by the Haitian Ministère de la Santé Publique et de la Population (MSPP) in collaboration with USAID. This chart was recently presented to donors in order to strengthen human resources specifically in Haiti (USAID Health Finance & Governance 2018).
Formalize Human Resources Practices

Short term: Clear position roles and job descriptions help to improve communication between leadership and staff, encourage organization, identify training needs, better target applicants in recruitment, and provide performance expectations (Ontario Tech University n.d.; Stup 2012). In the short term, CSST should assign clear roles to staff, create position descriptions, and build staff morale. CSST should work in collaboration with USAID-Santé, who can provide technical assistance relevant to position descriptions, job titles, compensation, and staff recruiting (Wakefield and Roberg 2019b; Wakefield 2019e). Once drafted, HMMW should review the descriptions and ensure that they provide applicants with an understanding of their roles and expected responsibilities (Royer 2010). They also must ensure that the description is accurate and up-to-date (LMBC 2019). CSST can use position descriptions from Saint Boniface, Midwives for Haiti, Partners in Health (PIH), and HSCM as examples, as they delineate roles and clearly state the responsibilities and the necessary skills of each position (SBHF 2018a; Midwives for Haiti 2016; Partners in Health n.d.; USAID Health Finance & Governance 2016). This type of human resource management will contribute to staff retention and recruitment (Magnusson 2017), which will, in turn, further build the sustainability of CSST.

Low staff morale can negatively impact staff retention and productivity (Chipeta 2014; Willis-Shattuck 2008). This is problematic as “retention is critical for health system performance” (Willis-Shattuck 2008, n.p.). Both monetary and nonmonetary performance-based professional recognition and celebrations can promote not only quality care (Peabody et al. 2006) but also staff morale (Magnusson 2017). CSST can boost staff morale through offering birthday and holiday celebrations and public recognition and appreciation for staff that excel in their job performance. There are many ways to add celebrations which will affect cost. However, it is important to be consistent (Seah 2016). In addition to building staff morale and team building, other cost-effective and helpful tools in employee recruitment include routine performance reviews, on-time payments, and better communication across CSST (Magnusson 2017; Kappel 2017). However, these actions cannot happen until after leadership becomes clearer and roles are defined.

Medium term: Smartphones are commonly used for communication throughout Thiotte and Haiti and their ubiquity is only expected to grow (Export.gov 2019). Smartphones can be utilized to help transform healthcare quality and employee management (Ventola 2014; MEASURE Evaluation n.d.; and Holeman, Cookson, and Pagliari 2016). In order to streamline scheduling and operations, CSST could utilize different smartphone applications. Specifically, CSST could partner with Medic Mobile, which specializes in healthcare phone applications, to utilize its Community Health Toolkit to track staff performance, scheduling, employee communication, maintain patient files, and manage the pharmacy stock. The application does not require reliable internet to function. See Appendix D for a description of Medic Mobile and its existing partners in Haiti as well as the Community Health Toolkit. Partners pay for the direct costs and pricing can vary depending on resources (computer, wireless phones, GSM Modem, etc.) already available. Training will be an additional fee and after set-up, the monthly cost will only be airtime (Medic Mobile n.d.). It should be noted that although this can be done in the medium term, it should not be done until there is an administrator or other staff person who can be responsible for updating and monitoring the application. Integrating the use of a smartphone application should also not be implemented until there is defined leadership at CSST.

Long term: Not being able to recruit employees will further compound CSST’s staffing challenges. World Bank points that “interventions [recruitment] need to be implemented in
bundles, combining different packages of interventions according to a variety of factors influencing health worker’s decision to work in rural or remote areas and to match the interventions with health workers’ preferences and expectations, since the health worker’s employment decisions are a function of these preferences.” (World Bank n.d.) Per USAID-Santé 2017, 2018, and 2019 research, hardship allowances and decent housing will be necessary for recruitment to Thiotte (Wakefield 2019a). In the long term, CSST should move towards the Partners in Health approach. Although they pay less at their rural clinics than private clinics, they have some of the most sought-after residency clinics (Magnusson 2017). The program directors credit it to the “quality of the clinic facilities, which are stocked with essential medicines and technology so that health workers are not frustrated by their inability to provide care” (Magnusson 2017). Additionally, PIH offers other incentives to their employees including transport back to cities to visit their families, lodging and food, satellite internet service, access to medical reference material and patient management systems, and opportunities to collaborate with international researchers, publish in journals, and speak at conferences. Similarly, the World Health Organization has identified the following incentives that may be utilized to recruit workers in other least developed countries: continuing education, increased salaries and hardship allowances, providing decent housing, and good infrastructure (Kolstad 2011). This is similar to what was proposed in HMMW’s USAID-ASHA application.

