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*Gadyen Dlo* "Water Guardian": A Qualitative Study of the Influence of Cholera on Household  
Water Treatment Practices in Haiti

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## Abstract

*Gadyen Dlo* “Water Guardian”: A Qualitative Study of the Influence of Cholera on Household Water

Treatment Practices in Haiti

By Erin S. Garnett

**Background:** Lack of improved water and sanitation were determined to be key factors in the rapid spread of the cholera epidemic in Haiti. Household water treatment is a point-of-use water quality intervention that is being increasingly used in developing countries to address the need for safe drinking water. Deep Springs International (DSI), a US-based NGO operating in Haiti, supervises the local production and distribution of a sodium-hypochlorite water treatment solution *Gadyen Dlo* and a safe storage container and provides community education on the use of household water treatment. The aim of this study was to explore how perceptions of cholera influenced the uptake of HWT in Haiti.

**Methods:** Twelve focus group discussions (FGDs) with HWT program participants were conducted in communities served by DSI’s *Gadyen Dlo* program; 6 in *Gadyen Dlo*’s Jolivert program region, 3 from the North program region and 3 from the Léogâne program region. Topics of discussion included perceptions of cholera and perceptions and behaviors relating to household water treatment methods and practices. Data were analyzed using thematic analysis in MAXQDA version 10 software.

**Results:** Results from this study show that the Haitian community suffers from fear, uncertainty and confusion about the cholera epidemic. Many people attributed the arrival of cholera in Haiti to the government or foreign entities. Fear of cholera emerged as a major motivator for uptake of water treatment in the community. Most FGD participants understood the importance of and correct usage of *Gadyen Dlo* and a few other HWT products. Communities generally liked the taste and quality of the *Gadyen Dlo* product over other products.

**Discussion:** This thesis presents important data about how perceptions of cholera may influence the work of international NGOs and others working in public health in Haiti. The study also presents a conceptual framework to understand ‘change factors’ that influence a person’s movement through the three important stages of the HWT behavior change continuum: *awareness*, *action* and *maintenance*. Findings from this thesis can be utilized by the *Gadyen Dlo* program and other NGOs providing HWT to the Haitian community to improve the planning and implementation of HWT interventions in Haiti.

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## Table of Contents

Chapter 1: Introduction and Project Aims .....	1
1.1 Study Context.....	1
1.2 Deep Springs International (DSI) and Gadyen Dlo .....	1
1.2.1 Gadyen Dlo and SWS.....	2
1.2.2 History and Organization of Deep Springs International .....	3
1.3 Problem Statement and Research Questions .....	4
Chapter 2: Literature Review .....	6
2.1 Household Water Treatment .....	6
2.1.1 Behavior Change Theory Related to Household Water Treatment .....	7
2.1.2 Adherence to Household Water Treatment (HTW) .....	8
2.1.3 Point of Use Water Treatment in Emergency Settings.....	9
2.1.4 Sustained Uptake of Household Water Treatment .....	10
2.2 Cholera and Water Treatment in Haiti .....	15
2.2.1 History of Cholera in Haiti .....	15
2.2.2 Perceptions of Cholera in Haiti .....	16
2.2.3 Water and Sanitation in Haiti .....	17
2.2.4 Water Treatment in Haiti .....	17
2.2.5 Implications of Cholera on Uptake of SWS and Household Chlorination.....	18



2.2.6 A Case Study of Success of Household Chlorination in Haiti .....	19
Chapter 3: Methods.....	21
3.1 Qualitative Methods Overview .....	21
3.2 Study Sites.....	22
3.2.1 Léogâne. ....	22
3.2.2 Jolivert .....	24
3.2.3 North.....	26
3.3 Instrument Development and Field Staff Training .....	28
3.4 Field Work.....	30
3.4.1 Participant Recruitment for Focus Group Discussions.....	30
3.4.2 Focus Group Discussions (FGDs): .....	32
3.5 Data Storage .....	33
3.6 Analysis.....	34
Chapter 4: Results .....	37
4.1 Cholera .....	37
4.1.1 Fear of cholera .....	37
4.1.2 Cholera is dehumanizing .....	44
4.1.3 Where does cholera come from? .....	46
4.1.4 Seasonality of cholera.....	59
4.1.5 Confusion, Disbelief, and Outrage .....	60

4.1.6 Se Toujou La (It is still there).....	64
4.2 Water Treatment.....	65
4.2.1 Treatment Methods or Products .....	65
4.2.2 Water Treatment Behaviors.....	70
4.2.3 Behavior Change .....	72
Chapter 5: Discussion .....	83
5.1 Role of Location.....	83
5.2 Fear, Distrust and Uncertainty .....	84
5.3 Behavior Change .....	88
5.3.1 Conceptual Framework for Household Water Chlorination Behavior Change.....	90
5.3.2 Impact of Distrust and Uncertainty Fueled by Cholera on Self-Efficacy.....	100
5.4 Disaster Response .....	100
5.5 Recommendations .....	101
5.5.1 Recommendations for WASH NGOs working in Haiti .....	101
5.5.2 Recommendations Specific to Gadyen Dlo.....	102
5.6 Limitations .....	103
Chapter 6: Conclusion.....	106
References.....	108
Appendices.....	112
A.1 Appendix 1 Focus Group Discussion Guides -English.....	112

A.2 Appendix 2 Focus Group Discussion Guide-Haitian-Kreyol.....	126
A.3 Appendix 3 In-Depth Interviews .....	138
A.3.1 In-Depth Interview Methods.....	138
A.3.2 In-Depth Interview Discussion Guide-English.....	145
A.3.3 In-Depth Interview Guide-Haitian-Kreyol .....	156

## **List of Tables**

Table 1 Summary of Focus Group Discussion Data Collection by Region .....	32
Table 2 Summary of how FGDs were analyzed by Gadyen Dlo Program Region .....	34
Table 3 Months Focus Groups Reported Cholera was Worst in their Community .....	60

## **List of Figures**

Figure 1 Gadyen Dlo Sodium Hypochlorite Solution and Special Bucket.....	3
Figure 2 PATH’s Safe Water Program Behavior Change Continuum (Wood et. al, 2012).....	8
Figure 3 DSI Program Sites and Household Coverage in Communities Served.....	22
Figure 4: Conceptual Framework for Household Water Chlorination (HWC) Behavior Change in the Time of Cholera in Haiti .....	89

## **Chapter 1: Introduction and Project Aims**

### **1.1 Study Context**

Although access to improved drinking water in Haiti has improved dramatically since 1995 with over 21% of the population gaining access in 15 years (Joint Monitoring Program, 2012), almost 35% of Haitians still lack access to an improved drinking water source (Institut Haïtien de l'Enfance & MEASURE DHS, 2012). This lack of access to improved drinking water is compounded by the fact that over 75% lack improved sanitation (Institut Haïtien de l'Enfance & MEASURE DHS, 2012). In the United Nation's (UN) *Final Report of the Independent Panel of Experts on the Cholera Outbreak in Haiti*, issues surrounding lack of improved water and sanitation were key factors in the rapid spread of the cholera epidemic across Haiti (Lantagne, Cravioto, Lanata, & Nair, n.d.) which in a conservative estimate was responsible for the deaths of about 8,000 individuals between October 2010 and January 2013 (Ministère de la Santé Publique et de la Population [MSPP], 2013).

In Haiti, as in many other developing countries, household water treatment interventions have become increasingly incorporated into public health response to issues regarding access to safe water both in emergency situations and as a midterm solution for areas that are unlikely to have improvements in public water infrastructure in the near future. Many household water treatment technologies exist, but the Centers for Disease Control has widely promoted the Safe Water System (SWS) an intervention with three components: (1) a locally produced sodium-hypochlorite (chlorine) water treatment solution and (2) a safe water storage container (3) behavior change education and communications (Lantagne & Gallo, 2008).

### **1.2 Deep Springs International (DSI) and Gadyen Dlo**

### **1.2.1 Gadyen Dlo and SWS**

The organization Deep Springs International is a US-based 501(c)3 non-profit organization that utilizes a SWS intervention to provide safe water to communities in Haiti. DSI supervises production and distribution of a locally-made sodium-hypochlorite water treatment solution called Gadyen Dlo or “Water Guardian”. The solution is used to treat water in a 5-gallon safe storage bucket known as the Gadyen Dlo “Special Bucket”. The “Special Bucket” comes with a removable lid, tap and written and graphical instructions for correct use of Gadyen Dlo on the back (See Figure 1). The Gadyen Dlo solution is produced by trained Gadyen Dlo technicians from water, salt and electricity with an imported sodium-hypochlorite generator at several production sites in Haiti communities(Lantagne & Gallo, 2008).

The Gadyen Dlo product has a sodium-hypochlorite concentration between 0.5%-2.0% which is much lower than that of regular household bleach which typically has a concentration between 5-6% and is stabilized through the addition of sodium hydroxide to ensure a longer shelf-life and longer-lasting residual protection in water than regular household bleach (Lantagne & Gallo, 2008). It comes in a refillable bottle with a cap that can serve as a measure with written instructions for use on the label (See Figure 1). One capful of Gadyen Dlo solution treats 5-gallons of clear water. If stored correctly in a covered container or in the Gadyen Dlo “Special Bucket” the water remains with protective chlorine residuals for three days, after which Gadyen Dlo participants are encouraged to discard unused water and treat a new bucket.



Figure 1 Gadyen Dlo Sodium Hypochlorite Solution and Special Bucket, Source: (Ritter, 2012a)

### **1.2.2 History and Organization of Deep Springs International**

The non-profit Deep Springs International (DSI) was founded in 2006 and began its work in household water chlorination by absorbing the *Jolivert Safe Water for Families (JSWF)* program which had been operating out of the *Missions of Love* clinic in Jolivert, Nord-Ouest Department<sup>1</sup>. The JSWF program produced a sodium-hypochlorite solution which it distributed to families in the community along with a safe storage bucket (Centers for Disease Control and Prevention, n.d.). After DSI took over the management of JSWF, Gadyen Dlo went through a period of rapid expansion into two more program areas: (1) Léogâne in Ouest department, through a partnership with another NGO *Children's Nutrition Program* and (2) North Department, after taking over management of household water treatment programs for the now-defunct NGO *Kado Dlo* or *Gift of Water* (Ritter, 2012a). The program was forced to rapidly

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<sup>1</sup> Haiti is divided into 10 administrative departments.

bring its programs to scale as part of the disaster response to the earthquake and they now serve over 66,824 families (Ritter, 2013).

### **1.3 Problem Statement and Research Questions**

The NGO Deep Springs International (DSI) supervises the provision of a point of use sodium hypochlorite water treatment solution called Gadyen Dlo or “Water Guardian” along with a safe water storage bucket in Haitian communities. This study focuses on the Gadyen Dlo programs operating in the Nord-Ouest/Artibonite, Nord, and Ouest departments of Haiti which from now on will be referred to as the Jolivert, North and Léogâne programs, respectively. DSI’s headquarters are located in Léogâne, Haiti (Léogane Program, Ouest department) with field offices in Jolivert (Jolivert Program, Nord-Ouest/Artibonite departments) and Milot (North program, North department).

The geographical features, existing infrastructure, program history, and distribution models of the Gadyen Dlo product vary between each of these program sites. In all sites, the Gadyen Dlo program predated the arrival of cholera. While cholera is a country-wide epidemic in Haiti, the extent to which cholera affected the individual communities that Gadyen Dlo served has not been measured.

This study uses qualitative methodology to explore how perceptions of cholera influence household water treatment behaviors in communities within these different program regions. Findings from the study will be used to inform DSI’s program operations and create strategies to increase sales, coverage and uptake of Gadyen Dlo in each program region. The following three research questions will direct the structure, analysis and discussion of qualitative data collected through focus group discussions with Haitian community members.

- 1) What are the perceptions of cholera in the community?
- 2) What are the factors influencing decisions about point of use (POU) household water treatment (HHWT) in a community?
- 3) What role did cholera play in the uptake and use of point of use household water treatment in the community?



## **Chapter 2: Literature Review**

This chapter presents a review of literature relevant to the results and discussion of my study topic. The literature is presented in two distinct sections. The first section provides background to the topic of household water treatment in developing countries. The second section provides an overview of cholera and water and sanitation in Haiti. This section begins with a history of cholera in Haiti and then discusses perceptions of cholera, water and sanitation infrastructure and water treatment usage in Haiti. The section ends with a discussion of the implications of cholera on the uptake of household water treatment and a case study of a successful household water chlorination program in Haiti.

### **2.1 Household Water Treatment**

Point of use (POU) household water treatment (HWT) and specifically household water chlorination (HWC) has been promoted in many developing countries, including Haiti, as a safe strategy to improve drinking water quality. It has been shown to reduce the risk of diarrhea in children under five by 29% to 40% (Arnold & Colford, 2007; Clasen, Schmidt, Rabie, Roberts, & Cairncross, 2007). However, skepticism remains as to whether household water chlorination should be promoted in developing country settings as a diarrhea reduction strategy. Lack of an unbiased outcome measure (currently most HWT studies rely on self-reported diarrheal disease) and the difficulty and expense of implementing rigorous scientific research methodology such as randomized control trials in HWT interventions limit the ability to show long-term health effects of HWT interventions. Several meta-analyses of HWT found a lack of evidence of sustained health benefits for disinfection-only methods such as chlorination, and some researchers caution against its scale-up until further rigorous evidence has determined it to be effective in developing

countries (Arnold & Colford, 2007; Hunter, 2009; Schmidt & Cairncross, 2009). . Despite this criticism, POU household water chlorination (HWC) is used in about 6% of low to medium income households worldwide with the highest prevalence in the Caribbean and South America at 17% (Rosa & Clasen, 2010) and is promoted as a component of the Safe Water System (SWS). The SWS, comprised of a sodium hypochlorite water treatment solution (often locally produced), safe storage container and behavior change communication, was developed as a water quality intervention by the Centers for Disease Control (CDC) and the Pan American Health Organization (PAHO) in response to the South American cholera epidemic in early 1990s(Lantagne & Gallo, 2008). The CDC and partner organizations have implemented SWS in over 30 countries worldwide, and CDC studies have found it to reduce the incidence of diarrheal disease from 22-84% (Lantagne & Gallo, 2008). Although chlorine by-products in drinking water slightly increase bladder and kidney cancer (1 excess case per 100,000 people who drink 2 liters of chlorinated water a day for 70 years), the risk is negligible compared to that of diarrheal disease (Lantagne & Gallo, 2008). Furthermore, chlorine by-products in water treated with sodium hypochlorite solution are consistently below World Health Organization(WHO) guidelines for cancer-causing agents in drinking water (Lantagne & Gallo, 2008).

### **2.1.1 Behavior Change Theory Related to Household Water Treatment**

One of the biggest challenges to implementation of a household chlorination intervention is that HWT interventions require individuals to change their own personal practices surrounding drinking water. Because the success of HWT is dependent upon individual level behavior change, a few researchers have sought to understand implementation of POU water treatment through the application or adaptation of several different theories of behavior change. (Kraemer & Mosler, 2011) use the Prochaska & Diclemente's Transtheoretical Model (TTM) (1998) to identify six levels of water treatment user groups (regular, irregular, late beginners, relapsers,

fluctuators and non-users) in Zimbabwe and recommend using the psychological factors that distinguish these groups to coordinate campaigns to move all users towards the regular user group.

In their study of the uptake of sodium hypochlorite solution WaterGuard in Malawi, (Wood, Foster, & Kols, 2012) use PATH Safe Water Program's Behavior Change Continuum which combines TTM, *diffusion of innovations* (Rogers, 1995), and *consumer purchase decision process* (English, 2010) into a new model of behavior change. In this multistage process potential HWT users move from *awareness* of the need to treat water and the HWT products available to taking *action* by learning how to use and purchase the product to *maintenance* of sustained changes in daily routines that allow for continued use of the product (Figure 2). Many interventions or evaluations of HWT methods have not explicitly documented using theories of behavior change in the past, but (Kraemer & Mosler, 2011) and (Wood et al., 2012) have shown these frameworks to be applicable to POU water treatment. In the face of criticisms by (Hunter, 2009) and (Schmidt & Cairncross, 2009), more theory-driven evidence-based research is necessary to prove that HWT interventions such as household chlorination are a sustainable solution for increasing access to safe drinking water in developing countries.

**Figure 2 PATH's Safe Water Program Behavior Change Continuum (Wood et. al, 2012)**



### **2.1.2 Adherence to Household Water Treatment (HTW)**

The quantitative microbial risk model developed by (Brown & Clasen, 2012) underscores the importance of the sustained behavior change discussed in (Wood et al., 2012)'s Behavior Change Continuum. The (Brown & Clasen, 2012) model suggests that while high levels of adherence to HWT in high risk settings may avert greater than 500 DALYS per 100,000 person-years, even a 10% decrease in adherence could lead to a 96% reduction in predicted health benefits, depending on the dose response function for pathogens in the water. The model shows the precipitous nature in which health benefits can decline if adherence, or “correct, consistent and sustained use”, are not achieved in a HWT intervention (Brown & Clasen, 2012, p. 2).

Unfortunately, adherence by participants is a distinct challenge in the implementation of HWT programs and can be difficult to monitor as it requires frequent data collection. In most quantitative studies it is hard to distinguish sporadic use from either continuous use or disuse of water treatment because the measurement is typically taken at one distinct point in time. Furthermore, it is often not feasible to collect repeated measurements over an extended period of time. Although the evidence for HWT adherence is lacking, a qualitative study of Malawi women revealed that many women treated water seasonally rather than year round (Wood et al., 2012). This suggests inconsistent adherence may be one of the factors contributing to the reduced evidence of long term health benefits in the studies reviewed by (Hunter, 2009; Schmidt & Cairncross, 2009)and (Arnold & Colford, 2007).

### **2.1.3 Point of Use Water Treatment in Emergency Settings**

POU water treatment and safe storage is often used in emergency settings and disaster response. Emergency distribution of POU water treatment in emergency settings had high initial uptake in the distribution of the SWS in Madagascar following an outbreak of cholera and three

cyclones (Dunston et al., 2001) and in the distribution of PUR flocculant-disinfectant following the tropical storm Jeanne in Haiti (Colindres, Jain, Bowen, Mintz, & Domond, 2007).

(Lantagne & Clasen, 2012) argue that high initial uptake is important, it is not a true measure of successful distribution of HWT in emergency settings because it does not address the efficacy of the intervention. They make the argument for using the outcome of “effective use”, a measure that not only considers uptake of POU water treatment but also whether the water treatment technology was appropriate and given to people who were actually at risk. Using this “effective use” criteria, (Lantagne & Clasen, 2012) determined the distribution of Aquatabs and promotion of boiling following the earthquakes in Haiti and Indonesia to be successful(Lantagne & Clasen, 2012). By comparing emergency water treatment responses in Haiti and Indonesia with less successful responses to cholera outbreaks Kenya and Nepal, (Lantagne & Clasen, 2012) were able to identify the following factors that contribute to high effective use in emergency settings: (1)specifically targeting households with contaminated water supplies, (2)providing a POU water treatment option that effectively reduces microbial pathogens, (3)providing it to a population that is already familiar with the product and (4)providing adequate training on correct product use.

#### **2.1.4 Sustained Uptake of Household Water Treatment**

Evidence exists that HWT may work as short-term strategy in acute emergencies, but there is conflicting evidence about its long-term sustainability as a water quality intervention. In a 2010 report, (Lantagne & Clasen, 2010) used case studies of emergency responses in Kenya and Haiti to argue that sustained use of HWT can be achieved after an emergency with the following conditions: (1) a strategy for sustained use is developed at the outset of the response, (2) continued access can be ensured after the emergency, (3) acute HWT options are followed by

more durable and culturally appropriate options during recovery, (4) populations without access to improved sources are targeted, and (5) training and follow-up is provided along with safe storage containers. The authors claim presence of these conditions contributed to the sustained use of chlorine and filters after the earthquake in Haiti and lack of continued product availability after the emergency led to the unsustainable use of PUR and Aquatab in Kenya (Lantagne & Clasen, 2010). However, (Colindres et al., 2007) found a sharp decrease in use of the HWT product PUR after Tropical Storm Jeanne in Haiti from nearly 60% immediately after the storm to about 20% at the time of follow-up.

As previously discussed, critics claim there is a lack of evidence of the sustained health benefits of HWT. Several intervention evaluations with longer term follow-up have either found no long term health benefits from HWT possibly due to a lack of sustained behavior change (Arnold, Arana, Mäusezahl, Hubbard, & Colford, 2009) or over a 50% decrease in the use of household chlorination products 1-6 months after the intervention had ended (Colindres et al., 2007; Wood et al., 2012).