**Better Patient Care**

**Medium term:** Better patient referral is crucial in providing patients options to other clinics when CSST does not have the necessary skill levels or lacks the required resources. Partners in Health developed a system to refer patients to other hospitals that utilizes software which allows them to track patient data and forward it to the referred hospital (Partners in Health 2014). This helps PIH perform follow ups from their mobile clinic visits. While noting that it was a challenge to put the system into place, it made a “huge difference in ensuring patients receive the care they need.” (Partners in Health 2014, n.p.) Referral systems are usually done in partnership with other hospitals, which HMMW may be able to explore as the Bishop of Jacmel has connections with the St. Francis de Sales Hospital in Port-au-Prince, but they can be costly (Hensher, Price, and Adomakoh 2006).

In Haiti, the Ministry of Agriculture used text messaging systems to promote rabies vaccinations campaigns throughout the country in 2018 (Moloo 2018). In a similar fashion, CSST could utilize smart phone applications, such as Medic Mobile, to send text messages to patients and improve patient care through the scheduling of follow ups and reminders.

**Long term:** In order to minimize traveling costs to patients, CSST should demolish and reconstruct the lower building as it is has been deemed unsafe and unusable for patients (HMMW 2017). If CSST were to construct a new building as proposed by HMMW in the USAID-ASHA report, not only would it be able to provide locum tenens and rotating employees with a suitable residence, and thus help in both retention and recruitment, but patients would also have a better overall care experience and the building could be used for community education (HMMW 2017). In conjunction with the employee residencies, this would cost the organization $813,000 for construction and $164,000 for commodities (HMMW 2017, 18).
Short term: A 2015 study of the training partnership between Mayo Clinic and St. Luke Hospital in Haiti provides some viable options, although not all components of their program would easily apply to CSST. Due to the “lack of relevant research into long term, partnered educational methods used in developing countries” (Holm and Burkhartzmeyer 2015, 1) the partnership designed their own continuing education model consisting of three phases.

During the first phase, American medical staff worked with Haitian colleagues to provide direct patient care. The second phase of the continuing education process consisted of in-person educational sessions on healthcare topics (Holm and Burkhartzmeyer 2015). Sessions began with a short lecture followed by the presentation of hypothetical cases as well as applications of the new material to patients currently in the hospital. Each session ended with an evaluation to verify that the topic was relevant and the method of delivery effective. The third phase intended to utilize the train-the-trainer approach by teaching Haitian medical professionals new topics through telemedicine so that they could, in turn, impart this knowledge to the rest of their staff. While the concept that “e-learning could be a valuable tool to provide updated medical information… by enabling [staff] to engage in continuous learning when there are limited teaching resources” (Holm and Burkhartzmeyer 2015, 3) proved accurate, the second step of further knowledge transfer to staff largely did not take place. This was due to the fact that there was “not enough time away from patient care” (Holm and Burkhartzmeyer 2015, 7) to disseminate the information. However, the initial training portion of this phase did prove useful and consisted of video lectures stored on a secure internet platform. One of the challenges of this system was that many of the Haitian staff were “unaccustomed to computers… and using the internet,” but the telemedicine portion of this phase was still “deemed beneficial” by Haitian staff (Holm and Burkhartzmeyer 2015, 7).

Due to HMMW’s decades-long relationship with CSST, the partnership, trust, and buy-in mentioned in this study’s phase one would be easier to establish. Years of working in collaboration with Haitian medical professionals on mission trips have also provided HMMW medical volunteers ample data to determine needed continuing education topics, and this list can be supplemented through further communication with Dr. Judeson and nursing staff. While limited resources prevent HMMW from extensive in-person training and thus phase two cannot be implemented, sections of phase three can, with certain alterations, serve as a roadmap for CSST staff training in the near future.

Following the model in this study, HMMW should collaborate with CSST staff to determine the most needed training topics. HMMW staff and volunteers will need to be recruited to create computer-based training modules for each topic. These modules would take the form of PowerPoints with embedded videos stored on a flash drive, eliminating the added logistical challenge of internet connectivity. Since the modules would not require the internet, they would be simpler to use, and if loaded on a flash drive, could be accessible on any computer at any time. The study mentioned time as a challenge for training due to high practitioner-to-patient ratios, and considering the fact that CSST has similar challenges, carving out time in the CSST staff’s schedules to participate in these training modules will be tantamount to the success of the continuing education. A process of accountability would also be helpful. Initially, this could take the simple form of the buddy system, a requirement that medical staff go through each module with a partner. See Appendix E for video module cost estimates.

Medium term: In the recently published USAID Strategic Framework for Haiti, the American government laid out its goals for Haiti in 2018-2020. As defined in this document, the
mission of USAID is to prioritize programs that incentivize reform, strengthen in-country capacity, and mobilize domestic resources (USAID 2018). USAID also prioritizes local solutions and investing “in strengthening the capacity of local partners to manage programs” (USAID 2018, 8). An in-person and online training partnership between Haitian medical facilities, as will be described below in the long term section, corresponds directly to USAID’s stated priorities, which is why the medium term action HMMW could undertake is to apply for another USAID grant or other funding by leveraging the above-mentioned training work already being done.

**Long term:** The Beyond Expert Program, a continuing nursing education program created by Partners in Health at its University Hospital of Mirebalais, provides potential partnership opportunities for HMMW and CSST. The newly opened 300-bed facility north of Port-au-Prince sees as many as 700 patients a day and was specifically designed to be a training hospital (Hôpital Universitaire de Mirebalais 2019). The Beyond Expert Program was developed to meet the needs of the new hospital which offers advanced care services such as an ICU. Since “no formal opportunity for specialized critical care training exists [for nurses] in Haiti” (Clark et al. 2015, 58), Partners in Health collaborated with local stakeholders to design their own program. They not only developed modules to teach specific skills; the program designers also divided the modules by levels of expertise, offering the same subjects at novice, beginner, competent, and proficient levels. The modules were all based directly on the local context and available resources, and they addressed a range of nursing topics beyond the purely technical to include skills such as critical thinking, interpersonal, leadership, and conflict resolution. Using participatory teaching methods and simulations as well as evaluating and monitoring practice in the field, the Beyond Expert Program addressed time constraints by scheduling the training in cohorts that rotated through the modules together.

Mirebalais is in central Haiti, north of Port-au-Prince, which is a 93-mile drive from Thiotte. Traveling such a distance over difficult roads for the sake of medical training would be challenging but not impossible. A more time-effective solution would be to collaborate with Partners in Health and University Hospital of Mirebalais through telemedicine, effectively enrolling the CSST nursing staff into the Beyond Expert Program as an additional cohort. By sending one or two senior nurses to University Hospital of Mirebalais to participate in the program before enrolling all CSST nurses in the Beyond Expert Program through telemedicine, those senior nurses could serve as the monitors for the program in Thiotte. Such a program would only be viable after electricity in the clinic is made more reliable and if connectivity improves.

While the University Hospital of Mirebalais is not the only hospital with which CSST could partner, the Beyond Expert Program was chosen for potential partnership due to the fact that it was the focus of an academic study and has proven results; see Clark et al. 2015 for further information. Other hospitals, such as St. Francis de Sales Hospital in Port-au-Prince, may also serve as effective training partners.