Studies such as that by Colindres provide conflicting information about the appropriateness of HWT or household water chlorination for sustained use from a behavioral perspective. While use of PUR dropped by almost two-thirds following the acute emergency response, the study did find evidence of sustained use as 20% were still using the PUR product at the time of follow-up (Colindres et al., 2007). A study of WaterGuard in Malawi had similar findings, use of the sodium hypochlorite solution decreased following the intervention, but its use was much greater than it had been before the intervention when almost no one used household water chlorination (Wood et al., 2012). Two evaluations in Haiti and Kenya occurring a year or more after the implementation of a HWT intervention showed high percentages of

sustained use of sodium hypochlorite at or above 70% (Harshfield, Lantagne, Turbes, & Null, 2012; Parker et al., 2006) suggesting that perhaps with the appropriate intervention model, sustainable HWT behavior change can be achieved.

### ***(A) Impact of Subsidies and Price on Adoption and Sustainability***

Product subsidies and pricing are additional factors that may affect both short-term use and long-term sustainability of HWT interventions. Many SWS and HWT interventions begin as a free distribution following an emergency or are cost-subsidized by donor organizations leading to questions regarding self-sustainability and uptake of the product after subsidies end.

Although few studies have been conducted on this issue specifically in the context of SWS or HWT in general, a study of the impact of health subsidies on future purchases of public health related merchandise found that people who received higher subsidies on insecticide treated bed nets were more likely to purchase them when offered the product a year later in comparison to those who were offered a higher initial purchase price (Dupas, 2012). (Dupas, 2012) uses her field experiment to present a behavioral model relating to the sustained adoption of free or reduced-price health products after they are no longer subsidized. She argues that in order for a short-term product subsidy to serve as a catalyst for long-term behavior change, the intervention must have certain qualities in regards to its economic impact at the household level and effects on quality of life (Dupas, 2012). Using this model, (Dupas, 2012) suggests that short-term subsidies may not be appropriate for household chlorination or SWS interventions because the economic and health benefits (e.g. increased productivity, diminished health care expenditures, increased disposable income, improved health) are not obvious in a shorter time period and so the immediate negative impacts on quality of life (e.g. bad taste of chlorine, inconvenience of waiting for disinfection, strain on household finances, and reduced disposable

income) take precedence in the behavior-change process. In order for an intervention to successfully transition from the subsidized to unsubsidized provision health products, it must strike a balance between the short and long-term impacts on household economics and quality of life in its potential long-term adopters(Dupas, 2012).

Two studies by (Luby, Mendoza, Keswick, Chiller, & Hoekstra, 2008)and (Wood et al., 2012)seem to support the model presented by (Dupas, 2012) for long-term adoption. (Luby et al., 2008) found that despite large scale social marketing of a flocculant-disinfectant water treatment product, only 5% of the sample population purchased the product after the subsidy ended. This is likely because the short term subsidy did not allow families to grow accustomed to the taste and incorporate water treatment into their daily routines before the subsidies were phased out. (Wood et al., 2012), however, found that longer subsidies or extended free trials can in fact achieve the balance between quality of life and impact on household finances described by (Cohen & Dupas, 2010) by allowing household water consumers to see the health benefits, value of reduced health expenditures and increased productivity, and relevance to their lives as well as grow accustomed to the taste of chlorine. However, this promising finding still does not address the financial sustainability of long-term subsidies of SWS and sodium hypochlorite solution to large populations.

An economic costs study of distribution of the SWS and sodium hypochlorite solution ‘Clorin’ in Zambia attempts to elucidate this issue. Economic calculations determined that if the program continued to expand through the use of social marketing, it could be self-sustaining at an increase of \$0.18 cents per bottle(Banerjee, McFarland, Singh, & Quick, 2007). Although this seems like a negligible amount of money, an increase of that amount would triple the cost of the bottle to consumers (original price \$0.09). Luckily, the study finds that even with subsidies



SWS interventions have a relatively low cost per beneficiary (Banerjee et al., 2007). This suggests that from a financial perspective, SWS interventions can be sustainable even if they require long-term subsidization.

### ***(B) Role of Community Mobilization and Household Visits***

Many papers discuss the importance of promotion tactics of community mobilization, trained Community Health Workers (CHWs) or promoters, and household visits in the uptake of SWS or POU household water chlorination (Chankova, Hatt, & Musange, 2012; Dunston et al., 2001; Mosler, Kraemer, & Johnston, 2013; Ritter, 2008; Wood et al., 2012). In the implementation of a Safe Water System project in Madagascar, Dunston et al. (2001) attributed high adoption to a combination of social marketing and community mobilization. Person-to-person communication and support from social networks were found to be important factors in the uptake of household water chlorination and the SWS in Rwanda, Malawi and Haiti as well (Chankova et al., 2012; Ritter, 2008; Wood et al., 2012).

Several studies provide compelling evidence that household visits by CHWs or promoters are an especially effective tactic in increasing adoption and sustained use of HWT. Ritter (2008) found frequency of household visits to be associated with consistent purchase of sodium hypochlorite in Haiti. Participants in a qualitative study in Malawi discussed household visits by CHWs as being an important factor to deciding to continue to use household chlorination (Wood et al., 2012). Evidence of the importance of household visits in sustained adoption of HWT behaviors was further corroborated by a study of solar disinfection and safe storage intervention in Zimbabwe. In a comparison of different intervention types (including use of memory aids,

household visits, passing information along through social networks<sup>2</sup>, and public announcements through town criers), household visits with trained promoters were found to be the intervention most highly associated with sustained use 6 months after the intervention ended (Mosler et al., 2013). Unfortunately, few studies look critically at promotion techniques used in HWT interventions. More studies such as the one conducted by Mosler et al. (2013) are necessary to study the efficacy of individual and combined promotion tactics in adoption, continued and sustained use of HWT. Similarly, the efficacy of each of these tactics in different cultural and regional contexts should be studied. These findings will be integral to the successful implementation of HWT programs around the world.

## **2.2 Cholera and Water Treatment in Haiti**

### **2.2.1 History of Cholera in Haiti**

The cholera epidemic in Haiti began in October 2010. By January 2013, Haiti's Ministry of Health had reported over 639,610 cholera cases and 7962 cholera deaths with a 1.2% overall case fatality rate (Ministère de la Santé Publique et de la Population [MSPP], 2013). Over half of all reported cases have led to hospitalizations. At the peak of the epidemic, there were 100-150 deaths from cholera per day.

Controversy surrounding the origin of cholera in Haiti has received much attention in the media. In March 2012, the United Nations Special Envoy for Haiti, former U.S. President Bill Clinton, acknowledged that UN peacekeepers were believed to be the source of the cholera outbreak in Haiti (Mosk, 2012). However, as (Grimaud & Legagneur, 2011) describe, unclear communications regarding the progress of this investigation led to distrust and violence in the

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<sup>2</sup> Certain participants received trainings and were told to pass the information along to friends and family.

Haitian community. In the fall of 2012, an independent team of investigators commissioned by the UN found that the start of the cholera epidemic could be linked to the UN Peacekeeping camp in Mirebelais, Haiti (Lantagne et al., n.d.). (Lantagne et al., n.d.) presented their findings diplomatically, saying that the introduction of cholera by UN Peacekeepers was just one of many factors that lead to the cholera epidemic in Haiti and that the cholera outbreak was “not the fault of, or deliberate action of, a group or individual” (p. 4). Despite both President Clinton’s acknowledgement and evidence from multiple studies (Lantagne et al., n.d.; Piarroux, 2011), in February 2013, UN Secretary general Ban Ki-moon refused to accept UN culpability for the epidemic and rejected a legal claim for compensation for damages to cholera victims (Ivers, 2013). It is likely that the confusing media coverage, unclear reporting on the progress of the investigations, and refusal of the UN to take responsibility for the outbreak have augmented distrust of UN Peacekeepers, the government and foreign aid organizations working in Haiti.

### **2.2.2 Perceptions of Cholera in Haiti**

Cholera has been a stigmatizing disease since the end of imperialism when an epidemic in Bengal was equated with filth and barbarism (Hamlin, 2012). Most recently, Hamlin argues that the disease has served to reignite stigma against Haitians who have been historically blamed for the spread of many diseases in the Global South such as HIV/AIDS and Yellow Fever.

Few studies, however, have looked at how cholera is perceived and whether it is a stigmatizing force within the Haitian community itself. The Red Cross published a paper on perceptions of cholera in Haiti after conducting psycho-social group discussions aimed at encouraging uptake of cholera prevention strategies in communities outside of Port-au-Prince, Haiti (Grimaud & Legagneur, 2011). They found that cholera is also a highly feared disease in the Haitian community. This fear, along with conflicting perceptions about the source and causes

of cholera in Haiti has led to stigma, violence, and distrust of the government and foreign aid (Grimaud & Legagneur, 2011). (Grimaud & Legagneur, 2011) postulate that community perceptions regarding the political origin of cholera may be related to reports linking the start of the epidemic to UN peacekeepers from Nepal. (Grimaud & Legagneur, 2011) warn that organizations involved in health messaging should not try to negate or deny misinformation as this may lead to further distrust of governmental or non-governmental aid organizations working in Haiti. Although more studies need to be conducted, it is highly likely that perceptions of cholera in Haiti are complex and have significant public health implications.

### **2.2.3 Water and Sanitation in Haiti**

Haiti has experienced significant advances in access to improved drinking water with 21% of the population gaining access between 1995-2010 (Joint Monitoring Program, 2012). However, many challenges in access and provision of adequate water and sanitation to the Haitian people persist. 35% of Haitians still lack access to an improved source for drinking water and 36% must travel more than 30 minutes to collect their drinking water (Joint Monitoring Program, 2012). Access to improved sanitation has actually fallen over the past 2 decades and currently only 26% of all Haitians have access to improved sanitation (Institut Haïtien de l'Enfance & MEASURE DHS, 2012). The confluence of poor water, sanitation, and hygiene conditions, including contamination of a major river with human waste, contributed to the rapid spread of cholera throughout Haiti (Lantagne et al., n.d.).

### **2.2.4 Water Treatment in Haiti**

Fortunately, water treatment is relatively ubiquitous in Haiti. The majority of Haitians (71%) treat their drinking water with an appropriate method to reduce pathogens (Institut Haïtien de l'Enfance & MEASURE DHS, 2012). The most popular treatment methods used are water purification tablets such as Aquatab (63%) followed by bleach or chlorine (43%). Less than 2%

boil their water and only 1.4% use ceramic filters (Institut Haïtien de l'Enfance & MEASURE DHS, 2012). Other methods that people use include chlorine powder and raket, a plant that acts as a natural flocculent, to treat their water (Colindres et al., 2007).

In Haiti, POU emergency chlorination interventions have been very successful both in short and long-term adoption of HWT. Over 58% of people used PUR, a flocculant-disinfectant powder produced by Proctor & Gamble, to treat their water following an emergency distribution of the product after flooding caused by Tropical Storm Jeanne in 2004 (Colindres et al., 2007). A survey conducted in the months immediately following the 2010 earthquake in Haiti (Feb 14-March 13, 2010) found that Aquatabs distributed by Deep Springs International had a very high confirmed use of 90% in rural regions and 54% in urban settings (Lantagne & Clasen, 2012). Most recently, (Beau De Rochars et al., 2011) found that use of water treatment increased from 30% to 74% in Port-au-Prince ( $p < 0.05$ ) after an emergency distribution of water treatment tablets that was part of the public health response to the cholera outbreak. While the studies above all discuss the high initial adoption of HWT following an emergency, (Lantagne & Clasen, 2010) also found sustained use of household chlorination after the emergency response to the earthquake in 2010, suggesting that in Haiti an emergency distribution of HWT can also lead to long-term behavior change.

### **2.2.5 Implications of Cholera on Uptake of SWS and Household Chlorination**

The lack of improved sanitation in Haiti is especially concerning in regards to the cholera epidemic that began in October of 2010. In the absence of improved sanitation, adherence and continued use of HWT products becomes of increasing importance in the battle against cholera. Although use of water treatment is relatively high in Haiti, it is not universal and little is known about continued or consistent use in the population that reports using a water treatment method.

It is possible that fear of cholera has increased adherence to water treatment in Haiti. Several studies in other contexts have found cholera to be an important motivating factor for health behavior change. In formative research of handwashing behavior, fear of cholera or the idea of cholera as an immediate danger was cited as motivation for increased handwashing practices in Uganda, Senegal, Kenya and Peru (Curtis, Danquah, & Aunger, 2009). Similar responses have been found in behavior change related to HWT. (Dunston et al., 2001) attributed the rapid scale up of PSI's sodium hypochlorite program in Madagascar in part to the fear or threat of the cholera outbreak. Furthermore, (Wood et al., 2012) found that many people felt compelled to treat their water after an outbreak of disease such as cholera even if they were not consistent users. Both (Wood et al., 2012) and (Curtis et al., 2009) emphasize that the behavior change related to cholera seemed to be more related to the immediate threat of danger and may not be an effective motivator for long term behavior change.

Given the recent and controversial introduction of cholera in Haiti, it is possible that perceptions regarding cholera in Haiti are vastly different from those of people in countries where cholera has been endemic for years. Although (Curtis et al., 2009; Dunston et al., 2001); and (Wood et al., 2012) have established fear of cholera to be an important impetus for behavior change in African countries, it is hard to know how or if these findings will apply to Haiti.

#### **2.2.6 A Case Study of Success of Household Chlorination in Haiti**

The Jolivert Safe Water for Families (JSWF) program which is now under the direction of the NGO Deep Springs International (DSI) is an example of successful implementation of SWS in Haiti. JSWF began in September of 2002 as a pilot that enrolled 200 families and has grown to over 14,000 families in 10 years (Centers for Disease Control and Prevention, n.d.; Ritter, 2012a). Two evaluations of the program have found relatively high continued use of the

sodium hypochlorite product Gadyen Dlo for those enrolled in the JSWF program. In a 2007 survey of a random sample of JSWF program participants, (Ritter, 2008) found that 64% of Gadyen Dlo users in the JSWF program (n= 198) had positive chlorine residuals in their drinking water at the time of an unannounced survey measuring adoption. Program records showed that in 77% of unannounced household visits made by JSWF program staff, participants' drinking water tested positive for chlorine residuals (Harshfield et al., 2012). These numbers show sustained use of the SWS method almost 5 years after the program began. In a case-control study of the same program in the summer of 2012, (Harshfield et al., 2012) not only found sustained use of water treatment in those enrolled in the JSWF (79% of participants vs. 32% of controls,  $p < 0.001$ ), but also found sustained health effect in children under 5 years of age. Children in participant households had a 59% reduction in the odds of diarrhea compared to children in control households (OR=0.41,  $p = 0.008$ ). These studies provide strong evidence of the ability of household chlorination and SWS to provide long-term safe water to communities in Haiti.

## **Chapter 3: Methods**

In this chapter I will present the methodology used in the study design, data collection and analysis stages of my research. First, I will present a brief history and overview of each of the three Gadyen Dlo Program Sites where I conducted my research. Then I will talk about the development of qualitative Focus Group Discussion guides, field work, and procedures for data storage and analysis.

### **3.1 Qualitative Methods Overview**

This study employed a qualitative methods approach using Focus Group Discussions (FGDs) to explore community perceptions on POU water treatment in Haitian communities. During our time in the field, we also collected qualitative data from Gadyen Dlo resellers and technicians about perceptions regarding the distribution of the product to the community. The results of these interviews will not be directly presented in this thesis but do serve as context for the discussion. The methodology for In-Depth-Interviews development, data collection and analysis as well as the In-Depth-Interview Guides are presented in an appendix at the end of this thesis as a reference.

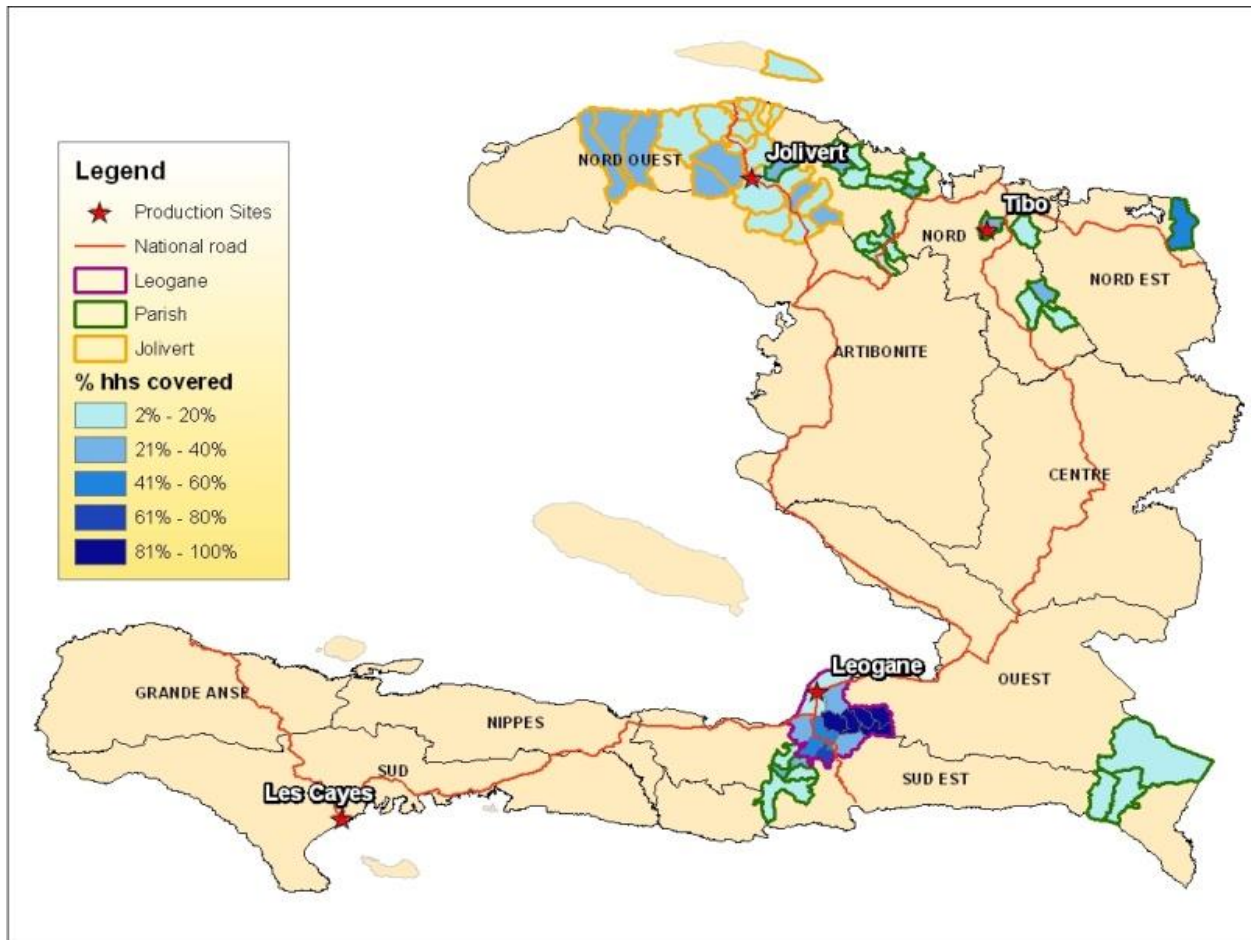
FGDs were used to gain a broad and nuanced understanding of community level perspectives about POU water treatment and how they have changed over time in the specific context of each of the communities. Community members drove the data collection process. This qualitative methodology allowed for findings to arise that were not necessarily anticipated by the researcher or DSI supervisory staff. Qualitative data collection occurred in the Jolivert, North Parish and Léogâne programs between June 6<sup>th</sup>, 2012 and July 19<sup>th</sup>, 2012. During this time, we conducted a total of twelve FGDs with community members.



### 3.2 Study Sites

The study was conducted in communities surrounding DSI's Gadyen Dlo's Léogâne, Jolivert and the North Parish programs (see Figure 3).

**Figure 3 DSI Program Sites and Household Coverage in Communities Served**



**Figure from (Ritter, 2012b)**

#### **3.2.1 Léogâne.**

##### ***(A) Program Site***

Léogâne is a city and commune in the West department of Haiti located about 1 ½-2 hours west of Port-au-Prince. It was the epicenter of the January 2010 earthquake. Many NGOs operated out of Léogâne prior to the earthquake, but the city experienced a proliferation of NGOs

focused on disaster response in the aftermath of the earthquake. At the time of our research in summer of 2012, many NGOs that came as part of the disaster response were starting to leave Léogâne and Haiti.