**Administrative Best Practices**

The administrative challenges section above describes current administrative challenges faced by CSST. This section outlines industry best practices to address traits of these challenges under the following topics: memorandums of understanding (MOUs), bookkeeping, and facility management.
MOUs

*Short term:* MOUs are invaluable documents that can help outline all parties involved and their respective current and future responsibilities. In a recent case study of why a Canadian charity struggled to facilitate good management of a clinic they opened in Mali, lack of an MOU was given as a reason for many of the misconceptions (McLellan and Madeley 2013). As HMMW and CSST have already partnered for years without an MOU, this may not be a critical limitation. However, the development of an MOU should still be pursued over the short term to more clearly lay out clinic and personnel responsibilities. There are numerous formats that could be used for a potential MOU, but it is important the document is “developed through a process of negotiation and mutual assent” (Johnson and Sterthous 1982). A document that may be of use for this process is the U.S. Department of Veterans Affairs’ guide to developing MOUs with telemental or traditional health clinics (Kaufmann et al. 2015).

Bookkeeping

*Short term:* Healthcare facility bookkeeping is a frequent issue in least developed countries. This has resulted in researchers developing workaround methods to analyze remote healthcare facility costs, of which two methods are most applicable in this situation: activity-based costing and step down accounting. Activity-based costing, which has been successfully implemented elsewhere in Haiti, including at Partners in Health, involves training one local data collector to record the time recordings and patient characteristics of every fifth patient (McBain et al. 2018). A distant analyst (i.e. an HMMW volunteer) could use these data combined with a calculated capacity cost rate for each type of resource, personnel, equipment, and space to determine activity-based costs for the clinic. See McBain et al. 2018 for a more detailed explanation. Conversely, step down accounting has been successfully used in determining unit costs of remote healthcare facilities (Conteh and Walker 2004). This is done by ranking cost centers within an organization (e.g. pharmacy, personnel, or administrative costs) and identifying and assigning inputs from the top level, likely personnel here, to lower levels. See Conteh and Walker 2004 for a more detailed explanation. By combining this process with tracking units of activity for each cost center, unit costs can be computed for each of the identified centers.

Given its simple nature to understand and implement, activity-based costing is the recommended method for CSST to obtain short term cost-effective measures of care. Additionally, the average costs calculated with this method could be compared with those published for other Haitian clinics in McBain et al. 2018 to determine benchmarks for CSST’s cost and time performance. While this option would require minimal monetary expenses, such as digital clocks for precise tracking, it would require further buy-in on the part of CSST administrators and staff as well as significant time investment from an HMMW volunteer.

*Medium term:* While both activity-based costing and step down accounting can be used as a workaround to CSST’s paucity of accounting and budgeting in an effort to prove cost effectiveness to funders, they both rely on external analysis by HMMW volunteers and/or additional training and buy-in of CSST staff. Ideally, over a medium timeframe, one or more CSST employees will make the transition to more traditional accounting and bookkeeping methods to establish a more self-sustaining system.
Facility Management

Short term: While fixing current facility defects is a more pressing priority as discussed above, in the short to medium term, CSST’s facilities should be managed at a higher degree to ensure problems can be avoided or addressed before becoming more costly. A traditional facility manager operates on both strategic-tactical and operational levels, overseeing activities from fire safety to cleaning to tendering. See Atkins and Brooks n.d. for a more detailed explanation. There are varying degrees to which facility management can move from being entirely internal or entirely through an external contractor (Probst-Wallace n.d.). Given CSST’s small size, the role would ideally be covered entirely by one or the other. HMMW has budgeted to support an internal facility administrator in the coming fiscal year. Considering the salary paid to other administrative staff at CSST, this position could most likely be filled for at or under $8,000 per year. Once filled, oversight should be maintained by HMMW to ensure this administrator sufficiently performs his or her duties so that on a medium term basis, CSST can adopt a stable facility management process and culture.

Conclusion and Next Steps

Below is a menu of the previously described recommendations. They are organized according to short, medium, and long term actions as well as low, medium, and high costs. Estimated costs are included when possible and are only item estimates, not staff time or other associated opportunity costs.

Actions are divided into three approximate time horizons. Short term actions should be implemented within the next two years, actions identified as medium term should be implemented within the next five years, and actions identified as long term should be implemented after five years. In some instances, such as the case with managerial and personnel recommendations, this will help to ensure that the appropriate structures are put into place before more extensive endeavors are undertaken. Costs are divided into three approximate categories, low (<$1,000), medium ($1,000-10,000), and high cost (> $10,000). We recommend that HMMW collaborate with CSST to pick a range of these recommendations. HMMW and CSST should consider what combination will first best promote accountability and future sustainability at CSST as well as help forge partnerships and draw in supporters, both financial and in-kind.

In the future, HMMW can utilize multiple UW-Madison courses. Specifically, in the fall of each year, La Follette offers PA 881, Cost-Benefit Analysis. We encourage HMMW to apply as a client project to have students further quantify and evaluate the costs of these recommendations against their benefits. This would help HMMW identify and target the most cost-effective solutions to CSST’s challenges. Additionally, we encourage HMMW to apply to CSCS 801/MHR 765, Nonprofit Board Leadership Development. The course allows for students to sit as a nonvoting member on nonprofit boards and write an independent governance project based on the organization’s challenges. Related to CSST’s challenges, the students can learn and recommend solutions to roles and responsibilities of board members, financial management, strategic planning and collaboration, fund development, structures, and board/staff partnership (Johnson et al. 2018). UW-Madison also has a Public Health Department and houses the Global Health Institute, an organization which exists to “advance equitable and sustainable health across
Wisconsin and the world” (GHI 2019). As such, there may be more opportunities for collaboration beyond La Follette courses, such as the French Department.
<table>
<thead>
<tr>
<th>High Cost</th>
<th>Medium term Action</th>
<th>Long term Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar Panel Electricity System, estimated $210,000 (cost in the U.S.)</td>
<td>Partner with NGOs for Electricity Microgrid, estimate not available</td>
<td></td>
</tr>
<tr>
<td>Water Filtration and Pump System, estimated $15,000 for filtration and unknown for pump</td>
<td>Hardship Allowances and Incentives, varying costs</td>
<td></td>
</tr>
<tr>
<td>Construction of Lower Building, estimated $813,000; Commodities, estimated $164,000</td>
<td>Construction of Lower Building, estimated $813,000; Commodities, estimated $164,000</td>
<td>Partnership with Beyond Expert Program, estimate not available</td>
</tr>
<tr>
<td>Medium Cost</td>
<td>Low Cost</td>
<td></td>
</tr>
<tr>
<td>Video Modules, estimated $1620+</td>
<td>Pico PV Systems, estimated $200-2500</td>
<td>Implement “Pull” Supply Chain System, no monetary cost</td>
</tr>
<tr>
<td>Hire Facility Manager, estimated &lt;$8,000</td>
<td>Water Filters and Buckets, estimated $450-700</td>
<td>Improve Organizational Culture, no monetary cost</td>
</tr>
<tr>
<td>Mobile Apps, estimate not available</td>
<td>Implement “Push” Supply Chain System, no monetary cost</td>
<td>USAID Grant Application, no monetary cost</td>
</tr>
<tr>
<td>Low Cost</td>
<td>Pico PV Systems, estimated $200-2500</td>
<td>Require Traditional Accounting Methods, no monetary cost</td>
</tr>
<tr>
<td>Water Filters and Buckets, estimated $450-700</td>
<td>Effective Leadership, no monetary cost</td>
<td></td>
</tr>
<tr>
<td>Implement “Push” Supply Chain System, no monetary cost</td>
<td>Assign Clear Roles, no monetary cost</td>
<td></td>
</tr>
<tr>
<td>Implement Activity-Based Costing, no monetary cost</td>
<td>Create Position Descriptions, no monetary cost</td>
<td></td>
</tr>
<tr>
<td>Celebrations, varying costs</td>
<td>Develop an MOU, no direct monetary cost</td>
<td></td>
</tr>
<tr>
<td>Implement “Pull” Supply Chain System, no monetary cost</td>
<td>USAID Grant Application, no monetary cost</td>
<td></td>
</tr>
<tr>
<td>Improve Organizational Culture, no monetary cost</td>
<td>Require Traditional Accounting Methods, no monetary cost</td>
<td></td>
</tr>
</tbody>
</table>
Appendix A: Traveling to Thiotte, Haiti