### ***(B) DSI Program History in Léogâne***

DSI headquarters are located in Léogâne's city center. The Léogâne program began in 2008 when 38 female monitrices (community health workers) from the NGO *Children's Nutrition Program (CNP)* received trainings on conducting household visits and selling sodium hypochlorite water treatment solution. These monitrices received a margin on sales of sodium hypochlorite solution in addition to their compensation for nutrition activities and home visits they already conducted through CNP (Ritter, 2012a). DSI took over management of the water treatment program after the 2010 earthquake, scaling up the program to cover the entirety of the Léogâne commune by training an additional 114 health agents from the local hospital to conduct household visits and sell sodium hypochlorite solution and overseeing the distribution of over 15,000 SWS between February and May of 2010. During this time monitrices and health agents received a \$25/month stipend to train families, conduct home visits and distribute free emergency *Aquatabs*. After the program transitioned entirely over to *Gadyen Dlo* in August 2010, the monitrices and health agents stopped receiving the monthly stipend, but continued to receive the margin on *Gadyen Dlo* sales (Ritter, 2012a). In 2011, DSI decided to select 50 of its distributors to be Community Health Workers (CHWs) and receive a \$31 monthly stipend to conduct monthly home visits to 100 households in addition to selling the *Gadyen Dlo* product. The program instituted quarterly product sales quotas and replaced distributors who did not meet the minimum standards.

### ***(C) Distribution and Coverage in Léogâne***

As of June 2012, DSI had achieved 47% coverage of the Léogâne commune with over 152 distributors of the *Gadyen Dlo* product serving 19,230 families. The program sold 2,635 bottles of *Gadyen Dlo* sodium hypochlorite solution in 2011 and although it increased sales to 5,375 bottles between January 2012 and March 2013, it remained under their target of 6,105 bottles for 2012 (Ritter, 2012b, 2013). CHWs and *Gadyen Dlo* distributors are supervised by 3 Program Supervisors that collect monthly reports from the agents and hold meetings (Ritter, 2012a).

In Léogâne, CHWs, monitrices and distributors typically both sell the *Gadyen Dlo* product and conduct household visits. Although the sales margin received by CHWs, monitrices and other distributors has remained 10 gourdes (gds) or about \$0.24 USD per bottle since the program began as part of CNP in 2008-09, the price per bottle doubled from 25 gds (\$ 0.59 USD) per bottle to 50 gds (\$1.18 USD) per bottle in 2012.

### **3.2.2 Jolivert**

#### ***(A) Program Site***

Jolivert is a small village in the Northwest Department of Haiti. The Jolivert Program serves rural communities across Northwest and some of the Artibonite departments of Haiti. The region is very mountainous with limited infrastructure development. While the area has cellphone reception, few households have a household connection to water. Roads to many communities in the region are often washed out and may become impassible after rains. It often takes hours to travel relatively short distances. This creates a uniquely challenging environment for the DSI program operating out of Jolivert. The program employs a core salaried staff of four individuals, three technicians and one part-time administrator responsible for chlorine production, distributor trainings, promotions, monitoring, etc. Program technicians have

recruited over 44 distributors that sell *Gadyen Dlo* and receive a profit margin off of sales. Two of the technicians conduct regular household visits (Ritter, 2012a).

### ***(B) DSI Program History in Jolivert***

The Jolivert program is DSI's oldest program site. The faith-based NGO *Missions of Love* began production and distribution of the sodium hypochlorite water treatment product *Gadyen Dlo* as part of the *Jolivert Safe Water for Families* (JSWF) program in 2001 and implemented a pilot intervention serving 200 families in the surrounding community (Deep Springs International, 2012a). In 2008, DSI took over operations of the *Missions of Love* JSWF program growing the program to serving over 14,445 families in the Jolivert program region by 2012 (Ritter, 2012b). At the program's outset, technicians conducted 1 household visit per family per month. However, frequency and coverage of visits has decreased due to the expansion of the Jolivert program in the past 10 years with less than half of families receiving a visit in a year (Ritter, 2012a).

### ***(C) Distribution and Coverage in Jolivert***

As of June 2012, *Gadyen Dlo*'s Jolivert program served over 14,445 families with an estimated 27% program coverage in the program region. The Jolivert program sold 14,389 bottles in 2011 but suffered a drastic reduction of sales in the following year, reporting only 5,375 bottles sold between January 2012 and March 2013 (Ritter, 2012a, 2013). It is unclear why this happened, but the extremely high sales numbers in 2011 may have reflected sales to NGOs using *Gadyen Dlo* in emergency distributions of HWT in 2011. The head technician recruits product distributors based on reputation in the community, geography and sales performance. Jolivert distributors occupy a variety of roles in their respective communities from teachers and market vendors to pastors and other community leaders. Many distributors travel to Jolivert to

purchase *Gadyen Dlo* from the production site while others obtain *Gadyen Dlo* from designated wholesale sites where the program technicians deliver chlorine(Ritter, 2012a).

There are three basic distribution models in operation in the Jolivert region. In some areas, typically those closer to the chlorine production site in the village of Jolivert, distributors are recruited to sell the *Gadyen Dlo* product for a profit margin and program technicians conduct household visits, in other areas distributors are encouraged to conduct household visits and sell the product for a profit margin. These distributors receive a small stipend for the number of household visits they conduct per month. Finally there are people who sell the product in their community for a sales margin, and receive a profit margin off of the sales. The resale price is not fixed in Jolivert and varies by distributor and community, but it is suggested that distributors sell the product for a 10 gds (\$0.24 USD) profit margin. The price has increased in the past ten years from a wholesale price of 5 gds (\$0.12 USD) per bottle in 2002-2009, to 10 gds (\$0.24 USD) per bottle in 2009 to its current price of 15 gds (\$0.35 USD) per bottle as of January 2012(Ritter, 2012a). Most distributors buy the bottle for 15 gds and sell it for 25 gds (\$0.59 USD) in their communities. But because families can also buy the bottle for the wholesale price (15 gds) directly from the *Missions of Love* clinic, some distributors who live closer to the product site may sell the product for less money.

### **3.2.3 North**

#### ***(A) Program Site***

The North program site operates primarily in the North Departments with a few communities in the Northeast and West Departments. Like the Jolivert communities, the North was largely unaffected by the 2010 earthquake. Communities in the North, however, are generally more developed than the communities that the Jolivert programs serves. Transportation

is more reliable in the North. Roads are better-maintained and an airport operates out of the city of Cap Haitien which was the former capital city of the island. The North program headquarters are located in the historic town of Milot which is half an hour east of Cap Haitien. In January 2012, the program employed 3 field supervisors, one program coordinator who split time between the North and Léogâne, and 47 full-time water technicians who received a monthly salary to conduct household visits and received a margin on sales of *Gadyen Dlo* (Ritter, 2012a).

### ***(B) DSI Program History in the North***

The North programs began under the direction of the NGO *Kado Dlo* or “*Gift of Water*” which distributed a dual bucket filtration system along with chlorine in communities in the North department of Haiti. The NGO also provided program management through a system where Haitian parishes were sponsored by Catholic churches in the United States. This sponsorship helped to fund salaries of community “water technicians” who received \$100 USD per month to work full-time performing household visits to test the water for chlorine residuals and providing maintenance of the dual bucket filtration system for families enrolled in the *Kado Dlo* program (Ritter, 2012a). In 2009, *Kado Dlo* closed its operations in the North due to an inability to continue funding the project. DSI took over a portion of former *Kado Dlo* sites, working with US parishes and Haitian technicians to expand the programs, provide subsidized *Gadyen Dlo* “special buckets”<sup>3</sup> to more families, and increase sustainability of the project. Forty GOW water technicians were trained to continue household visits and teach families to use *Gadyen Dlo* as the chlorine source for the dual bucket system. Salaries decreased to \$75 per month but technicians

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<sup>3</sup> The *Gadyen Dlo* special bucket is pictured in Figure 1 of the Introduction.

were given the opportunity to make a 10 gd (\$0.24 USD) margin on sales of the *Gadyen Dlo* product (Ritter, 2012a).

### **(C) Distribution and Coverage in the North**

In June 2012, the North program served 16,184 families through its former GOW parish water technicians and had approximately 46% coverage in the areas in which they operated. The program had sold only 163 bottles of *Gadyen Dlo* in 2011, but had a 2012 goal to expand sales to 15,543 bottles through new partnerships and recruitment of community resellers not compensated through the church sponsorship program (Ritter, 2012a). Sales data for 2012 was not available for the North at the time this thesis was written.

When the program was operated by *Kado Dlo*, some water technicians sold Aquatabs<sup>4</sup> for use in the dual bucket filtration system for a small profit margin. Others distributed free Aquatabs that were subsidized by their US partner parish. Currently, Parish water technicians receive \$75 a month to conduct household visits on top of the 10 gds (\$0.24 USD) margin on sales of *Gadyen Dlo*. The sale price of *Gadyen Dlo* in the North was 50 gds in January 2012 (\$1.18 USD)(Ritter, 2012a). In June 2012, DSI had dropped the price of *Gadyen Dlo* to 25 gds (\$0.59 USD). Additionally, the North had started training individuals to act as part-time product resellers who were not compensated for household visits but could make the same 10 gds (\$0.24USD) profit margin off of sales.

### **3.3 Instrument Development and Field Staff Training**

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<sup>4</sup> Aquatabs are a rapidly dissolving POU water disinfection tablet produced by Medentech, a company based out of Ireland. They are often distributed in emergency settings. For more information, please visit [www.aquatabs.com](http://www.aquatabs.com).

I developed the Focus Group Discussion (FGD) guides in Atlanta, Georgia based on discussions with DSI Executive Director Michael Ritter and technical experts from the CDC conducting WASH research in Haiti in the months preceding fieldwork. After arrival in Haiti, the guides were reviewed and revised to include other topics of interest to DSI program supervisors. A bilingual Haitian research assistant translated the guides from English into Haitian-Kreyol. Michael Ritter, the DSI Executive Director, verbally back-translated the guides and inconsistencies were marked and corrected with the assistance of the bilingual Haitian research assistant. The guides were piloted in Jolivert, Haiti and further revised. The Haitian research assistant was integral to refining the guides to be culturally appropriate and convey the intended meaning. We revised the guides using an iterative process throughout data collection to ensure that questions were understood in the way that they were intended and that we were able to explore new ideas that were emerging from the data.

The bilingual Research Assistant conducted all interviews and focus group discussions in Haitian-Kreyol. Prior to field work, I trained the Research Assistant using a he participated in a series of exercises to develop qualitative research skills including active listening, in-depth probing, managing group dynamics, note-taking, and transcribing. I also provided training on ethical considerations in qualitative research and properly obtaining consent. The Research Assistant then conducted two pilot interviews and one pilot focus group under the supervision of the DSI Executive Director who is fluent in Haitian-Kreyol. Then the DSI Executive Director , Research Assistant and I met to review our notes from the pilot focus group, refine the question guides and provide constructive feedback on focus group facilitation skills. The pilot focus group yielded good qualitative data and because the group agreed to participate and be recorded, data from the pilot focus group discussion was included in final analysis.



The Research Assistant and I determined that participants would be more comfortable and the flow of the conversation would be more natural if they were conducted entirely in Haitian-Kreyol. I chose not to be present during FGDs as I thought that my presence as a white American researcher might affect the nature of the discussion. While I travelled with the Research Assistant to all study sites, he conducted all FGDs in the local language of Haitian-Kreyol by himself except in the case of Focus Group Discussion 6 conducted on June 26<sup>th</sup>, 2012 where I was invited by participants to participate in the discussion. Although I remained out of site during all FGD, my presence in the community may still have influenced the participant responses in these cases.

The study received a letter of non-research determination by the Emory IRB, however verbal consent for participation and recording was obtained before each focus group. With the participants' permission, interviews and group discussions were electronically recorded. The Research Assistant conducted the interviews and focus groups and simultaneously took notes on the discussion.

### **3.4 Field Work**

#### **3.4.1 Participant Recruitment for Focus Group Discussions**

Gadyen Dlo supervisors from Jolivert, North Parish and Léogâne programs identified sites for community FGDs. All the sites selected were in communities in which the Gadyen Dlo program currently operates. Supervisors elicited help from Gadyen Dlo agents, resellers and technicians in those communities to recruit between 6-10 participants for each Focus Group. Gadyen Dlo agents, resellers and technicians were instructed to recruit people who made decisions regarding household water and had the authority to purchase HWT products. FGD

participants were not provided with any incentives to participate. Snacks and drinks were provided to all participants during the FGD.

### ***(A) Jolivert Program Region***

In the Jolivert region, Program Supervisors selected six communities to get a range of urban (Basanblu, Port-de-Paix, and Tibo) and rural localities (Jolivert, Labutik, and Grivot) that were different distances from the Jolivert program offices at the Missions of Love (MOL) clinic. FGD participants were recruited from families that were part of the Gadyen Dlo program and had received a bucket or purchased Gadyen Dlo water treatment solution in the past year. FGD participants in Port-de-Paix were given a small travel stipend to cover the cost of a moto taxi to the location of the FGD in the city. FGDs in Jolivert Program communities were conducted from June 6-26<sup>th</sup>, 2012.

### ***(B) North Program Region***

North Program Supervisors selected two communities where Gadyen Dlo technicians had started selling the sodium hypochlorite solution (Balambi and Tibo) and one where Gadyen Dlo technicians had not yet started selling the sodium hypochlorite solution (Ferrier). FGD participants from the North programs were recruited from families that were currently part of the Gadyen Dlo program, had either a *Kado Dlo* dual bucket filtration system or a Gadyen Dlo special bucket and had received or purchased Gadyen Dlo water treatment solution in the past year. FGDs in North Program communities were conducted from June 27-July 10<sup>th</sup>, 2012.

### ***(C) Léogâne Program Region***

Program Supervisors in Léogâne chose three communities to get a mix of areas with high sales (Section 3 and Section 11) and lower sales (Section 12). In the Léogâne communities,

Gadyen Dlo Supervisors requested that their agents recruit a mix of people who used or did not use the Gadyen Dlo water treatment solution in their community. FGDs in Léogâne communities were conducted from July 17-19<sup>th</sup>, 2012.

**Table 1 Summary of Focus Group Discussion Data Collection by Region**

Program	Collection Dates	Focus Group Discussions
Jolivert	June 12- 26, 2012	6 FGDs w/ participants who were <i>Gadyen Dlo</i> users in 3 Rural & 3 Urban communities
North Parish	June 27-July 10, 2012	3 FGDs w/ participants in 2 communities where technicians sold <i>Gadyen Dlo</i> & 1 where they had not started selling
Léogâne	July 17-19, 2012	3 FGDs w/ community members that used and did not use <i>Gadyen Dlo</i> in 2 high selling and 1 low selling district

### **3.4.2 Focus Group Discussions (FGDs):**

Focus Group Discussion guides were developed to gain insight into community level perceptions surrounding POU water treatment in each locality. The FGD guide encouraged discussion on the following topics: how cholera has changed perceptions of POU water treatment in the community; specific methods of water treatment used in the community; the decision-making process surrounding choice of method; motivating factors for use; barriers to uptake in the community; and perceptions of the Gadyen Dlo brand in particular. The FGD guide also incorporated to activities into the discussion: (1) a community timeline activity that served as a warm-up for the primary discussion and as a time reference for questions surrounding cholera

and (2) a sorting and ranking activity that utilized pictures of water treatment products to facilitate discussions of various POU water treatment products or methods available.

FGDs took place both indoors and outdoors in communal locations such as churches or schools as well as at private residences. Gadyen Dlo program supervisors asked local resellers, agents or technicians to find an appropriate space that offered privacy and few disruptions. Chairs or benches were provided to participants and arranged in a circular manner to facilitate discussion. Drinks and snacks were provided during the discussion. FGD participants did not receive any additional incentives to participate. All FGD discussion participants agreed to be recorded with the exception of the last FGD in the 3<sup>rd</sup> section of Léogâne. Notes taken by the facilitator during this session were used for the analysis.

After each FGD, the Investigator and Research Assistant met to review the interview notes in English. Notes taken during these meetings were used to inform revision of the FGD guide, identify new themes or topics of interest and as supplemental data to transcriptions. In an effort to reduce cost and save time, the bilingual Haitian Research Assistant and I worked together to translate the Kreyol audio recordings from 5 FGDs into written English. The Research Assistant listened to the recording and verbally translated the discussion into English and I typed his verbal translation. The remaining six recorded FGDs were transcribed verbatim in Haitian-Kreyol from the electronic recordings by the Bilingual Research Assistant and not translated into English.

### **3.5 Data Storage**

All data were stored in a password protected file on a laptop and backed up into two locations: a password protected flash drive and a password protected virtual drive on the Emory

University network. All names and identifying information were removed from FGDs transcriptions.

### 3.6 Analysis

For this thesis, data from the all recorded FGDs were formally analyzed using thematic analysis. The Section 11 Focus Group in Léogâne was excluded from the analysis because that group declined to be recorded. As previously mentioned IDIs were not formally analyzed for the purposes of this thesis, but may have been used to informally provide context for FGDs. Five FGDs were analyzed in English, and the rest were analyzed in the original Haitian-Kreyol because no funds were available to translate them into English. Please see table below:

**Table 2 Summary of how FGDs were analyzed by Gadyen Dlo Program Region**

<b>Gadyen Dlo Program Region</b>	<b>FGDs Analyzed in English</b>	<b>FGDs Analyzed in Haitian-Kreyol</b>	<b>FGDs not analyzed (no recording)</b>
Jolivert Region	Jolivert, Labutik, Grivot, Basanblu, Boden	Port-de-Paix	
North Region		Balambi, Tibo, Ferrier	
Léogâne		Section 12, Section 3	Section 11

Data analysis was performed using MaxQDA version 10, (Verbi GMBH, Marburg, Germany). First, FGD guides were reviewed to identify deductive codes that corresponded to themes solicited by questions on the FGD guide. Then, 1/3 of the original focus group data was reviewed for inductive code development. The three rural (Jolivert, Labutik and Grivot) and one urban (Basanblu) FGD from communities in Jolivert were closely read and annotated to establish inductive codes that represented novel or interesting themes that were not explicitly prompted in the guide. The three rural FGDs were also selected because they represented two distinct types of rural areas: those along a major route or roadway (Jolivert and Labutik) and

those in the mountains with even less accessibility (Grivot). Additionally, several functional codes were applied to the text to easily identify certain sections of the FGD where the guide prompted participants to discuss water treatment *before cholera, during cholera* and *today*.

After codes were applied to the first four FGDs, the FGDs from the rest of the urban Jolivert communities (Boden and Port-de-Paix) were read and annotated. Several code definitions were modified to either broaden or narrow their application. A few codes that had not been applied very often or were determined to be too similar to other codes were combined or established as subcodes. The same process was repeated with the remaining focus groups. The iterative process of code development resulted in 31 primary codes.

During the analysis, the data was divided into two main components: data which pertained to *perceptions of cholera* and data which pertained to *household water treatment*. Sections of the text were retrieved using different codes and combinations of codes that described cholera and household water treatment. The retrieved text was re-read in search of common patterns across focus groups. If an idea emerged across the majority of focus groups, it was identified as a theme and broadly described in an annotation. Then the text relating to that theme was segmented again and FGDs from rural Jolivert communities, urban Jolivert communities, the North and Léogâne were compared for variations in the ways the themes were described by participants in each region. Comparisons were also made between sections of the transcriptions corresponding to *before cholera, during cholera* or *today*. Topics that were consistently repeated across all FGD were considered to have reached saturation when no new variation in response emerged.

Finally, the participants' own words were used to ground the research findings back in the data. Textual data was searched for quotes which exemplified the way a topic was "typically

described” in the data. Some quotes representing important variations in the data were also identified for inclusion in the results section. For the purposes of reporting results, I translated quotes that were selected from Haitian-Kreyol data into English before presenting them in the analysis section. The languages in which each of the FGD transcripts were analyzed are presented in Table 2 above.

## Chapter 4: Results<sup>5</sup>

### 4.1 Cholera

#### 4.1.1 Fear of cholera

Cholera is a reality for communities in each of the three regions where we conducted Focus Group Discussions (FGDs). Each discussion began with a community timeline activity in which groups were asked to name the important events that in occurred in their community from the time of the January 2010 earthquake until the present day (Summer 2012). Most groups, with the exception of the group in the small city of Basanblu in Jolivert, named cholera very early on in the discussion with little probing.

People in all three program regions were very familiar with the disease. Only one focus group, Léogâne's Section 12, said that cholera had not yet arrived in their community. But even they were keenly aware that it was just around the corner. All groups knew the physical manifestations of the disease and the rapidity with which it can kill its victims. Several terms were used to refer to cholera in the FGDs, *kolera* (cholera), *maladi a* (the sickness), *toro a* (the bull), and the *evenman* (the event).