Thiotte is located in the southeast of Haiti. Although it is just over 60 miles from the Haitian capital Port-au-Prince, the trip takes over four hours and is very difficult (Roberg 2019a). Starting on a city highway, which is paved but pothole riddled and difficult to drive in bad rain, one drives for 22 miles to Fonds Parisian. Once at Fonds Parisian, you begin to drive over two mountains and to the top of the third on a rock road. The road is not well maintained and includes deep potholes (unknown depth) which fill with mud after rainfall as it is a dry riverbed and making it impassable at times (Wakefield 2019e). For the most part, this road is a one lane road with no railings or shoulders and vehicles most honk to alert other drivers they are on the road as well. This difficult road contributes to Thiotte’s remoteness.

Figure 4. Trip to Thiotte

Source: Google Maps
Appendix B: Positions and Staff at CSST

The following table represents a list of staff positions at CSST and, when the information was available, their associated staff name. Those positions that are currently not filled have been indicated as vacant. Not including the board of directors, there are total of 27 active employees included in the staffing chart below. There seems to be a discrepancy in the staffing table below with both the 2018-2019 CSST budget (CSST 2018c) and the January 2019 payroll (CSST 2018d). According to the 2018-2019 budget, CSST has 29 total employees and according to January 2019 payroll, CSST has 24 employees (CSST 2018c; CSST 2018d).

It is important to note that in December 2018 the administrator departed and that sometime between January and April 2019, another employee left and one has died. This information is reflected with “vacant” in the chart below. Additionally, there have been two new hires during this time. Their start date is unclear.

Table 2. Positions and Staff at CSST

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Board of Directors</strong></td>
<td></td>
</tr>
<tr>
<td>General Director</td>
<td>Father Jocelyn Compere</td>
</tr>
<tr>
<td>Advisor</td>
<td>Salnave Saint Louis</td>
</tr>
<tr>
<td>Advisor</td>
<td>Bergelor Exume</td>
</tr>
<tr>
<td>Pharmacist</td>
<td>Jean Wilner Levelt Charles</td>
</tr>
<tr>
<td>Advisor</td>
<td>Mario Lafond</td>
</tr>
<tr>
<td>Advisor</td>
<td>Levoir Wilcinot</td>
</tr>
<tr>
<td>Accountant</td>
<td>James Lafond</td>
</tr>
<tr>
<td><strong>Administrative Staff</strong></td>
<td></td>
</tr>
<tr>
<td>General Director</td>
<td>Father Jocelyn Compere (leave of absence)</td>
</tr>
<tr>
<td></td>
<td>Father Valery (interim)</td>
</tr>
<tr>
<td>Technical Director</td>
<td>Doctor Judeson Jean</td>
</tr>
<tr>
<td>Executive Director</td>
<td>Vacant</td>
</tr>
<tr>
<td>Community Health Charge Nurse/Head Nurse</td>
<td>Guerda Azor</td>
</tr>
<tr>
<td>Administrator</td>
<td>Vacant</td>
</tr>
<tr>
<td>Accountant</td>
<td>James Lafond</td>
</tr>
<tr>
<td><strong>Administrative Support Staff</strong></td>
<td></td>
</tr>
<tr>
<td>Pharmacist</td>
<td>Jean Wilner Levelt Charles</td>
</tr>
<tr>
<td>Pharmacist Manager</td>
<td>Diane Charles</td>
</tr>
<tr>
<td>Security</td>
<td>Augustin Janvier</td>
</tr>
<tr>
<td>Security</td>
<td>Claudy Jean Baptiste</td>
</tr>
<tr>
<td>Cashier</td>
<td>Gener Gabriel</td>
</tr>
<tr>
<td>Chauffeur</td>
<td>Vacant</td>
</tr>
<tr>
<td>Consultant</td>
<td>Gesner Constant</td>
</tr>
<tr>
<td>Position</td>
<td>Staff Name</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>Housekeeper</td>
<td>Malene Sanon</td>
</tr>
<tr>
<td>Housekeeper</td>
<td>Outile Pierre</td>
</tr>
<tr>
<td>Midwife in Residence</td>
<td>Filled, new position (unclear when/if staff started)</td>
</tr>
</tbody>
</table>

**Technical Staff**

<table>
<thead>
<tr>
<th>Position</th>
<th>Staff Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor in Care</td>
<td>Doctor Sophia Sain-Fleur</td>
</tr>
<tr>
<td>Resident Doctor in Social Service</td>
<td>Filled, new position (staff name unavailable; staff member started in March)</td>
</tr>
<tr>
<td>Nurse</td>
<td>P. Frandine Antoine</td>
</tr>
<tr>
<td>Nurse</td>
<td>Miracle Edna</td>
</tr>
<tr>
<td>Auxilliaire (Medical Records &amp; Supply)</td>
<td>Velite Joassaint</td>
</tr>
<tr>
<td>Auxilliaire (Medical Records &amp; Supply)</td>
<td>Velite Joassaint</td>
</tr>
<tr>
<td>Laboratory Technologist</td>
<td>Vacant</td>
</tr>
<tr>
<td>Laboratory Technologist Recruit</td>
<td>Filled (staff name unavailable)</td>
</tr>
</tbody>
</table>

**Medical Staff**

<table>
<thead>
<tr>
<th>Position</th>
<th>Staff Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-Ray Technician</td>
<td>Vacant, new position (X-ray machine needed)</td>
</tr>
<tr>
<td>Ultrasound Technician</td>
<td>Vacant (Doctor Judeson is trained)</td>
</tr>
<tr>
<td>Nurse Practitioner (Midwife)</td>
<td>Vacant</td>
</tr>
<tr>
<td>Obstetrician</td>
<td>Vacant, new position</td>
</tr>
<tr>
<td>Attending Physician</td>
<td>Doctor Jean Judeson</td>
</tr>
<tr>
<td>24/7 Physician</td>
<td>Doctor Sophia Saint-Fleur</td>
</tr>
<tr>
<td>Nurse aid</td>
<td>Vacant</td>
</tr>
</tbody>
</table>

**Community Staff**

<table>
<thead>
<tr>
<th>Position</th>
<th>Staff Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Health Workers</td>
<td>Edgard Pierre</td>
</tr>
<tr>
<td>Community Health Workers</td>
<td>Regener Henry</td>
</tr>
<tr>
<td>Community Health Workers</td>
<td>Pieree Desruisseau</td>
</tr>
<tr>
<td>Community Health Workers</td>
<td>M. Roe Azor</td>
</tr>
<tr>
<td>Community Health Workers</td>
<td>JN March Sanon</td>
</tr>
<tr>
<td>Community Health Workers</td>
<td>Soniel Lafleur</td>
</tr>
<tr>
<td>Community Health Workers</td>
<td>M. Denise Louis</td>
</tr>
<tr>
<td>Community Health Workers</td>
<td>Philippe Jeudy</td>
</tr>
<tr>
<td>Community Health Service Assistant</td>
<td>Vacant</td>
</tr>
</tbody>
</table>

*Source: CSST 2018b; CSST 2018c; CSST 2018d; Dieuveille and Léveillé 2019; Wakefield 2019b; HMMW 2017*
Appendix C: Pico Photovoltaic Systems

The following table can be used to estimate the energy needs for a pico photovoltaic (solar power) system:

Table 3. Pico Photovoltaic Systems Energy Needs

<table>
<thead>
<tr>
<th>Load</th>
<th>Type of service</th>
<th>Watt</th>
<th>hours/day</th>
<th>Wh/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study light</td>
<td>50 lumen</td>
<td>0.5</td>
<td>3</td>
<td>1.5</td>
</tr>
<tr>
<td>Main light</td>
<td>200 lumen</td>
<td>2.0</td>
<td>2</td>
<td>4.0</td>
</tr>
<tr>
<td>Night light</td>
<td>10 lumen</td>
<td>0.1</td>
<td>8</td>
<td>0.8</td>
</tr>
<tr>
<td>Phone</td>
<td>charging (50%)</td>
<td>2.0</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>4.6</strong></td>
<td><strong>14</strong></td>
<td><strong>8.3</strong></td>
</tr>
</tbody>
</table>