Community members equated cholera with the “death and suffering” of *anpil*, *anpil moun* (“many, many people”) both in and outside of their communities. Even the remote communities in rural Jolivert knew that cholera was a nationwide epidemic. Several communities in each of the three regions discussed knowing that it had been worse in other communities. According to

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<sup>5</sup> In this section, quotes begin with the FGD participant number or letter of the person speaking. Each quote is labeled with the FGD village name and paragraph number in parentheses.



two participants in Jolivert, not only was the destruction of cholera not particular to their community, but they perceived it to be less severe than the cholera they experienced in other communities:

*P2: Cholera is everywhere right now. Cholera was not as bad as it was in other places because it did not kill a lot of people.*

*P3: There are some people dead but it isn't a large number. (Jolivert, 246-237)*

Images of cholera in the community pervaded each discussion. The symptoms are severe, “you cannot walk. You cannot stand to talk. You are dizzy...” (Grivot, 552-553) and you experience forceful vomiting and diarrhea that rapidly rid your body of all of its water and bring you close to death (Balenbe). It is a disease that makes a lasting visual impression on the community. People talked about seeing cholera victims dying in the street or being carried in stretchers. For example, one participant described a trip to a nearby town:

*P2: I was going to Chansòl and when I walked in the streets there was a woman who had cholera. I didn't see the woman and someone yelled someone had cholera. And she was almost dead. (Jolivert, 205)*

*P?: They fell from time to time. You can see that they bring two people and then the next time you see them bring another two people. You can be standing there and you see people running and you ask them what's happening and they say, 'Cholera'. (Grivot, 35-40)*

In the North, participants talked less about people dying in the streets and more about cholera's impact on the body. For example, in the Balenbe FGD in the North a participant described it in the following manner:

*P4: As long as you have diarrhea, the water will be diminishing in your body, there won't be any more water to support your body...and after cholera has taken a man, it leaves the body stiff, sick all over, the sewom [ORS or IV], you can't bear it. (Balenbe, 57)*

In the FGDs conducted in rural villages in the Jolivert region, participants described a greater number of direct experiences of cholera. Two people, one from a rural focus group and one from the urban focus group of Boden in the Jolivert program region, were cholera survivors. One participant recalled being so sick she lost consciousness. Her sickness not only affected her physically, but caused herself, her family and her community a great deal of stress. She described the response from her family and community thusly,

*P2: I just started vomiting and then suddenly I was unconscious. The cholera knocked me over the head. When I regained consciousness, I saw I was sitting on a bucket... They'd already called people in the USA and told them I was sick. Mezanmi!<sup>6</sup> It was really hard. People were calling me all the time.” (Boden, 103)*

While cholera had an effect on all communities, each community experienced cholera in a different way. Some FGDs had more personal stories to tell than others. Several FGDs (Basanblu and Port-de-Paix in urban Jolivert, Tibo or Ferrier in the North, Lèogâne's 12th section) did not discuss having any close personal contacts who had gotten, while other groups were filled with stories about family members or neighbors who contracted cholera. Rural Jolivert communities

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<sup>6</sup> Literally, “My friends!” An Kreyol interjection that can mean, “My Goodness!”

were hit especially hard. Everyone in the Labutik FGD, for instance, had a family member who had suffered or died from cholera. Several people in the Grivot group also lost family members.

*Yes, I'm still worried. I had two people die from cholera. I almost lost a young girl in family to cholera. (Grivot, 67)*

Many people in Gadyen Dlo program communities were either personally affected or knew people affected by the disease; they felt strongly aware of the proximity of cholera.

***(A) Te touye anpil moun e pa repò (It killed many people and never rests):***

According to community perceptions, cholera's outcome is death. The inductive theme of cholera "*te touye anpil moun e pa repò* (it killed many people and never rests)" (Balenbe, 29) reached saturation pretty early on in the Analysis. Although a few participants shared stories about how they themselves or members of their families contracted cholera and recovered, recovery is an aberration from the norm. Cholera was described as a voracious killer that takes out all people in its path: "In a house where the people had cholera, three or four people would die at once" (Grivot, 51, P?) and "cholera, when it passes it takes everybody" (Balenbe, 58, P5). Another Grivot participant described how nearly everyone who did not treat their water died from cholera. In the urban Jolivert community of Boden, outside of Port-de-Paix, cholera was described as a sickness that is *pa dous*, an expression which literally means "it is not sweet" but contextually means "it is no joke," and is not something to be taken lightly.

Most communities knew that cholera could be treated at a hospital, a Cholera Treatment Center (CTC) or with Oral Rehydration Salts (ORS) or *sewom* as it is called in Haiti. But, they also viewed recovery as an ideal outcome that is far from guaranteed. Participants from the Jolivert and North program regions shared a sense that death was inevitable for a person who

contracted cholera. Despite having several cholera survivors in their communities, participants in the Jolivert program region (Urban and Rural) talked about this inevitability of death and also expressed a feeling that even if you were able to make it to a hospital on time (which was far from guaranteed), cholera survival was only due to chance. In the North, this feeling was presented from a more religious point of view, that it is only by the “grace of god” that a person could survive the sickness.

*P?: If cholera gets you , you die. (Grivot, 553)*

*P1: Like when somebody gets sick from it, when they run with the person, there is a chance he can be successful and revive or he can die and he can spend 15 to 20 days in the hospital. He may revive and he may die. It depends on his chances.*

*(Boden, 64)*

This theme of the inevitability of death was complemented by descriptions of the rapidity with which cholera kills its victims. Participants discussed how quickly it passes through the community, “after it takes you, another falls, it takes another” (Balenbe, 76) and how rapidly it can develop in the body, killing people before they have time to seek help.

*P?: In a little amount of time, it [cholera] can send you to the cemetery. You see the person in front of you dying [from cholera] and you cannot do anything for him.” (Tibo, 59)*

*P4: There was someone who had it during the night. When we woke up in the morning, he had died. Cholera killed him. (Jolivert, 77) P2: What really makes*

*your heart jump, for example, is that in the same place cholera takes you, if you don't have somebody around, I believe you will even die. (Balambi, 11)*

Access to doctors and medical treatment did factor into the discussion of the rapid onset of the disease, but anecdotally cholera outcomes were not perceived to be less severe based on where you lived. People in the mountain town of Grivot talked about people dying in the hours that it took to travel to the nearest hospital where they could access treatment. Even in places with greater access to hospitals, clinics or treatment centers, community members still perceived survival as being up to chance. These groups discussed people dying in the night because they did not get treatment soon enough or dying because there were no family, friends, or neighbors around to help them when they got sick.

### ***(B) Fear and behavior change***

Fear of cholera was pervasive in all FGDs. People said cholera caused them to experience *kè sote* (“jumping heart”). Participants from all FGDs perceived their communities to be at risk for cholera even if, as in the case of Léogâne Section 12, their community had still not been directly affected by cholera. Participants recognized that cholera is much worse for children, who do not have the same strength as adults, and those who are hungry because they do not have enough food to eat, but still perceived themselves to be so susceptible that even a “drop of unclean water” (Boden, 49, P3) can give them cholera.

People were also afraid of contracting cholera from those who had it and were therefore fearful to go to hospitals (Boden, 101-102) or to take care of those who had cholera:

*P4: It enters into a house and takes everybody, there isn't a person who can care for you, if you go care for them, it will also take you...*

*P5: You cannot have it not take you. (Balenbe, 64-65)*

Fear surrounding cholera caused paranoia and panic. One focus group participant said that her son got diarrhea and she ran to the clinic with him terrified that he had cholera only to find out that he did not. Other participants described people running to get free distributions of water treatment products even if they had not previously used them because they were so terrified of cholera. In Boden, a participant whose husband sold the Gadyen Dlo product out of their house described a similar phenomenon in her community. She described how her neighbors and people who'd heard they had the product converged on her house in a panic:

*P3: Everyone was running around and saying 'Don't you have something to give me to treat my water? Mezanmi, can't you give me a little bit to treat my water?' They said we had it here. Some people came with little bottles so we could put a little in it so they could go back to treat their water. Everybody was running to go ask for water treatment. They were crazy. (Boden, 238)*

Fear of cholera inspired many to seek out and start using water treatment and change other daily behaviors. Each community talked about many ways that they could prevent themselves from getting cholera including water treatment, handwashing, cooking food well, washing fruits and vegetables in treated water, not practicing open defecation, covering food and water, and keeping a clean house and yard. In the urban communities served by the Jolivert program, people discussed avoiding water, candies and other refreshments sold by street vendors.

Participants from the Boden FGD discussed avoiding fish and one participant even described people who were fearful to eat any food at all:

*P1: That's why when cholera arrived, a lot of people lost weight. The food that you had to eat, you could not eat them. (Boden, 474)*

In several focus groups, participants discussed fearing to touch or shake hands with others because cholera could be spread from close contact. In the North, some towns decided to cancel their Saint's Day festivals because they feared cholera would spread.

Interestingly, using water treatment helped a few people feel less fearful of getting cholera but this was not true for most participants. One participant in rural Jolivert program region confidently related that she was protected from cholera:

*P?: I'm a participant in the treated water, by the grace of god I'm not afraid anymore. My heart is not jumping ("kè sote") anymore. (Grivot, 75)*

Yet many participants doubted the ability of water treatment to protect them from cholera. The woman in Jolivert that contracted cholera stated that she used water treatment and still got cholera. A fellow Jolivert participant doubted that water treatment could protect a person from cholera because she had seen others that always used water treatment and washed their hands and still got cholera. One participant shared a story about a woman who was so committed to water treatment that even her dogs drank treated water and she too contracted cholera.

#### **4.1.2 Cholera is dehumanizing**

Cholera impacted many facets of life, including how people were able to care for their dead. When asked whether they were still worried about cholera in their communities, many people in the Jolivert program region started discussing the disposal of the bodies of cholera victims. In Jolivert, one participant discussed cholera victims that were buried in plastic and not returned to their families. They described people being buried right where they died, “they just dig a hole and bury you there” (Jolivert, 238). One participant witnessed a woman who died on the road on her way to the hospital for treatment:

*P2: They started to take her to the hospital but she died and they buried her on the road. The woman who died’s family was there and they just buried her on the road. Her son was crying. They just buried her on the road. (Jolivert, 205)*

Basanblu participants described the dehumanizing way in which cholera victims are buried, “P1: Sometimes the person dies, and they bury the person like an animal...you don’t need to bring the coffins.” (Basanblu, 81) The topic was clearly an uncomfortable one for community members and it was clear from the discussions that many people did not know how to react or think about the situation. One participant laughed inappropriately at another’s story of not being able to bury his relative. The discussion progressed as follows:

*P1: As they told me, don’t take the sick person home, I left him in the hospital. But the way they buried him, they didn’t give me time even to make a coffin...*

*P5: [loud laugh]*

*P4: It is like they just throw the person in the hole. (Basanblu, 86-88)*



The dehumanizing burial of cholera victims was not brought up in the other discussions, but the community in Grivot talked about another dehumanizing practice that occurred after a person died in their community. Some people also talked about prevention messages about maintaining a safe distance from people and not shaking hands or hugging. They described how the pastor came with some men and sprayed the houses of people who had died with disinfectant. It was unclear whether these practices only occurred in communities near the Jolivert program headquarters (Jolivert , Grivot & Basanblu) or whether participants in other FGDs did not talk about it because it was too upsetting and difficult to discuss.

#### **4.1.3 Where does cholera come from?**

The question of “Where cholera comes from” typically yielded two types of responses: (1) *Origins*: how it came to arrive in Haiti and (2) *Causes*: the specific reasons or ways that a person contracts cholera. This question was not specifically asked in the focus group guides and so the data presented here arose from the participants themselves. Theories about how cholera came to Haiti were only discussed by focus groups in the Jolivert program region. The Léogâne and North regions only discussed how people contracted cholera and made no suppositions about its arrival in their country or community. First, I will describe the components of the discussion surrounding how cholera came to Haiti and then I will describe perceptions about how an individual contracts cholera.

##### **(A) Origin of cholera:**

There was a lot of confusion in communities across all Gadyen Dlo program regions about the origins of cholera in Haiti. Although explanations or ideas about how cholera came to arrive in Haiti varied from community to community, most communities were aware that it was a sickness that was new to Haiti. There are four main ideas that exist about cholera’s origins: (1)

“The Cholera Helicopters“, (2) Cholera is political, (3) Faraway Lands, (4) Witchcraft/the Supernatural. Some of these themes only appeared in focus group discussions in certain program regions and it is unclear whether these ideas hold relevance outside of the communities where they were expressed. These ideas did not reach saturation in the data, and so it is unclear whether further data collection would result in a greater variety of information or in confirmation of the specific beliefs expressed here.

### (1) “The Cholera Helicopters”

Participants in the rural community of Labutik and the urban community of Boden in the Jolivert program region both discussed the “The Cholera Helicopter” theory, or the idea that helicopters bringing cholera flew over their communities in the night. While both groups expressed some doubt about the reality of the cholera helicopters’ existence, they also explained that this was something that people talked about in the community. Below I present Labutik’s version of the story:

*P3: They always make us afraid at night time. Anytime that a helicopter comes flying over they say that they’ve [the helicopter] come to sprinkle the cholera powder and so all the people run inside their houses.*

*P2: Could they really have done that?...*

*Research Assistant [RA]: Did people tell you about the helicopters or have you seen them?*

*P5: I used to hear about it from other people, but I haven’t seen the helicopters.*

*P5: They always fly through the community, but we’ve never seen them.*

*P3: We never actually saw the helicopter.*

*P4: I don't really believe it.*

*P2: I don't really either. (Labutik, 420-431)*

Although they doubted the story, they hesitated to completely reject it saying instead that they “don't really believe” it to be true. None of the group members claimed to have seen the helicopters or to know people who saw them.

Boden's version of the story did not involve the sprinkling of a “cholera powder”, however, like in Labutik, it connected cholera to helicopters that passed overhead in the night. The Boden FGD was also not completely sure what to think of these stories. The group members laughed, but then one participant admitted that the story used to scare her.

*P3: At 2 am in the morning everybody gets cholera [everybody laughs]. There were two airplanes that flew over.*

*P2: It was two helicopters.*

*P3: There were two helicopters that flew over and at 4 am everybody had cholera.*

*P1: They used to make me scared about it. (Boden, 114-117)*

## **(2) Cholera is political.**

The helicopter story is also related to another theme that came up in our focus group discussions in the Jolivert program region about cholera's origin, the theme “cholera is political” or “kolera se politik”. This theme described community perceptions that cholera was purposefully brought to Haiti by some unknown power or foreign entity.

The idea that the arrival of cholera was somehow political was interwoven into the cholera helicopter story told in Boden and into an explanation of perceptions of cholera given by a man in the Basanblu focus group. In Boden and Basanblu it was explicitly stated in the discussion. A man in the Basanblu FGD simply stated “cholera is ‘politik’” (Basanblu, 70, PM), while the Boden participants went into a bit more detail:

*P3: Some say cholera is a ‘politik’<sup>7</sup>.*

*P4: There are some people who believe it is superstition.*

*P3: They say cholera is a ‘politik’....*

*P2: Some people said that cholera came from Santo Domingo [Dominican Republic]. (Boden, 112-114)*

In some instances the political association was more implicit and contextual. For instance, both *Santo Domingo*, which is located in the Dominican Republic, and “white people“ were mentioned in discussions on the source of cholera in the Labutik and Boden FGDs. In Boden, participant five stated, “some people said that cholera came from Santo Domingo” (Boden, 118). This statement may have carried added meaning given the historical tension between Haiti and the Dominican Republic. In Labutik, the theme of “cholera is political” was implied by the discussion turning suddenly to “white people” after two people expressed the improbability of

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<sup>7</sup> In our simultaneous translation of the text from the Boden focus group discussions, my Haitian Research Assistant suggested that I keep the Haitian term “politik” because it could be interpreted in a few different ways, in both the literal sense “political” but also as “something that was not true”.

the cholera helicopters, “The white people, even if they don’t have the same skin like me, they are human beings like me” (Labutik, 418-419, P5). In the way that this discussion unfolded, it became clear that many community members believed that white people were the operators of the helicopters or at least involved in their deployment. The previous quote shows Participant 5 attempting to understand the complicated relationship that Haiti has with ‘white people’. Her defense of white people’s humanity was a response to the community’s underlying assumption that not only were white people somehow involved in the arrival of cholera but they may have brought it on purpose.

This underlying distrust and blame was extended to NGOs, and Gadyen Dlo specifically, in the Boden focus group. Participant three stated, “And also you can’t accuse the program and say it is their fault if you get sick from cholera. If you are drinking Gadyen Dlo and you get sick from cholera, maybe it is because you don’t respect the rules.” By defending Gadyen Dlo she was illuminating a community perception that Gadyen Dlo was somehow culpable when people got sick from cholera. It is possible that this culpability may be more related to the quality of the product rather than the arrival of cholera, but it is still important to consider. The community may not think Gadyen Dlo is responsible for the arrival of cholera in the community, but they might believe that if they get sick it is because Gadyen Dlo’s water treatment product somehow failed to protect them.

As we discussed earlier, participants in several FGDs shared stories about people who always treated their water (presumably with Gadyen Dlo because FGD participants were also Gadyen Dlo program participants) and still got sick from cholera. Most of them just expressed confusion about how this could happen, but for some of them this translated into a disbelief of messages about how cholera was spread or how it could be prevented. Here we also see this

confusion translated both into doubt of a particular individual's ability to correctly use the product and follow prevention messages and doubt in the Gadyen Dlo product itself. In Participant 3's story, the individuals who get sick doubt the product and she in turn doubts them, suggesting that they do not follow basic prevention rules.

### **(3) Far-away land:**

Two focus groups from the Jolivert program region expressed related ideas about how cholera had arrived in their respective communities. The village of Jolivert FGD talked about how cholera had come from the neighboring Artibonite region of Haiti and the Boden FGD discussed the community perception that cholera came from the UN peacekeeping force MINUSTAH. Other groups from both the Jolivert and North program regions did not talk about the specific path of cholera through the country into their specific communities, but they did express the idea, like Boden, that cholera's arrival to the country was somehow connected to a far-away land. Participant three in Labutik said, "Some say that the sickness came from *far* away...cholera is affecting Haiti now, but they told us that cholera was in other faraway places" (Labutik, 415-420, P3). Participants from Balambi in the North program region knew that cholera had existed in other countries for many years and this made them worry about Haiti's future, "in organized countries it has been there for year and for us who are not organized?" (Balambi, 54, P5). Another participant stated "in other countries they usually give out vaccines for those things [cholera]" (Balambi, 55, P2), again recognizing that Haiti was not the first country to suffer from cholera.

This idea that cholera came from a far-away land was challenged by a participant in Léogâne section 12 who stated that "cholera is not a thing that came just like that" (Section 12, 187, P6). It was unclear by the rest of his statement whether he denied that cholera existed or didn't believe

that it came into the country ‘naturally’. Many FGDs described people in their communities who did not believe in cholera even though it was killing people around them. Typically those within the FGDs thought that the people who do not believe in cholera were foolish. But because Participant 6’s comment came after such a discussion, it seems like he might also doubt its existence.

#### **(4) Witchcraft/the Supernatural**

Witchcraft/the Supernatural serves as a natural transition from the *origins* of cholera (how cholera arrived in Haiti) to the *causes* of cholera (reasons people contract cholera) because witchcraft/the supernatural could be viewed as either one depending upon the interpretation. Community perceptions about the possible supernatural origins of cholera were only explicitly described in the Boden focus group in the Jolivert region. Participant three talked about community members who were suspicious, “They...also say that cholera has *makanda* [witchcraft] in it and that is killing the people” (Boden, 56). Makanda is related to religion and culture of *Vodou*. It is important to note that *Vodou* can be a taboo subject in Haiti, especially in Christian-dominated communities. Lack of further discussion about cholera’s possible relationship to the supernatural may be related to this taboo.

#### **(B) Causes of Cholera**

In the previous section, we discussed community perceptions surrounding the arrival of cholera in Haiti and in their communities. In the following section, we will discuss how the community members understood what causes cholera to develop in humans. Explanations of the specific cause of cholera in humans ranged from the supernatural, mentioned as well in the previous section, to water, microbes and poor sanitation. Much confusion remained in the community about the true reason people contracted cholera. Some community members said that

they did not understand why cholera makes people sick or how it came to their country. Others expressed a disbelief that “anything could cause” a person to become sick from cholera. Implications of these beliefs on use of water treatment and/or cholera prevention will be expanded upon in the Discussion Section of this thesis.

### **(1) Supernatural**

The idea that cholera may be caused by the supernatural was mainly implied in the discussion by denial that it could have come from natural causes like water or microbes. But as mentioned earlier, Boden Participant 3 talked about “makanda” or witchcraft being responsible for making people sick. Witchcraft could have summoned cholera to Haiti in general. But, if someone gave another person cholera through the use of witchcraft, it could also be considered the specific reason (or *cause*) a person got cholera.

### **(2) Water**

Water came up a lot in the discussions surrounding cholera. In Boden, people started to get sick and die from cholera after rains in the mountains turned their piped drinking water red. Many communities described people getting sick from drinking untreated water or not using treated water to wash and prepare their meals.

Most participants, regardless of where they lived, had heard messages that cholera came from the water and that to prevent it, you needed to treat your water: “It is a microbe that really wreaks havoc, it is in the water it is, and we can catch it”(Port-de-Paix, 64, P5). These messages had different effects on community member’s perceptions regarding the risks associated with drinking untreated water. For example, participants in small rural mountain village of Grivot (Jolivert program region) believed the risk of contracting cholera by drinking untreated water to



be very high. One participant said, “All of these people who didn’t use water treatment, they were affected. They died from cholera. They were neglectful, they didn’t go to any hospitals” (Grivot, 22).

Participants in Boden and Léogâne, however, talked about how some people believed “it isn’t water that gave the cholera” (Boden, 104). Those who doubted that cholera came from water argued that people have always had the same water to drink and that it has always been safe, so it does not make sense that it would not be safe to drink now.

*P1: Ever since I was a child, I always drank the water. I’m 50 or 60 now and I’ve never gotten anything. They say the water is not the main reason you get cholera.*  
(Boden, 110)

*P6: Water does not have anything in it. Water, since long ago, they used it like that [without treating water]. They never got anything. Water cannot affect people like that. They say that it isn’t water that gives [people] cholera. Even when they would drink that water [without treatment], they were used to drinking that water, it would not give them such a disease as that.* (Léogâne, 187)

At least within the FGD participants, who had been recruited through the Gadyen Dlo program, the opinion that water was not the cause of cholera was not the norm. Most people agreed that water could carry cholera and that drinking untreated or unsafe water could cause you to contract it. In one FGD (Grivot, Jolivert Region) a participant not only talked about her neighbors who will get cholera because they did not use water treatment correctly, she said that this made cholera a problem for her too:

*I feel it is still a problem for me because I have some neighbors who don't drink it [treated water]. From the way the bucket looks, I can see that they are going to get cholera. That's still a sadness for me." (Grivot, 122-125)*

This was the first time in the focus group discussions that a participant had talked about how other people's actions put him/her at risk for getting sick with cholera. This idea is not commonly expressed, but was brought up in Tibo (North program region) and will reappear in the discussion of sanitation later on in the analysis. Finally, while water or untreated water was most often mentioned in discussions surrounding contracting cholera, most groups named cooking food well and washing fruits and vegetables with treated water to also be cholera prevention strategies. This indicates that they were aware that a person could get cholera from food as well.

### **(3) Microbes**

Communities in each Gadyen Dlo program region had heard that microbes were the cause of cholera and were at least somewhat aware that microbes can be found in both water and food. It was interesting that the relatively scientific term "microbe", in Haitian-Kreyol "*mikwob*" was used in every FGD to describe water that was unsafe to drink or contaminated with cholera. This is probably a testament to either Gadyen Dlo's trainings or more general public health prevention campaigns in Haiti. Many participants had a relatively advanced understanding of a microbe, calling it "a little parasite...that can multiply but you cannot control it" or describing how even clear water is "filled with microbes" that are "really small". Almost all FGD participants thought of microbes as being something bad, a germ or sickness that caused a variety of illnesses including cholera, small things that could even cause death.

Participants from all program regions talked about the importance of cooking food well and washing fruits/ vegetables in treated water before eating them in the prevention of cholera. A few groups even got more specific about the pathway the cholera microbe takes into the body. For example, the urban focus group of Boden in the Jolivert program region and Ferrier in the North program region both talked about the need for cholera to enter the mouth. A Boden participant talked about not touching anything because “your hand can take it to your mouth” (Boden, 71, P3). A male participant from the city of Basanblu even described the fecal-oral transmission of the cholera microbe:

*PM: The flies, they drop on the stool and go to the plates and utensils that people are using. **That is a microbe that provokes that sickness.** These people, they aren't really able to take precautions. (Basanblu, 70)*

Although Basanblu's description of the cholera microbe's pathway into the body was the most sophisticated of all the focus groups, most groups described hearing cholera prevention messages about being careful with food, water and hygiene because of microbes. Despite each Gadyen Dlo region receiving very similar cholera prevention messages, there was still a lot of doubt and confusion about the cholera microbe in most communities. For example, two different focus groups, Labutik in the Jolivert program region and Tibo in the North program region talked about cholera being a virus. The Labutik participant explained how the cholera virus persists inside a person:

*P5: I've been to a cholera training. They told me that people who have gotten sick from cholera, even if they are better, they still have the virus of cholera in their blood. It is not a sickness which can be treated. (Labutik, 414)*

It is unclear from the dialogue in either of these discussion groups whether community members distinguished between microbes and viruses or understood them to be the same thing.

Furthermore, some group participants said that they accepted that a microbe caused cholera but they still didn't understand how and why that microbe made people sick with cholera. These people wanted to know what makes the cholera microbe different from the others. They also had not received any clear messages from the government or aid organizations about where the cholera microbe came from or why it suddenly hit Haiti.

*P2: Well we know it is a microbe, and that means we avoid it with water treatment. It's just that we are not able to get the answer to what makes cholera rage in the cold times...and how did cholera come to hit our department? (Port-de-Paix, 188)*

Some groups did not trust the prevention messages at all, denying that cholera was even a microbe. A participant in the Léogâne's Section 12 said "when cholera came to rage across the country, people used to say that it was not a microbe that brought it" (Section 12, 187).

However, this participant did not explain what s/he believed to be the specific cause of cholera.

#### **(4) Poor Sanitation/Infrastructure**

Two focus groups, one in the Jolivert program region (Basanblu) and one in the North program regions (Tibo) directly connected people contracting cholera to issues regarding poor sanitation and/or poor infrastructure. In Basanblu a participant quite eloquently discussed how the conditions in which people lived affected the community's ability to prevent cholera:

*PM: The reason why we are still worried is because the conditions that people are living in have not improved. That's why I can say that cholera can still affect people.*

*...treated water is one thing, but the conditions, the way they are living is another issue. There is something they have to have and they don't have it because they say cholera comes from microbes. There are some precautions they cannot take because of their economic situation. For example, if somebody wants to go to the bathroom he just passes the stool on the ground, he doesn't have a special place to do it.*

*Several participants: Toilettes...*

*PM: The flies they drop on the stool and go to the plates and utensils that people are using...These people they aren't really able to take precautions. That's why I can say that cholera can still arrive. (Basanblu, 66-70)*

The people in Tibo expressed a similar concern, saying that the main reason that they have had so many cases of cholera is that they had problems with sanitation. They went on to describe how many people have poorly constructed toilets and so they did not use them and defecated on the ground.

Lack of piped water or “tiyo” was also considered a major danger in regards to cholera. People who did not have piped water wanted access to it because it was perceived to be safer. Others expressed the opinion that all communities should have piped water because as one Grivot participant asked: “What about when I go to another community that doesn’t have piped water and I want to drink?”(Grivot, 572, PM) Although only a few communities recognized poor sanitation to be a cause of cholera, all communities recognized that not having piped water made them more susceptible.

#### **4.1.4 Seasonality of cholera**

While there was a strong belief in all program regions that cholera was there, every community also discussed the seasonality of cholera. Participants described how cholera was worse when it was cold, raining, and cloudy and slowed down when it got hot and sunny. Many also used the phrases “*kolera renmen lapli*” (cholera loves rain) or “*kolera renmen imidite*” (cholera loves humidity). This seasonality mostly coincided with the months that each group named as being the time when cholera was the worst in their communities. Table one shows which month each focus group said cholera was the worst in their communities or in other communities in their region (See **Table 3**)

**Table 3 Months Focus Groups Reported Cholera was Worst in their Community**

<b>Focus Groups</b>	<b>Oct</b>	<b>Nov</b>	<b>Dec</b>	<b>Mar</b>	<b>Apr</b>	<b>May</b>	<b>Jun</b>	<b>Jul-Aug</b>	<b>Sept</b>
Jolivert									
Labutik									
Basanblu									
Port-de-Paix									
Boden									
Balenbe									
Tibo									
Ferrier									
Zones by ocean in the North									
Section 12	Section Not Affected								
Section 3									
Other sections in Lèogâne									

#### **4.1.5 Confusion, Disbelief, and Outrage**

##### ***(A) Confusion***

While everyone had heard very similar prevention messaging about cholera, the range of beliefs about and understandings of the causes and origins of cholera were wide. Many people were confused by the information they had received or found it to be contradictory to their experience. For example, participants from the village of Jolivert (Jolivert program region) found it hard to rationalize how a participant could have gotten cholera if she was drinking treated

water. As the discussion progressed, however, the group became less adamant about the protection water treatment gave against water treatment and started defending the woman who had gotten sick by sharing other similar stories of people getting sick who used treated water:

*P1 [to P2]: You were drinking treated water? And you were following all the rules? How did you get cholera? It is something I can't believe.*

*P2: Even if you respect all of the rules. It doesn't matter. If you are going to be sick you are going to be sick.*

*P1: So there are people who used the product but they still got cholera?*

*P3: Even my neighbor's dogs drink treated water, and she got cholera. (Jolivert 210-213)*

This idea was echoed in other focus groups in the Jolivert region as well as in Lèogâne. A Section 3 participant (Lèogâne program region) shared a story about a baby who was only drinking breast milk that contracted cholera. As we saw in discussions of where cholera comes from, many community members expressed confusion about the origins and causes of cholera. This also led to confusion about whether it was a disease that could be treated or whether it was a virus like AIDs that stays in the blood forever even after they get better.

Furthermore, many participants talked about people in their communities that believed that cholera did not come from a microbe or could not have come from water. As described previously, many other explanations existed in the community from cholera's political origins to witchcraft/supernatural forces. A Port-de-Paix participant explained that the reason his



community was confused was that they had not gotten a real answer about where it came from: “We can’t know exactly. Is it that it is the issue of water treatment that caused cholera to invade the country? Up until now we have not exactly gotten a true response” (Port-de-Paix, 188, P2).

***(B) Disbelief***

Several focus groups in the Jolivert region talked about how some community members did not truly believe in cholera or did not believe it could affect Haitians. One participant explained that many people thought “they don’t really have cholera, cholera is ‘*politik*’ [political or not real]” (Basanblu, 70, PM). Other participants described community members who could not believe that cholera was killing Haitians. Some of these community members were described as being in denial of the problem:

*P?: People around here, they hear about it, but they don’t really know.*

*P4: It is like cholera doesn’t exist for them. It is like you could be with me and you could leave the meeting and you could get cholera and I would say, “What? She was just here with us and she left and got cholera?” (Basanblu, 85-86)*

*P4: They say cholera microbe is still there but they still say that microbes can’t kill Haitians...somebody just came to me and said that a few minutes ago... If microbes could kill Haitians then there wouldn’t be any crazy people in the street. The microbes would kill all the crazy people. (Labutik, 90)*

While the idea that *mikwòb pa touye ayisyen* or “microbes don’t kill Haitians” was discussed in other regions, only people in the Jolivert program region discussed it in relation to disbelief of cholera. While other areas expressed confusion about cholera, the Jolivert region was the only one that talked about disbelief in cholera’s existence or denial that it could cause harm to Haitians.

### ***(C) Outrage***

Although this was not widely discussed across many focus groups, this outrage seems to be related to other emotions of distrust towards foreign aid or the government that was expressed in Section 4.1.3.(A) Origin of cholera: Participants from the Jolivert program region and another from the North program region expressed outrage that more was not being done in their communities. The Basanblu focus group (urban, Jolivert region) talked about negligence on the part of those in power:

*PM: We can discover in the cholera a negligence.*

*P?: Negligence. That is us that is failing.*

*PM: They have to make some efforts. We should find some protection, but that didn’t happen... What they [the people in charge] had to do, they didn’t do it.*

*PM: I have a concern... Cholera has affected more people in the countryside...If they could do a mobilization campaign, that can help these people to understand the best way to fight against cholera.. It is required to have a mobilization campaign to help these people. Just make an effort so that they can protect themselves. (Basanblu, 72-78)*

Participants in Balambi asked why they hadn't been given vaccines as protection against cholera like had been done in other countries:

*P2: We have not had even had one bit of prevention whatsoever. For example, in other countries they usually give vaccines for this thing, but not in this place for us, we don't have that [vaccines], while that same sickness could come. But if you received a vaccine or even one dose, if it [cholera] comes it may not get you.*

*(Balambi, 55)*

#### **4.1.6 Se Toujou La (It is still there)**

All focus groups regardless of what region they were in, whether they were currently experiencing cholera cases or whether they had ever had cholera in their community strongly felt that cholera was still out there (*se toujou la*). Almost everyone worried that cholera could still affect them and their communities. Only one woman in a Jolivert region focus group felt that she was protected because she treated her water and there hadn't been any victims in her house to date. As we discussed in the section 4.1.3 "Where does cholera come from?", many people were not positive that water treatment could protect them from cholera. Communities shared a sense that cholera "will always be there" (Labutik, 55) even if it not visible and this means "if you don't respect the rules you can catch it anytime" (Boden, 64). Many people expressed despair over the persistence of cholera. In the North a participant prayed for cholera to end, saying with fear that "in just a second, one negligence [wrong move], cholera will get you" (Ferrier, 54, P10). Very few people felt that they were truly safe and protected from cholera. Even unaffected communities expressed fear that cholera could and most likely will come. Communities also expressed the idea that not only is cholera still there but that it will be there for a long time.

*P3: We still think that we do not know when it will arrive because it hasn't arrived yet but it could arrive; only God knows...*

*...P3&P4: We predict it can come, but we don't know.*

*P3: It can still come because that sickness walks, it will walk. (43-50, Lèogâne 12)*

*P3: Cholera is still there. In some developed countries where people are civilized, they said that cholera used to be there and it spent 10 years and what about for us in Haiti, we don't know when it is going to be finished. (Boden, 414)*

## **4.2 Water Treatment**

Similarly to our findings regarding perceptions of cholera, our findings regarding perceptions of water treatment did not vary greatly between regions. The only major differences between regions in regards to household water treatment had to do with product availability, accessibility and price. Even the differences here were mostly superficial. Each region had different amounts and types of products available. The cholera epidemic did affect the price and availability of products in each region as NGOs or MSPP (Ministry of Health) conducted free distributions of various household water treatment products. This in turn affected both a person's choice of whether or not to use water treatment as well as his or her choice between brands of product. Brand loyalty seemed to be strongest in the Jolivert region, but the Jolivert region also typically had the least number of options for water treatment products and generally fewer free distributions close to their house.

### **4.2.1 Treatment Methods or Products**

### ***(A) Availability of Products by Region and Time Period***

Product availability varied between regions and changed over time in relation to the cholera outbreak. It is interesting to note that our original question was ‘What were the products available in your community before, during and after cholera?’, but after all communities asserted that cholera was not yet finished we changed the category of “after” to “now”.

Differences in regional availability are not surprising as many water treatment products are distributed by NGOs that operate in specific regions. Fluctuations in availability of products over time are similarly not surprising as many communities experienced several rounds of emergency free distributions both in the aftermath of the earthquake, and then again due to cholera. At the time of our FGDs, the North region reported several very recent free distributions with a few more to come in the near future.

Communities in the rural Jolivert region as well as Basanblu, an urban Jolivert region community located 10 minutes down the road from the Jolivert sodium-hypochlorite production site, all consistently reported Gadyen Dlo as the most used product before, during and after cholera. Two of the three North programs showed a transition from the “Kado Dlo”/”Gift of Water” two-bucket filter system (before cholera) to Gadyen Dlo. The program of Ferrier showed the number one product available as being Aquatab. They explained this was because free distributions of aquatabs were widely available in the region and their Gadyen Dlo distributor had run out of product. This community was selected for inclusion in FGDs because it had not yet transitioned to selling the Gadyen Dlo product from previous free distributions. This is probably why the product is not available in Ferrier. Léogâne showed a similar transition from Aquatabs to Gadyen Dlo over time. (See **Error! Reference source not found.**)

**Table 4 HWT Methods Before Cholera, During Cholera and Summer 2012 Listed in Order by Use**

Focus Group	Before Cholera	During Cholera	Summer 2012
<b>Jolivert Region</b>			
Jolivert(rural)	1. Gadyen Dlo 2. Aquatab 3. Boiling	1. Gadyen Dlo 2. Aquatab	1. Gadyen Dlo 2. Aquatab
Labutik(rural)	1. Gadyen Dlo/Boiling	1. Gadyen Dlo 2. Aquatab	1. Gadyen Dlo 2. Aquatab
Grivot(rural)	1. Gadyen Dlo 2. Dlo Lavi 3. Boiling 4. Clorox 5. Aquatab	1. Gadyen Dlo 2. Dlo Lavi	1. Gadyen Dlo 2. Dlo Lavi
Basanblu (urban)	1. Gadyen Dlo 2. Boiled Water 3. Aquatab 4. PUR	1. Gadyen Dlo/Aquatab 2. PUR/clorox	1. Gadyen Dlo 2. Aquatabs 3. PUR
Port-de-Paix(urban)	1. Clorox grain 2. Aquatabs	1. Gadyen Dlo 2. Clorox (chlorine) 3. PUR 4. Aquatab 5. Boiled Water 6. Jif (chlorine)	1. Gadyen Dlo 2. Clorox grain/liquid
Boden(urban)	1. Gadyen Dlo 2. Aquatabs 3. (other products available but not used)	1. Aquatabs 2. Gadyen Dlo 3. Filter system	1. Aquatab 2. Clorox 3. Filter system 4. Syringe 5. Dlo la Vie 6. PUR 7. Gadyen Dlo
<b>North</b>			
Balambi	1. Kado Dlo filter (w/Clorox) 2. Clorox 3. red & white filter system	1. Gadyen Dlo (w/ Kado Dlo filter) 2. Aquatab	1. Gadyen Dlo 2. Aquatab
Tibo	1. Kado Dlo filter (w/Clorox) 2. Gadyen Dlo 3. Aquatab	1. Kado Dlo filter 2. Aquatab 3. Gadyen Dlo	1. Gadyen Dlo/Kado Dlo Confusion 2. Aquatab 3. Dlo la Vie
Ferrier	1. Boiled water 2. Kado Dlo filter (w/Clorox) 3. Kado Dlo filter (w/Aquatab) 4. Kado Dlo filter (w/Kado Dlo's 'Clorox')	1. Kado Dlo filter 2. Aquatab 3. Gadyen Dlo 4. Clorox	1. Aquatab 2. Gadyen Dlo/Clorox 3. Dlo Lavi
<b>Léogâne</b>			
Section 12	1. Aquatab 2. Boiling 3. Gadyen Dlo 4. Clorox 5. SODIS	1. Gadyen Dlo 2. Clorox liquid 3. Aquatab	1. Gadyen Dlo
Section 3	1. Aquatab 2. Gadyen Dlo 3. Boiled Water 4. Clorox	1. Gadyen Dlo 2. Aquatab	1. Gadyen Dlo 2. Aquatab 3. Clorox grain & liquid

## ***(B) Product Perceptions***

In terms of overall impressions of products available in the community, Gadyen Dlo was reported by all focus groups to have the best taste and quality. Gadyen Dlo's taste was described as light and fresh and free of the bitter taste of clorox typical of other water treatment products. While people reported using Gadyen Dlo for a few other household chores, participants reported mainly using Gadyen Dlo to treat their water. Reasons for this high quality designation range from the way it protects you, to its packing and Special bucket, to trust in its efficacy and safety. They loved that it was so simple to use, only takes 30 minutes to prepare and had residual protection for up to three days.

The second most admired water treatment product after Gadyen Dlo is Kado Dlo with its two filter bucket system. Participants in the North feel that this two bucket system is superior to that of Gadyen Dlo's Special bucket because it has a dual action. The filter is able to trap microbes in the top bucket and keep them from getting into your drinking water at all, chlorine is added for residual protection and to catch anything that may have been too small for the filter. While they like the Gadyen Dlo product, especially for its taste, this program region would love to have more distributions of the Kado Dlo buckets because they place more trust in them.

Many people doubt the safety of products such as clorox or Gif which are household bleaches for use in drinking water. While some people have used it to treat water in the absence of Gadyen Dlo or other products, most say that they use it primarily for non-drinking tasks such as cleaning, showering and doing laundry. The phrase it tastes like 'clorox' is used to describe other products that have a "bitter" chemical taste to them. Most people consider clorox to be poisonous.

The products that were most negatively viewed across all program regions were Aquatabs<sup>8</sup>. Aquatabs come in a variety of sizes to treat various quantities of water. While some participants knew this, all of them expressed confusion about the proper Aquatab to water ratio. Aquatabs were widely distributed as part of the emergency response efforts to the earthquake. Many communities described very serious problems that arose from a lack of adequate trainings on correct usage of Aquatabs before they were distributed. Many communities reported deaths from using Aquatabs incorrectly, putting too many in their water, or taking it as a pill. This finding achieved saturation relatively quickly as concerns over the safety of the Aquatab product arose in each and every focus group across all three program regions. Achieving saturation means that this idea emerged as a major theme within the first few FGDs that were coded and analyzed and continued to repeat in the same way without much variation throughout the remainder of the FGDs. Participants shared stories of people swallowing Aquatab pills like medicine and compared it to Clorox saying that it can “reduce our bowels and at the end it will kill us” (Labutik, 321).

*P?: I just remember that somebody who had a headache, he drank the Aquatab and the Aquatab cut up his bowels and he died. (Labutik, 26)*

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<sup>8</sup> Aquatabs are rapidly dissolving water disinfection tablets that are manufactured by the company Medentech which is based out of Ireland. Because the pills are small, light and easy to transport they are often distributed for use in emergency settings. Not only were Aquatabs consistently described as being too strong or bitter, they were also considered to be highly dangerous. For more information, see the product website [www.aquatabs.com](http://www.aquatabs.com)



*P4: There are some people that took the Aquatab. This is the reason they don't like it, it is because they take it and they drink it, they don't know how to use it. They drank it like medication and they died and that happened in Savann Karie. (Basanblu, 261)*

The perceptions surrounding Aquatab reported by focus group participants contain much of the same elements of distrust and fear that arose in the discussion surrounding the origins of cholera in Haiti. They believed that the deaths from Aquatabs were part of a foreign or governmental plot.

*P7: Aquatab, that's what they give to kill people...*

*P8: It's not a lie, in the "Goudou Goudou" (Earthquake) some people were left [alive], they needed to kill them*

*RA-You said they gave out Aquatab to people to kill them?*

*P7: Yes, it is not good, it is Clorox that stuff. (Section 3, 400-405)*

#### **4.2.2 Water Treatment Behaviors**

Participants from every community talked said that treating drinking water was just one of the many ways that they used water treatment. Participants said that people in their communities used water treatment for almost everything because of the health messages that they had received. Communities used water treatment for a variety of activities including cooking, washing fruits and vegetables, hand-washing, bathing and cleaning dishes and utensils in order to protect themselves against microbes. Most groups talked vaguely about avoiding

microbes by treating the water you are going to use for any of these activities but one community member from the North program region explained it in greater detail:

*That's it, they get treated water to bathe because when you bathe in water, you might drink some too because it is in your body that it can enter. That means you want to take precautions with the water you will bathe with. The water you bathe with, you can drink it. (Balambi, 214-215)*

Most discussion groups did not talk about when they started using water treatment for all these different activities, but many of these activities were also described in the context of cholera prevention activities.

Participants from all communities responded similarly to questions about how often they used water treatment. Participants expressed that people in their communities generally used water treatment consistently saying that people treated their water all the time or every time they refilled a bucket. For some people this meant that they treated their water several times a day or several times a week, depending upon how many people lived in their house or how hot it was (e.g. how much water their household consumed). For example:

*PM: Before cholera, we treated the water mostly for drinking. If the person went to get the water from the river or source water, when they get home with it, they treated it. Anytime the water is finished, it depends on how many people you have in your home, if it lasts a week you treat it once a week, if it lasts two days, you treat it then. (Basanblu, 136-137)*

While sometimes people talked about treating their water every few days when they ran out, several participants also pointed out that only certain products allowed you to store your water for more than one day before without it becoming unsafe.

When the facilitator asked if there were certain times of year that people used water treatment more frequently, a few groups mentioned how cholera increased the use of water treatment, but most groups said that people used water treatment year round. Interestingly, one focus group participant in Léogâne said that although there was not a particular time of year that people treated their water, there were times of year that people might be more negligent, but this idea of using water treatment seasonally or according to the weather was not discussed in other focus groups.

*P6: I can say that there is not a period of time when people treat water, but there is a period of time that people might be more negligent than other times, because I'm used to seeing this. Often when the rain might be falling, when the rain is falling many people focus more on it [water treatment]. They say I have to treat my water because I cannot drink it like this. But, as those people see that there isn't rain, those people get a little negligent. After that they say 'I don't have anything' and they will drink it [water] just like that. And after the rain falls those people say they should treat the water because if they don't treat it, they won't drink it, they won't serve it. That makes me able to say that in the time of the year where the rain falls people use products to treat their water more. (Section 12, 89)*

#### **4.2.3 Behavior Change**

Participants discussed many factors that influence: (1) uptake of water treatment in the community or to what extent people ever try the product, use it on occasion, or use it for a period of time such as after a free emergency distribution and (2) adherence or sustained, consistent use of water treatment in the community.

### ***(A) Community Trainings/Mobilization***

Community trainings are an important component to behavior change. Participants talked about learning about water treatment through community meetings in churches or other public areas and often receiving a HWT product for free. People who choose not to use water treatment are sometimes described as people who ‘missed the trainings’:

*PO: The people that say the Gadyen Dlo ... they aren't going to drink it, I'm not going to say they are wrong, because they didn't come to the trainings.” (Grivot, 85)*

Because the FGDs took place in communities served by the Gadyen Dlo program, most if not all of the community trainings and mobilizations relating to water treatment involved Gadyen Dlo and the Special bucket system. Community trainings were not only spaces to increase awareness and acceptance of the products, they provided education on how to properly use the product, and they also often provided an opportunity for product purchase:

*P4: After the meeting, everyone accepted it and said it was good to buy it” (Jolivert, 443)*

*P2: They had a meeting and talked to them and we took our money with us and after the meeting we bought the product. We bought the bucket with Gadyen Dlo.*

*P4: You come to the meeting you come with your money and after the meeting you decide to buy. (Jolivert, 339-440)*

Conversely, lack of training and education regarding water treatment products is viewed to be dangerous. Participants in Grivot warn against buying water treatment products from the market because the resellers who are not health agents and do not work with Gadyen Dlo cannot properly explain how to use the product. They say this can make you think that your water treatment is ineffective or dangerous as you are likely to put the wrong amount in your water.

*“PO: They don’t give them any information when they buy it in the market. When they return to their house they just pour it in without any control. The water becomes bitter. They can’t drink it, but it is because in the market they buy from people who are walking through shouting out their wares. They buy it and they don’t take any information about how to use it.” (Grivot, 85)*

### ***(B) Environmental/water quality concerns***

Although this was not discussed across all program regions, it did come up quite often in the Jolivert program region. These people expressed environmental concerns related to the safety of their water sources and for that reason they chose to use water treatment. Groups described trash and microbes around their houses, rivers and other water sources. Some people related very disgusting images of poor quality drinking water and how using water treatment prevents them from having to experience those things:

*P?: When you don't treat the bucket and you cover it and you let the product rest, after a few days you are going to see some parasites in it. And when you pour out the bucket and you pass your fingers on the bottom of the bucket you are going to feel it is slippery. But when you treat the water, that doesn't happen. (Jolivert, 84)*

*PO: People used to drink water with snails in it. (Grivot, 167)*

Yet for people who have not had these visual experiences with poor water quality, the inability to see the microbes in water can serve as a barrier to belief in the need for water treatment:

*P7: They used to think that it was good to drink after it was clear or not salty and they saw it wasn't with...If it was clear, then they still thought it was good water. (Section 12, 160)*

## ***(C) Water Treatment Behaviors in Emergency Settings***

### ***(I) Cholera Outbreak***

Our data quickly achieved saturation in regards to cholera being a major reason many people started to use water treatment. Although all groups reported water treatment methods being used in their communities before cholera arrived, they also talked about many people who either did not know about treating their water, “didn't give any importance to water treatment” (Jolivert, 184, P2), or just straight up did not believe in household water treatment:

*PM: In my community, we had some people that didn't use water treatment before cholera. I can tell you they are St. Thomas, they can only believe it when they see*

*it. It is just during the cholera outbreak, some of them who were not hardheaded, they started using Gadyen Dlo to treat their water. But, before cholera arrived there were some people that said they'd NEVER do it. It would never exist for them. (Grivot, 133-135)*

When cholera arrived, most groups talked about people becoming so fearful of contracting cholera that they ran to look for water treatment or begged for treatment from their neighbors. This is described in section (B) Fear and behavior change. However, the distrust and uncertainty about the true nature of cholera leads many to believe that cholera is political or something that is not real. Participants talked about community members that did not treat their water because they did not believe that cholera was real or posed a threat to Haitians. This served as a barrier to some people to both trying and adhering to household water treatment.

## **(II) Free Emergency Distributions**

The demand for water treatment was so desperate that a few focus groups even talked about fighting at free distributions. Free emergency distributions occurred in all program regions. Groups had heard that the free emergency distributions were happening regardless of whether or not it was close or convenient enough for them to attend. There were differences in region in the number of free distributions that a region had received and the products that were offered at these free distributions. But in terms of behavior change, these free distributions often acted in the same way. Among non-users, free-distributions were often the reason a person started using water treatment or was able to keep using water treatment on a regular basis:

*P2: during the cholera epidemic they gave free buckets and water treatment to everybody at the clinic. Even if you used to buy it. They gave it to you for free. That's why they still continue using the product. (Jolivert, 186)*

For the most part, people expressed satisfaction and gratitude for the free distributions in their communities because they felt like someone was trying to protect them . However, a few communities shared negative experiences of fighting at a free distribution that lead to the distribution to be shut down. Others shared stories of disorganization and lack of education/training in the distribution of Aquatab products which led to the deaths of several community members. This theme of the dangers of Aquatab did reach saturation across FGDs. This will be discussed in greater detail in the **Error! Reference source not found.** section of the results.

*P?: I just remember that somebody who had a headache, he drank the Aquatab and the Aquatab cut up his bowels and he died ...*

*P2: The person that received the Aquatabs didn't have any trainings for that. That is why that happened. (Labutik, 26-28)*

Similarly there was some tension between a product being free and therefore affordable and easy to access and the idea that free products were somehow lower in quality, but this theme was not widely expressed across the data:

*PO-When some people find something for free , they think it is free because it are not good. But there are some people that only want free things. If a person knew*



*that they needed to buy the product, but they can find it for free, he'll be interested in getting it for free.” (Grivot, 541)*

It is also important to note that in situations involving a decision between products that were provided for free and paid products, the community generally chose those that were free, regardless of which they thought was of better quality.

#### ***(D) Social Support***

Many communities discussed the role of social support in the adoption of household water treatment behavior. This theme was talked about from both a positive perspective in the case of neighbors sharing filtered water with those that did not have filters in the North program regions, as well as from a negative perspective where non-users called people who used the product names. Positive social support allowed people to overcome barriers such as difficulties adjusting to water treatment and the bad taste associated with chlorine-based treatment products:

*PM-in my neighborhood there are two people that have the same problem. When they drink it, it gave them the same problem. I tried to reason with them. I said to them, when that happens, it is because it is cleaning up, you have to continue to drink it... In the third week they did it and when I passed by them after that in the neighborhood and I asked them, 'how does it make you feel ?' and they said, 'I feel normal'. ... The “dlo” is cleaning up all the microbes that it found. That's why it gives you a little stomach ache or it can give you another sickness. If the person continues with it...even if it hurts you, you should stay with it and you will see that this is what you want to use all the time. (Grivot, 105)*

*There are several stories across multiple regions of people sharing their treated water with others who do not have access to it:*

*P0: Those are the people who have the filters...and then now this makes a person who has it [filtered water] prepare it for another, people who know the importance of the water (“dlo a”).*

*P2: Because it is not everyone that has it [the filter], now everybody wants to have it but it is not easy to get. (Ferrier, 125)*

Examples of negative social support or stigma against people who use water treatment included name calling and teasing with phrases like “You don’t have anything better to do: (Jolivert, 466, P3) or “people who drink water treatment, they drink it because they think that if they do they won’t ever die... They say ‘the treated water cannot stop your death’” (Grivot, 128). The negative stigma also went the other direction, with water treatment users using judgmental terminology such as “rebels”, “negligent”, “fou”/”crazy” or “avèg”/”blind” to describe people who do not partake in water treatment practices.

### ***(E) Household Visits***

Household visits are a theme related to behavior change in household water treatment that reached saturation in our data. In every program region, although not in all of the communities that Gadyen Dlo operates in, there was a Gadyen Dlo agent that was described as conducting household visits to check the Special bucket for cleanliness and test the drinking water for chlorine residuals. These home-visits served a dual purpose, to inspire positive water treatment practices and high adherence through a desire to please on the part of program

participants and positive-reinforcement given by Gadyen Dlo agents as well as reassure community members of the safety, efficacy and correct usage of water treatment products.

*P5: They tell us to buy the bucket and we buy the treatment, and we always have home visits for them to see if it is treated or not. If you don't treat it, they will write that down in a report that you didn't treat it. It is better when you treat it, so that when they test it, they say it is positive and they will congratulate you for that. (Labutik, 87)*

*P1: For a person that may think the water is still not good after he's prepared it [with water treatment], even if he [the Gadyen Dlo technician] himself knows it is good, he comes to prepare the water test in front of the person again, to make him understand that it is good. (Ferrier, 146)*

### ***(G) Health and economics benefits***

In discussing the reasons that community members think water treatment has made a difference in the community, many people started talking about the health and economic benefits associated with use of water treatment. All regions talked about health benefits in terms of feeling good when you drank it, protections against microbes and disease and reductions in gastrointestinal illness.

*P4: When I was young I used to drink untreated water. I always had stomach aches but I didn't know the reason why I had it. I didn't know it was the untreated water that I drank. So when I went to the hospital they gave me medicine and they*

*said don't drink the water without treating it... Since I started doing that I've never felt those symptoms. (Boden, 227)*

People in the rural Jolivert regions take the health benefits of water treatment a step farther, telling stories about people with illnesses that went away after drinking treated water for a week or two. For them, water treatment, and in particular the product Gadyen Dlo, has a sort of healing power:

*P?: I can tell that treated water is good. If you continue drinking the treated water, if you had worms, the microbes will die anyway. The worms are going to die in your stomach. It is because the worms can find the microbes in the stomach, that is why they are able to move. But if they cannot find any microbes in your stomach to eat, they will die. The worms are going to die because you are drinking the treated water.(Grivot, 106)*

Participants also quite often also mistakenly identified malaria or a disease they called “typhoidmalaria” as one of the diseases that drinking treated water prevented you from contracting. Unfortunately the Haitian belief that “mikwob pa touye ayisyen” or “microbes don't kill Haitians” and disbelief that drinking untreated water could cause you to get sick are barriers to the realization of these health effects. Also, many FGDs described stomach aches and nausea as being side effects of drinking treated water. It is hard to rationalize using something that makes you feel sick to prevent yourself from getting sick.

Although this is a less pervasive theme in the data, many people discussed the importance that health had on finances. Many talked about health care expenditures averted by the investment in water treatment and one participant talked about the cost of a bottle of Gadyen Dlo in comparison to a trip to the hospital. It was interesting that although community members made the connection between health and saving money, no one considered the increased opportunities for productivity and employment enjoyed by healthy people.

## Chapter 5: Discussion

### 5.1 Role of Location

Our study included qualitative data of communities from three different Gadyen Dlo program regions. While context and place is always important to the understanding of qualitative data, we found that community perceptions of both cholera and water treatment were more similar than not between regions. This is perhaps most interesting given the amount of time that it takes to travel between each of these different program regions. Léogâne to Jolivert is a 6-7 hour trip by car or tap-tap<sup>9</sup>, Jolivert to the North is another 4-6 hours by car or tap-tap, and the North to Léogâne is such a long distance that DSI program supervisors typically take a plane when travelling between the two sites. The trip would most likely be between 8-10 hours in a car of tap-tap. Despite these distances, the same basic themes emerged in regards to both cholera and household water treatment. Not surprisingly, the differences in perceptions between these regions with vastly different histories and geographies were not only minor but most of them were expected.

Our qualitative findings show that regardless of where a community is located, the disease of cholera pervades the community's thoughts. Many of our findings corroborate those reported by (Grimaud & Legagneur, 2011) who published findings from psycho-social interviews to raise awareness in communities affected by the earthquake conducted by the Haitian Red Cross in Léogâne, two urban slums in Port-au-Prince and in Petit-Goâve from mid-November to December 2010. The Port-au-Prince and Petit-Goâve areas are not covered by the

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<sup>9</sup> Truck or bus that serves as both short and long-distance transportation in Haiti

Gadyen Dlo program and it would be reasonable to expect that different findings might emerge here. But, as we saw across our own data, the findings of (Grimaud & Legagneur, 2011) were very similar to ours and further corroborate the fact that cholera is not a regional issue, but an issue that is country-wide.

Although geography and infrastructure did not seem to change the messages communities received about cholera, it definitely played a role in how the disease was experienced in each of the communities we interviewed. For example, people in the rural communities in Jolivert shared more stories about people dying on the roads on their way to seek treatment. This is not surprising given that communities in rural Jolivert are remote and the mountainous roads that link them are very poor, making it more challenging to reach a clinic or hospital before the disease causes too much dehydration. Rural communities in the Jolivert region also seemed to have more direct personal experiences with cholera, sharing stories about family members and neighbors who were affected. The intensity of their experience of cholera probably had much to do with deficits in water, sanitation and transportation infrastructure. Participants in the North and Léogâne program regions talked more generally about cholera affecting people in their community. The only region where we found a focus group whose community had not been affected at all by cholera was Section 12 in Léogâne. This community was located on a mountainside and its higher altitude may have helped to keep the community's water from being affected.

## **5.2 Fear, Distrust and Uncertainty**

The perceived susceptibility to cholera was also very similar across regions and did not seem to be greatly affected by where a person lived. All communities expressed fear of cholera and worried about it affecting themselves, their families or communities. This was perhaps most

interesting in regards to the issues surrounding the causes or origins of cholera in Haiti. Regardless of location, communities all described receiving cholera prevention messages explaining that it was a “*mikwob*” or “microbe” that could enter the body through unclean water or contaminated food. Each group described the same basic list of prevention strategies. But also, regardless of their location each community expressed doubt about the reliability or truth of these messages. Although the ways that they described these doubts and confusion varied by community, all reported a large uncertainty about cholera that led some in the community to question whether it could actually be prevented.

There were several similarities between themes that arose in our data and those reported by (Grimaud & Legagneur, 2011) about perceptions of cholera in Haiti. Like us, they found that people were doubtful of the causes of cholera. Interestingly, the communities the Haitian Red Cross spoke with expressed their doubts in much of the same way as the people who participated in our FGDs. We both found that communities talked about beliefs that “*Mikwob pa touye Ayisyen*” or “*Microbes don’t kill Haitians*”, cholera did not come from a natural source, and that behaviors people had been doing their whole lives could not just suddenly cause them to get cholera (Grimaud & Legagneur, 2011). (Grimaud & Legagneur, 2011) also reported the community’s suspicions that cholera was political or may have been purposefully brought by foreigners. Interestingly, while Grimaud and Legagneur do not report any story of “cholera helicopters”, they do talk about “cholera powder” that many community members believed had been dumped into community water sources by vodou practitioners. The Red Cross findings overlap with our Labutik focus group’s story about the “cholera powder” sprinkled out of helicopters by “white people” (foreigners) and Boden’s discussion of “*makanda*” or “witchcraft” being the reason for cholera.



These findings have important implications for the public health response to cholera. While messages are reaching many regions of Haiti, they are equally distrusted. The ability to send information to even the most rural communities is possible, but the ability to dispel uncertainty surrounding cholera and distrust in NGOs, international aid organizations and the government will be much more difficult.

Unfortunately, the similarity in our findings shows that little progress has been made to address the confusion, disbelief and distrust that affect the ability of the Haitian community to effectively respond to cholera. In fact, many aspects of the disaster response and the investigation of the source of cholera in Haiti not only did little to address issues of distrust, but probably exacerbated the problem in the years following the Haitian Red Cross study. Although the Haitian Red Cross published their results so that they could be incorporated into aid work and government response (Grimaud & Legagneur, 2011), it seems very unlikely from the findings of our study that they had been. Furthermore, the drama surrounding the investigation into the source of cholera in Haiti confirmed fears that cholera had been brought to Haiti by foreigners. Historical tension with the UN Peacekeeping Force MINUSTAH in Haiti was compounded not only by a lack of consistent and clear messaging about the investigation, but also a refusal by the UN to accept full responsibility for the outbreak. These factors make it very hard for Haitians to believe that cholera was not purposively inflicted upon the Haitian people.

(Grimaud & Legagneur, 2011) also discuss the themes of sadness, loss and fear which are important in our results as well. In both studies people expressed fear of contracting cholera and talk about the loss of family members and community members. Grimaud and Legagneur also raise an important point that comes up in our results about the way that cholera victim's bodies are treated after they die. They observe that because the body is contagious after death,

the funerals and rituals surrounding death which “represent an important part of the grieving process” in the Haitian culture are often shortened or abandoned (Grimaud & Legagneur, 2011, p. 30) . They also observe how “this uncertainty feeds feelings of insecurity and fear” (Grimaud & Legagneur, 2011, p. 27). This was something that we observed as well.

Furthermore, these findings highlight the challenges NGOs and international aid organizations working in Haiti will face in the upcoming years. Not only will they be working in the tense and fear-ridden context of cholera, but they will most likely face a fundamental level of distrust within the communities that they work. Although anger was not an emotion expressed in the focus groups we conducted, the Red Cross reported violence against vodou practitioners who many believed to be responsible for the epidemic (Grimaud & Legagneur, 2011). Unfortunately, it will be necessary for NGOs and international aid organizations in Haiti to take necessary precautions to ensure that they will not be the target of violence.

Because this study was conducted before UN Secretary General Ban Ki-moon rejected legal claims for compensation for cholera victims in Haiti, it is possible that perceptions of foreign culpability for cholera have deepened. Although given that perceptions did not appear to have changed from the time of the Haitian Red Cross study in 2010 and our study in the summer of 2012, it is unclear how much this news reached the Haitian people and to what extent it may have changed the way they already view the situation. More studies will be necessary to determine what effect more recent events have on community perceptions of cholera.

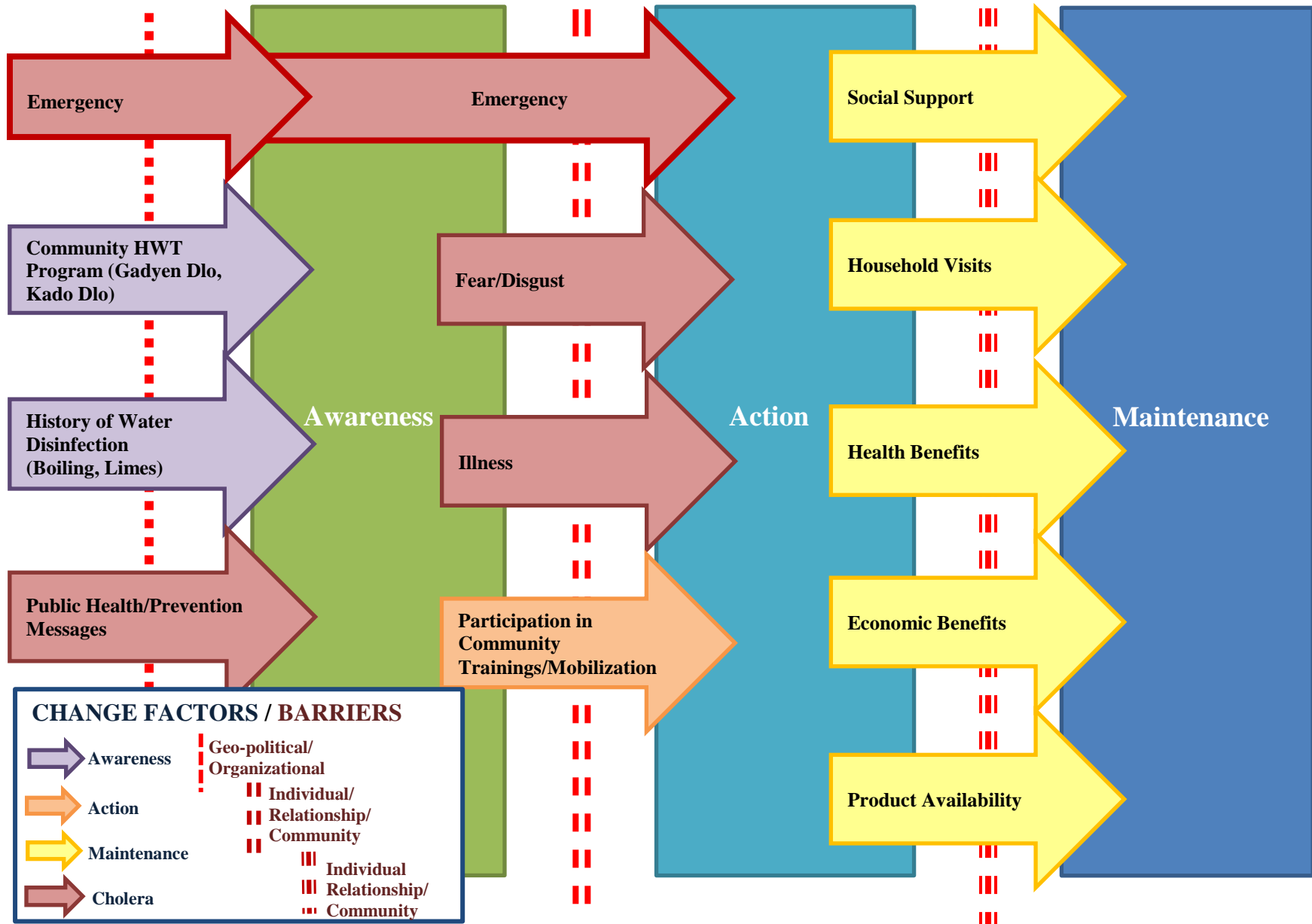
Finally, because community members were uncertain about cholera’s origins and causes, they often expressed uncertainty that they could prevent themselves from getting sick. This meant that almost everyone felt susceptible, at risk and fearful that they would get sick. As

(Grimaud & Legagneur, 2011) discuss, the fear, sadness, uncertainty and confusion compounded by the inability to go through the traditional grieving process due to public health need to dispose of bodies may have negative psychological consequences on Haitian community members. We agree with recommendations made by (Grimaud & Legagneur, 2011) that mental health needs of community members need to be addressed along with cholera prevention messaging in the wake of this country-wide epidemic. As it is difficult to provide basic health services to most Haitians, providing mental health services to the vast number of community members suffering from the trauma of cholera will be especially challenging. Nonetheless, organizations providing services to Haitians should be aware of this need and the government of Haiti should consider it in its national public health strategies.

### **5.3 Behavior Change**

In this section, I will present a Conceptual Framework for Household Water Chlorination (HWC) Behavior Change in the Time of Cholera in Haiti and explain how certain change factors serve as actors to move people through a behavior change continuum from *awareness* to *action* to *maintenance*. Please refer to Figure 4 on the following page.

**Figure 4: Conceptual Framework for Household Water Chlorination (HWC) Behavior Change in the Time of Cholera in Haiti**



### **5.3.1 Conceptual Framework for Household Water Chlorination Behavior Change**

This conceptual framework for behavior change related to household water chlorination (HWC) was adapted from the behavioral framework developed by PATH's Safe Water Project presented in Chapter 2: Literature Review (See Chapter 2: Literature Review, Figure 2). PATH's Safe Water Project's stages in the behavior change continuum of *awareness*, *action* and *maintenance* provides the backdrop for the Haiti HWC behavior change framework. To recap, the *awareness* stage involves priming individuals to believe that there is a need for water treatment and then making them aware of and place value on the products available to meet those needs. Individuals pass into the second stage of *action* when they learn to use a product and agree to try it. The third and final stage of *maintenance* involves making permanent behavior changes in regards to purchases and household routines (Wood et al., 2012).

In an effort to understand our study's findings from a more programmatic point of view, I have identified several change factors that coincide with movement through a stage in the behavior change continuum. These change factors were identified for inclusion because they all represent themes that reached saturation in our results. While some of these change factors may be applicable in more than one location (i.e. before *awareness* and also before *action*), I presented them where they most often fell within the context of our discussions. In the following section I will first present the change factors that occur at each stage along the behavior change continuum. Within this discussion, I will highlight which of these factors are directly activated by the current cholera epidemic (displayed in salmon in the framework). This does not mean that these change factors do not exist outside of the context of cholera, just that in the midst of the cholera epidemic in Haiti, these change factors most often arose when the group was discussing cholera. I will also discuss the barriers that affect passage through these stages of change and how these change factors may or may not address them. Finally, I will use this framework to

both inform broader public health implications and make specific recommendations for NGOs like Gadyen Dlo that aim to improve access to safe drinking water in Haiti.

## **(A) Awareness**

### **(I) Change Factors**

We observed four change factors for *awareness* in our FGDs: Emergency, Community HWT Programs, History of Water Disinfection, and Public Health/Prevention Messaging. These change factors typically all occur at the broader community level and are less related to an individual's behavior. Because movement into this stage is passive and does not require any action on the part of the individual, this is the stage that is easiest to obtain through public health interventions. The communities in which we conducted FGDs had all reached the *awareness* stage of the HWT for all of the reasons described in the diagram. Gadyen Dlo had been operating in their communities for many years. Some communities had exposure to HWT prior to Gadyen Dlo's arrival by other community HWT programs such as the *Jolivert Safe Water for Families* program (Jolivert region) and *Kado Dlo* or *Gift of Water* program in the (North). People were generally aware of the products that were available including those listed in the Results (A) Availability of Products by Region and Time Period. A few individuals described disinfecting their water with other methods such as boiling or the addition of lime before HWT programs or products came to their communities. These participants were already aware of the need to make drinking water safe and just needed to be made aware of the products that were available and advantages of those products over the methods they were already using.

While most people in Gadyen Dlo communities had reached awareness of HWT in those ways, the few people that somehow were not reached by HWT programs were catapulted into

awareness by some sort of emergency. For most people this emergency was cholera, although a few communities talked about severe weather events such as cyclones that predated cholera and were met with a similar public health response regarding safe water. In the wake of emergencies, health/prevention messaging increased and there were often large-scale distributions of water treatment products. As we discovered in our FGDs, the emergency cholera prevention messaging was widely received in communities regardless of their locations. Details about free distributions were also widely distributed. Many FGD participants reported hearing about free-distributions of water treatment products that they did not actually attend. These last two, emergency and public health/prevention messages, are presented in salmon color because they were enacted by the cholera outbreak.

## **(II) Barriers to Change**

While this movement into the *awareness* stage can be passive on the part of the individual, it is largely dependent upon certain geo-political factors and on the actions of larger political and organizational actors. This means that while it requires the least effort on the part of the individual, there are still many barriers that prevent people from passing into this stage. Barriers to the *awareness* stage are on the geo-political and organizational level. Most of the barriers to change correspond directly to a change agent. For instance, if in the wake of an emergency there is no public health response on the part of the government, local NGOs, or aid organizations, people may not receive the messages they need to learn about HWT and move into *awareness*. Similarly, in the absence of an emergency, communities without the presence of a community HWT program such as Gadyen Dlo, Kado Dlo or the Jolivert Safe Water for Families might not receive the exposure to products and methods necessary to move into

awareness. Lack of access to education or information about HWT is a significant barrier to achieving the *awareness* stage of the Behavior Change Continuum.

## **(B) Action**

### **(I) Change Factors**

The *action* stage is expressed in the data as the time that people make up their minds and actually start using a water treatment product. Emergency, fear/disgust, illness, and participation in community trainings/mobilizations all emerge as change agents that bring people from the *awareness* stage to the *action* stage. It is important to note that while the change factors related to *awareness* were largely community or geo-political level factors, change factors related to *action* occur mainly on an individual level and require active participation in the process of change. An emergency is shown to have special agency within our framework. An emergency has the power to catapult people through the *awareness* stage to the *action* stage because require swift action and inherently involve other change factors such as public health/prevention messaging, fear/disgust, and illness. This is especially true for an emergency epidemic such as cholera, an *illness* which has propagated a broad *prevention messaging* campaign and is greatly *feared* in the community.

Furthermore, several aspects of emergency response engage people to move into to the *action* stage. While hearing about emergency distributions of water treatment led people to become *aware* of both the need for treated water and the products available, receiving emergency free distributions of water treatment products gave people a chance to take *action*, providing them an opportunity to learn how to use a product and test it out. We saw some variation here in an emergency free-distribution's ability to inspire use of a water treatment



product. The efficacy of an emergency free-distribution was largely dependent upon product(s) were used for the free distribution. For example, many people reported that when Clorox bleach was distributed as a water treatment product many people chose instead to use it for laundry and therefore did not pass into the action stage.

The strong emotions of fear and disgust are powerful change agents towards *action* in the water treatment behavior change continuum. Fear of cholera is described countless times in the data as a highly motivating factor to use water treatment. Communities describe “neglectful” people running to get water treatment, begging their neighbors for treated water because *yo pé kolera* “they fear cholera”. Our findings corroborate those of several other studies discussed in Chapter 2: Literature Review that described fear of cholera as an important agent for change in water, sanitation and hygiene related behaviors (Curtis et al., 2009; Dunston et al., 2001; Wood et al., 2012). Dunston et al. (2001) specifically attributed the rapid uptake of Population Service International’s (PSI) sodium-hypochlorite program to fear associated with a cholera outbreak.

The emotion of disgust did not appear in the literature we reviewed for household water treatment-related behavior change, however it emerge in our findings as an important emotion for behavior change in regards to household water treatment in our study. For example, many people described disgust at the quality of their water prior to adding a household water treatment product. For example, many people described their disgust about seeing visible worms or parasites in their collected drinking water or evoked unsavory images of animals dying in water sources in describing why they chose to use water treatment. Both fear and disgust elicit a strong emotional response and this emerged as an important change factor towards achieving the *action* stage in household water treatment behavior.

Illnesses were often invoked as reasons that people first decided to use try a water treatment product. In most scenarios, a person described going to a health professional because they or their children were suffering from diarrheal disease and being advised to treat their water. As in the case of free distributions, the products suggested by doctors varied based on a variety of factors. No FGD participants, however, described deciding not to use a water treatment product or deciding to use it as a detergent when it was suggested by a health professional. As most of the illnesses that acted as change factors towards *action* were related to gastrointestinal illness it is possible that it often acted in conjunction with *disgust*.

Finally, participation in community trainings or mobilizations organized by water treatment programs such as Gadyen Dlo also emerged as a common change factor toward *action*. For example, many community members discussed having started to use water treatment products after attending a community meeting conducted by Gadyen Dlo agents or water technicians. Many communities dismissed people who refused or neglected to use water treatment as not understanding because they had missed the trainings. The reason that I have placed this particular change factor as leading to *action* instead of *awareness* is that the people who are described as neglecting to treat their water already know about water treatment products in the community and have a general knowledge of what water treatment products are purported to do (hence, they have achieved *awareness*), but refuse to take *action*.

## **(II) Barriers to Change**

The change factors that lead to the *action* stage on the behavior continuum are largely at the individual level and require an individual to make a choice to do try, buy or use HWT. However, barriers to this change can occur at multiple levels from individual to relationship to community. Similar to the *awareness* change factors, barriers to the *action* change factors are

often directly related to the change factors themselves. For example, in order for a community training/mobilization to serve as a change factor for *action* a person needs to choose to both choose to participate and then choose to use the product they learned about. Barriers to this can occur at the individual level, i.e. a person may choose not to attend a meeting or not to use a product that was given to them for free. They can also occur at the relationship level. An example of this are the people who call water treatment users names or tell them “ou gen tan” (“you have extra time on your hands”). If a person feels like they are being judged, they may also choose not to take *action* after the training. Finally, barriers can occur at the community level, i.e. if Gadyen Dlo (or equivalent HWT program) does not work in your community, you will not be able to make the decision to attend a training. Additionally, if products are not available in your community you will also be unable to take action. It is important to recognize that barriers can occur at all levels in this stage so that they can be properly addressed by HWT interventions.

### **(C) Maintenance**

#### **(I) Change Factors**

The *maintenance* stage on the continuum of household water treatment behavior change is only achieved after a person incorporates household water treatment behaviors into their life in such a way that it represents high adherence or “correct, consistent and sustained use”(Brown & Clasen, 2012, p. 2). The literature not only highlights the challenges of achieving adherence in household-level water treatment(Dupas, 2012; Wood et al., 2012), but it also highlights how important adherence may be to ensuring positive health outcomes (Brown & Clasen, 2012). (Dupas, 2012) even doubts the appropriateness of household water treatment interventions outside of emergency contexts due to the fact that in non-emergency settings, the inconveniences and negative effects(e.g. changing household routines, reworking household budgets, bad taste)

are immediately obvious and the positive impacts on health and productivity are something that becomes apparent over the longer-term.

Because of these factors, identifying the change agents that enable people to pass from *action* to *maintenance* is extremely important. From analysis of our FGDs, five important change agents emerged to support advancement into the *maintenance* stage of the behavior change continuum: social support, household visits, product availability, health benefits, and economic benefits. Because the barriers at this stage are very difficult to overcome, they are represented by a thicker red dotted line in the Haiti Behavior Change framework. This visually represents how barriers at this level require change agents that reach farther than the individual level. At this stage in the behavior change continuum, all of the behavior change factors are at the relationship or community level.

The first change agent is social support which emerged from our data in several forms, the first being people helping their neighbors, friends and family members through potential barriers to use. Communities discussed people lending each other products or treated water when they ran out, or encouraging neighbors to continue to treat their water even though they were experiencing negative side-effects or did not like the taste. Social support can also be more general. For example, in the case that treating your water is the community norm or the social norm among your family or friend groups.

The second very important change factor that moves people towards achieving the *maintenance* stage are household visits. While Gadyen Dlo supervisors have encouraged their distributors to attempt this technique to recruit more people to take *action* (Un-analyzed data from IDIs with community resellers, 2012), currently household visits only emerge in our data as

a change factor for *maintenance*. Household visits are an extension of social support that links the individual back to the household water treatment program. Many people talk about the motivation of being held accountable for water treatment behaviors as being an important factor for putting in the extra effort to take the time to treat water or restock water treatment product when it runs out. Others talk about how the chlorine residual test that occurs during these visits assures them of the safety of the product and the safety of the water. This is important for addressing the barriers of doubt over the safety or efficacy of water treatment products, especially in the wake of reports of people dying from accidental incorrect usage of Aquatab. Our study is in agreement with research by (Mosler et al., 2013), (Ritter, 2008) and (Wood et al., 2012) that all assert the importance of household visits in HWT adherence.

In this model product availability means that the product is not only available but that it is available at a competitive price. Product availability is an important change factor at the *maintenance* stage because in our data it is also one of the most common barriers to *maintenance* and emerged as one of the top reasons community members who have reached the *maintenance* stage regress back to *action*. People who have fallen back from *maintenance* express themselves throughout the majority of the focus group in the same way as those maintaining water treatment behaviors, but during the product ranking activity they often complain of the lack of availability of the product that they use (In this case, Gadyen Dlo) and when asked say that they are not currently treating their water. (Lantagne & Clasen, 2010) addressed the issue of availability in their paper on the sustainability of household water treatment interventions implemented in emergency settings, saying that interventions must purposively plan the supply chain of water treatment products so that they remain available in the community after the free distribution has run out. While the supply chain was relatively constant in most of the Gadyen Dlo communities,

a few expressed that their reseller did not currently have the product in stock. These supply chain issues will need to be explicitly addressed by Gadyen Dlo supervisors and should be taken into consideration by any community organization working in household water treatment.

The final two change factors, health benefits and economic benefits, will be discussed together because while they are different issues, in our focus group discussions regarding sustained use of water treatment they often went hand in hand. While illness is an important change factor in the movement between *awareness* and *action*, health benefits are important in both the movement from *action* to *maintenance*. Focus group participants who were established Gadyen Dlo users often discussed health benefits like feeling good in conjunction with economic benefits of spending less money at the clinic or the hospital. As (Dupas, 2012) discusses, health benefits and economic benefits are rarely seen in the short-term with water treatment interventions. This highlights how important it is for all of these change factors for *maintenance* to act in conjunction with each other. If water treatment behavior can be sustained through social support or household visits long enough for people to grow accustomed to the taste<sup>10</sup>, extra household tasks, and short term costs of water treatment, then people will have the opportunity to see that water treatment is less expensive than a trip to the hospital.

## **(II) Barriers to Change**

Barriers to the *maintenance* stage can also occur at the individual, relationship and community levels. For instance, a barrier at the individual level may occur if a person decides not to use HWT consistently because s/he dislikes the chlorine taste of a HWT product. At the relationship level, if a person does not receive encouraging social support from friends or household visits

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<sup>10</sup> Several focus group members discussed giving people in their social networks who were struggling with the taste or other negative effects of water chlorination to keep using it because these side effects would eventually go away.

this may serve as a barrier. The sustained individual-level behavior change required at the maintenance level is difficult without ongoing social support. Finally, barriers to *maintenance* can occur at the community level, i.e. products that people use to maintain HWT behaviors become unavailable in the community or resellers run out of stock. This would prevent someone who has made the necessary lifestyle changes unable to adhere to their HWT routines.

### **5.3.2 Impact of Distrust and Uncertainty Fueled by Cholera on Self-Efficacy**

Although participants in all regions expressed doubts about their ability to prevent themselves and their community from getting cholera, people in the rural Jolivert region were more likely to talk about knowing people who used water treatment consistently and still contracted cholera. I would also assert that the uncertainty discussed in the fear and distrust section not only impacts mental health but may impact an individual's perceived agency (self-efficacy) in the cholera prevention process. While several studies found that fear of cholera was a motivator in WASH behavior change, if a person does not feel they have the power or ability to prevent cholera, there may be little motivation to make significant changes to daily behaviors. This has significant implications for the public health response to cholera.

## **5.4 Disaster Response**

Several previously mentioned studies talk about the efficacy of household water treatment in emergency response situations in Haiti and in other contexts (Colindres et al., 2007; Dunston et al., 2001; Lantagne & Clasen, 2012). While these studies find that household water treatment can have high uptake and effective use in emergency settings, these studies do not look at the process behind emergency distribution of water treatment. Our results highlighted several big issues with the distribution of water treatment products to Haitian communities in the aftermath of the earthquake and in response to cholera that were detrimental to both perceptions

regarding water treatment products and trust in foreign aid/government. For instance, focus groups from all three regions reported people using the freely distributed product Aquatab incorrectly. Furthermore, there were a series of issues in the coordination of free distributions that likely led to wasted resources in the disaster response.

Because these focus groups were conducted in the context of cholera you could also say that recommendations made by (Lantagne & Clasen, 2012) apply directly to our findings. They recommend that in order for a water treatment intervention to be suitable for sustained use after an emergency it needs to have been both available and known in the community prior to the emergency and purposively made available following the emergency (Lantagne & Clasen, 2012).

As previously discussed in the (A) Awareness and (B) Action sections of the discussion, free emergency distributions not only made people aware of the necessity of household water treatment, it also gave them the opportunity to take *action* and learn how to use a product, but in our FGDs we found that poorly executed free distributions may have acted as barriers to achieving the next step in the behavior change continuum.

## **5.5 Recommendations**

### **5.5.1 Recommendations for WASH NGOs working in Haiti**

(1) Exercise caution and purposively address issues of distrust that are rooted in community perceptions of cholera (and the safety of emergency household water treatment product Aquatab) through active and inclusive discussion with the Haitian communities you serve. This strategy was suggested by (Grimaud & Legagneur, 2011) as one of many necessary steps to mend the relationship between aid organizations and the Haitian community in the aftermath of the earthquake and the subsequent cholera epidemic.



(2) Be positioned to not only continue to respond to the ongoing public health needs posed by the cholera epidemic, but also start planning for the next disaster. This can be achieved by:

(a) Increasing coverage and exposure to household water treatment products. Effective and sustained use of household water treatment in emergency settings increases if organizations utilize products that are already known and easily accessible in the community (Lantagne & Clasen, 2012). Increasing community awareness of correct product use will minimize accidental misuse of water treatment products in emergency settings.

(b) In light of the deaths described in our focus groups that were attributed to misunderstanding of the correct usage of Aquatab, it will also be important to strategically plan future emergency distributions of HWT products. Products should not be distributed without a full training on proper use and properly labeled safety warnings and messages regarding correct use of products. Care should be taken to ensure that correct use is properly explained to every family and that directions are provided in both the appropriate languages (Haitian-Kreyol and French) and accompanied by graphics to assist those who are illiterate. The Aquatab deaths are completely unacceptable and cannot be allowed to happen again.

### **5.5.2 Recommendations Specific to Gadyen Dlo**

(1) Gadyen Dlo is a very well-liked product. DSI should use the aspects of Gadyen Dlo product that FG participants expressed that they liked in advertisement and marketing of the product. For example, advertisements should talk about the “light and refreshing taste”, the high quality, the attractive bottle, ease of use and the advantages of the Special Bucket.

(2) Due to the finding that regardless of which HWT product a person believes is the best quality, s/he will almost always choose to use a water treatment product that is provided for free over one that is purchased, it does not make sense to aggressively push sales or marketing in areas where free distributions are actively occurring until there is word that those distributions may be coming to an end. It would be better to spend advertising money on more competitive markets, unless you were looking to raise *awareness* of your product so that it can compete when free-distributions come to an end.

(3) Gadyen Dlo supervisory staff should provide logistical training and support to its distributors so that no region is left without product. As shown in the conceptual framework, product availability is an extremely important change factor for the *Maintenance* stage of the behavior change continuum. Logistical issues that limit product availability, such as a product reseller running out of stock, should be explicitly addressed in trainings with Gadyen Dlo Supervisors and resellers.

(4) Explicitly address the trade-offs of immediate inconvenience versus long-term benefits involved in the step from *action* to *maintenance* through behavior change messaging that draws explicit comparisons between the amount of money you would spend on health care bills in the absence of water treatment to the amount of money you would spend on household water treatment.

## **5.6 Limitations**

Because we used Gadyen Dlo supervisors and resellers as gatekeepers into the community, our participants were almost exclusively Gadyen Dlo users and our study team was most likely associated with Gadyen Dlo despite a thorough study introduction and consent

process that attempted to distance ourselves from the Gadyen Dlo program itself. These factors most likely influenced the qualitative data that we collected. Furthermore, although I purposefully did not participate in the focus group discussions themselves, I did travel to the community to organize the logistics of each focus group. My presence as an outsider and as an American in the community probably impacted the candidness of responses.

The ability to incorporate the iterative process of grounded theory methodology was hindered by the fast pace of data collection, high amount of travel, lack of electricity and the fact that I did not collect the data myself. While my Research Assistant had an excellent learning curve, he did not have prior qualitative experience and may have missed opportunities to probe for further information, especially in earlier focus groups.

While we tried our best to conduct focus groups in a quiet place with minimal distractions, we ultimately did not have much control over the location that groups were conducted. The Port-de-Paix focus group was conducted in such a hot and uncomfortable building that it impacted the length and quality of the data.

Unfortunately, we were unable to link participant characteristics to the transcript and so we were unable to examine the data for differences between men and women or old and young respondents. Similarly, written documentation of the timeline and sorting activities were lost in travel, we were not able to hire a note-taker to work with the Research Assistant during FGDs, and so we had to rely on notes taken by the Research Assistant while he was also facilitating the activity.

The data itself is broad in that it covers a range of topics, but it lacks depth as the groups did not typically spend that long on any individual topic. Issues regarding a lack of direct

translation from English to Haitian-Kreyol in our focus group guides meant that we occasionally had to settle for close-ended questions. These did indeed limit our ability to gain depth of data in areas regarding what community members thought about water treatment generally.

Half of the data was simultaneously translated and transcribed which meant that some of the complexity of the original data may have been lost. Budget restraints prevented the other half of the transcriptions from being translated to English, and so I analyzed these focus groups in Haitian-Kreyol. As I am not a fluent speaker of Kreyol, it is possible that some of the meaning was lost during processes of analyzing and writing up results. Quotes included in the text were translated to the best of my ability as an intermediate-level Haitian-Kreyol reader.

## Chapter 6: Conclusion

This qualitative analysis of perceptions of cholera in Haiti, the factors influencing household water treatment –related behaviors, and the role that cholera played in the uptake and use of household water treatment in the community addresses several important and understudied topics. Results from my study indicate the cholera was a very important factor in motivating household water treatment behavior change in communities in the Jolivert, North and Léogâne program regions of Deep Spring International's (DSI). Vivid language used to describe cholera highlighted that people continue to fear cholera and worry that they will contract it. Uncertainty to cholera's origins affect people's perceived self-efficacy in that it limits their perception of agency in the prevention of cholera.

There is very little literature about perceptions about the disease of cholera as they relate to WASH-related behavior change, and even fewer that use qualitative methods and only one cholera related qualitative study in Haiti since the outbreak began in October 2010(Grimaud & Legagneur, 2011) . As this study was conducted less than two months after cholera started, my study adds findings important to assessing how and why these perceptions have or have not changed in the aftermath of investigations linking the cholera outbreak to the MINUSTAH UN Peacekeeping Force's camp in Mirebelais, Haiti. These results are important to future public health response to cholera in Haiti and also helps identify potential barriers that NGOs , international organizations and the Haitian government may face in providing services to the Haitian people due to distrust caused by cholera's uncertain origins in Haiti.

Furthermore, this study presents a framework for addressing household water treatment behavior change in Haiti which may be adapted to be applicable to other settings as well. This framework identifies the change factors necessary for an individual to move from through the

behavior change continuum presented by Path's Safe Water Program from *awareness* to *action* to *maintenance* of household water treatment behaviors and also provides guidance about what intervention level (Individual, Relationship, Community) a household water treatment organization should seek to address at different stages of the behavior change continuum.

These results can inform the work of national and international organizations in Haiti seeking to respond to the ongoing cholera outbreak or address issues regarding access to safe drinking water in Haiti. We hope that the findings from this study can also inform the work of Gadyen Dlo and other water treatment programs in Haiti, helping them increase both their coverage and reach in Haiti with the goal of reducing the percentage of Haitians that still lack access to improved drinking water (35%)(Institut Haïtien de l'Enfance & MEASURE DHS, 2012).

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## **Appendices**

### **A.1 Appendix 1 Focus Group Discussion Guides -English**

#### DISTRIBUTION STRATEGIES OF POINT-OF-USE WATER TREATMENT IN HAITI FOCUS GROUP DISCUSSION GUIDE

##### INTRODUCTION:

Hello, my name is \_\_\_\_\_. I am working with Emory University in the US which is doing a study of household water treatment Haiti. I would like to thank you all for coming today. We are conducting focus groups to better understand what people think about the ways that they can treat water in their home.

You were invited to participate in this focus group because we are particularly interested in your experience as a community member. Although we do not work for Gadyen Dlo, we will share findings of this focus group with the directors of Gadyen Dlo so that they can improve the way they distribute their product to the community. We know that everyone's time is important and so this focus group will last between an hour and an hour and a half. We will serve food and drinks during the discussion.

I would like to remind you that your participation in this focus group is completely voluntary. You are free to leave at any time and you do not have to answer any questions you feel uncomfortable with. Your individual answers are confidential, and only me, the others in this room and our research team will know what you said. Please only use first names today. We will remove names and any identifying information from the notes we take on the discussion..

At this time I would like to introduce [NAME]. S/He will be taking notes throughout our discussion, but will not be participating. S/he may ask us a few questions if she wants to clarify something that was said.

Before we begin, I'd like to lay out some ground rules for our conversation today. We want everyone to feel comfortable speaking candidly so please do not share the information that you hear in this group with anyone outside of the group. We hope that everyone can contribute to the discussion – there are no right or wrong ideas. It is also very important that we are respectful of each other while we are talking, even if we disagree. So that we are able to hear everyone clearly, please try not to speak over one another. I will let you know how you are doing at this throughout the interview.

I am very excited to speak with you about your experiences. Do you have any additional questions for me at this time?

With your permission, I'd like to record this focus group so that I don't forget what anyone has to say. Is this okay with everyone in the group?

Thanks. We will now begin with our discussion.

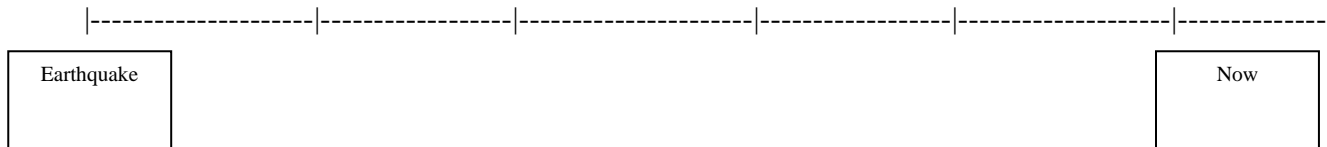
INTRODUCTIONS:

[INTERVIEWER INSTRUCTIONS PRESENTED IN BRACKETS]

Activity 1: TIMELINE(10-15)

I want to learn a little more about your community. Could you tell me about all the important events that have happened since the earthquake until today?

CHOLERA TIMELINE REFERENCE: (Show or draw out a timeline on a piece of paper)



**Thank you for telling me about important events in your community. About when would you say the cholera epidemic was the worst? Where should I put it? Before or after \_\_\_\_? I am going to put a mark on that spot** (Christmas: November-December of 2010 & Rains: June-July 2011).

Probe (to inform the following activity):

**Are you still worried about cholera in the community?**

**Is it still a problem in the community today?**

II. BELIEFS AND PRACTICES ABOUT WATER TREATMENT **BEFORE**, DURING THE PEAK OF CHOLERA AND NOW:

**I am now going to ask you a few questions about safe drinking water. I want you think about how things were before the cholera epidemic.**

[Note to Discussion Group Leader: We are trying to understand what people think about treating their water, whether they think it is important and why or why not, whether people treat their water more or less often at different times of the year and why, and whether these beliefs and practices have changed in the past few years in response to the cholera epidemic.]

- (Pointing to the timeline) **Let's start by talking about what people did before cholera came to Haiti.**
  - Before cholera came to your community, what did people in the community say about treating their water (making water safe) before they drank it? [Did they say it was important? Not important?]
  - What were you told about treating your water during that time? (Who told you?)
  - How often did people treat their water (make their water safe to drink) ? Why?
    - i. Were there certain times of year that people treated their water?
  - What did the community think were the best ways to make sure their water was safe to drink? Why? [buying water, using a certain product, boiling, SODIS?]

#### **ACTIVITY: SORTING –WATER TREATMENT USE BEFORE CHOLERA**

**We are going to use these pictures to help with our discussion today.**

**I want you to pick out the products (if any) that people used in the community before cholera came.**

[Leader: Have the group pick out the products used in the community on the pieces of paper and put them into a pile.]

**Were there any other products that people used?**

[Include any additional products that were written in. Put all the other products not mentioned away. Read aloud all the products that are in the group. ASK: “Are there any other ways people used to treat their water before cholera?” Write/draw any additional products on the blank cards].

**Thank you. End of activity.**

- How did the community know their water was safe to drink?
- [Do you think that treating water made a big difference, a little difference or no difference at all in the health of people in your community? Please tell me why you think that.]
- [Pointing to the timeline] **Now I want you to remember back to the worst of the cholera outbreak [POINT TO CHOLERA ON THE TIMELINE]**
  - During this time, what were people saying about treating their water (making their water safe) before they drank it? [Did they say it was important? Not important?]
  - What were you told about treating your water during that time? (Who told you?)

- What were the messages you received about how to prevent cholera? (Where did those messages come from?)
- How effective was water treatment in preventing cholera in your community? Did it make a difference?
- How often did people treat their water (make their water safe to drink) ? Why?
  - i. Were there certain times a year when people treated their water more often?
- What did the community think were the best ways to make sure their water was safe from cholera? Why? [buying water, using a certain product, boiling, SODIS?]

### **SORTING ACTIVITY-DURING CHOLERA**

[Put all the cards back on the table.]

**Now I want you to think about the products that people used during the worst part of cholera. Please show me the products that people used during the cholera outbreak. Were there any other products used?**

[Leader: Have the group pick out the products used in the community on the pieces of paper and put them into a pile. Include any additional products that were written in. Put all the other products not mentioned away. ASK: “**Were there any other ways people treated their water that we do not have?**” Write or draw any new ways that people mention on pieces of paper and add them to the pile. ]



[Leader: If there were any differences in the products that people named before and during cholera, then ask:]

**Why did the community start to use these products?**

**Or why did the community stop using these products?**

**Okay, now please work together as a group to put these products in order from the ones that people used the most to the ones that people used the least during the worst of cholera.**

[Allow the group time to put the pile in order from most used to least used during cholera. Remind them that we are talking about during the worst of cholera.]

**Probe: Why did people use more of this product/less of this product? [Make sure you ask about each product]**

[For the following questions, have the group pick out the answers from the pile. After they have chosen their products, read them aloud for the recording.]

**Which products or methods cost less?**

- About how much do they cost? [Make sure you get information about cost per quantity]

Example: How much water does it treat? How long does this last? How many people in your family? Etc...

**Which of products were easiest to get? Why?**

- Where did people get these products?
- How much time does it take in order to get to the place where you can get these products?

[For the following questions we want to get a sense for how free distributions affected water treatment in the community.]

**How do you think cholera changed the way people treat their water in your community?**

- Were any products given out in the community for free?
- Which products?
- How much?
- Do people still have free product in their homes?
- Who gave it out? (specifically, not just yo)
- What did the community think about the distribution?
- Are people still using this product? [whether they got it for free or now buy it]

**Thank you. End of Activity**

- How did the community know their water was safe to drink?

(Pointing to the timeline) **Now, we would like to talk about present day.**

- Do you think cholera is still a problem in your community? Are you very very afraid, a little afraid or not at all afraid that cholera will come back? Why do you think that?
- What do people in the community say about treating water (making water safe) before they drink it now? (Is it different than during cholera?)
- What messages are you hearing in the community about treating your water?
- Why do people treat their drinking water now? If they don't treat their water, why not?
- What are people doing to prevent cholera from coming back to their community?
- How often do people in the community treat their water (make their water safe) before the drink it?
  - i. Are there certain times of year that people are more likely to treat their drinking water? Why?

- How effective is water treatment in preventing disease in the community now? Why?  
Did it make a difference?
- How do people in the community know that their water is safe to drink?

**[Question may be eliminated] Now I'm going to ask you a bit about the water that people use in the community.**

- Where do most people in the community get their water...
  - 2a. for drinking?
  - 2b. for cooking?
  - 2c. for washing?
  - 2d. bathing?

### III. PRODUCT USE QUESTIONS BEFORE CHOLERA, DURING CHOLERA AND NOW:

**Now, I want to ask you a few questions about the products and supplies that people in the community use to make their water safe.**

[Discussion group leader instructions: Use the cut out pictures of water treatment products. Have a few small pieces of paper and markers to write down additional products or methods that people think of. Each product or supply should get its own piece of paper]

**PRESENT DAY :**

**Please show me the water treatment products or methods do people in the community use to make their water safe to drink today. Are there any other products that I have not shown you? Are there any products in the community now that were not used before?**

[Leader: Have the group pick out the products used in the community on the pieces of paper and put them into a pile. Write or draw any additional products that were named on blank papers. Put all the other products not mentioned away. ].

**So these are the products that you told me people use in your community [Read products]. Can you help me put these products in order from the ones that people use the most to the ones that people use the least?**

**Why did people use more of this product/less of this product? [Make sure you discuss each product]**

- What are the biggest reasons that people use [INSERT TOP PRODUCT] the most? What are the biggest reasons that you think people use [INSERT LAST PRODUCT] the least?

[For the following questions, have the group pick out the answers from the pile. After they have chosen their products, read them aloud for the recording.]

- Which products or method costs the least?
  - About how much do they cost?
  
- Which of these products is easiest to get?
  - Where do people get these products?
  - How long does it take for someone to get to where they are sold or given out?
  
- What would the community say about the quality of these products?
  - Please put the products in order from highest quality to lowest quality. Why did you put them in this order?
  - Which looks the best? Which tastes the best?

**What is the biggest reason that people do not use ANY of these products or methods to treat their water?**

#### IV. GADYEN DLO BRAND:

**Now I'm going to ask you a few questions about the water treatment product called Gadyen Dlo.**

**How have you heard about Gadyen Dlo?**

- Probe: neighbors / family / friends? radio spots? Distributors? Banners? Church? School?

**What do people say about Gadyen Dlo in the community?**[May be answered above in section III above]

**Tell me about how people get Gadyen Dlo in your community.**

**Why do people who use Gadyen Dlo choose it over other products available in the community?**

- Is Gadyen Dlo very easy, a little easy or not easy at all to find in your community? Tell me why. How does this compare to other products?
- How do you feel about the price Gadyen Dlo? How does the price of Gadyen Dlo compare to other products?

**Why do people who use other products choose to use them over Gadyen Dlo?**

**V. AREAS FOR IMPROVEMENT/CLOSING**

**\*\*Where do you think would be the best location for people to get water treatment products? (Where would they be most accessible (easy to get to)? Why?)\*\***

**What would encourage people in the community to use water treatment products to make their drinking water safe?**

**Do you have anything else you'd like to share with me today before we wrap this up?**

Thank you so much for taking the time to talk with me today. I appreciate all that you have shared with me today. Your input will be important to improving the situation in your community. Do you have any questions or concerns concerning the research we are doing?



## A.2 Appendix 2 Focus Group