Source: (Lysen 2013, 15)

Estimating electricity needs based off of Table 3, above:
Example 1:
How much energy is needed to run 3 main lights for 2 hours/day? 12 Watt hours (Wh)
Explanation 1:
3 main lights x 2 Watts to operate for an hour x 2 hours of operation = 12Wh

Example 2:
How much energy is needed to run 3 main lights for 3 hours/day, 4 night lights for 1 hour/day and charge a phone to 50%? 20.4Wh
Explanation 2:
(3 main lights x 2 Watts x 3 hours) + (4 night lights x 0.1 Watts X 1 hour) + (1 phone charge x 2 Watts x 1 hour) = 18Wh + 0.4Wh + 2Wh = 20.4Wh

Determining the electricity production capacity of a pico PV system
The following table provides an estimate of the energy production capacity of pico PV systems.
Note: There will also be some energy lost in the process of battery storage which is not included in the following calculations. Also, pico PV systems vary greatly in quality and reliability and as such, the following estimates should serve as a general guide only.

Table 4. Estimated Expected Energy Production in Thiotte from Pico PV

<table>
<thead>
<tr>
<th>System Size</th>
<th>Estimated Energy Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>10W</td>
<td>60Wh per day</td>
</tr>
<tr>
<td>5W</td>
<td>30Wh per day</td>
</tr>
<tr>
<td>1W</td>
<td>6Wh per day</td>
</tr>
</tbody>
</table>

Calculated according to (Nemet 2018)
Appendix D: Medic Mobile and Community Health Toolkit

Medic Mobile designs and implements care coordination workflows through a cloud-hosted app that does not need internet connectivity to function. It has partnered with organizations in Africa, Asia, and the Americas, including Haiti (Medic Mobile n.d.). Their mission is “to improve health in the hardest-to-reach communities” and their software “supports health workers delivering equitable care that reaches everyone” (Medic Mobile n.d., n.p.). It serves as the technical lead to the Community Health Toolkit, which “helps health workers ensure safe deliveries, track outbreaks faster, treat illnesses door-to-door, keep stock of essential medicines, communicate about emergencies, and more” (Medic Mobile n.d., n.p.). The company provides multiple, customizable tools that would allow for CSST to track staff performance, scheduling, communication among each other, patient files, and medicine management.

Medic Mobile currently has standardized do-it-yourself tool packages for Antenatal Care that are free to download with costs depending on resources already acquired. We were not able to get costs as Medic Mobile did not respond to our request for a quote. They are offered in multiple languages, including French (Medic Mobile n.d.). The Community Health Toolkit that CSST would customize is not free to download. We were unable to get pricing for this as Medic Mobile needs specific details about CSST’s resources and specific management and clinical needs.
Appendix E: Staff Training Video Modules Cost Estimate

Table 5. Video Module Production Costs

<table>
<thead>
<tr>
<th>Materials/Services Needed</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Laptops</td>
<td>$1000</td>
</tr>
<tr>
<td>2 Portable solar laptop chargers*</td>
<td>$600</td>
</tr>
<tr>
<td>Content Translation**</td>
<td>$0</td>
</tr>
<tr>
<td>Flash drives</td>
<td>$20</td>
</tr>
<tr>
<td>Medical Professionals to Teach Modules***</td>
<td>$0</td>
</tr>
<tr>
<td>Video Recording****</td>
<td>$0</td>
</tr>
<tr>
<td><strong>Total</strong>***</td>
<td>$1620+</td>
</tr>
</tbody>
</table>

*Source: Voltaic Systems n.d.
**If through UW-Madison French Department as a part of the Nonprofit Board Leadership Course.
***Volunteer
****If through UW-Madison Design Lab as a part of the Nonprofit Board Leadership Course.
*****Depending on involvement of UW-Madison through potential project for CSCS 801.
References


Roberg, Kathy. 2019b. In-person discussion with HMMW trip committee chair, 4.5.19.


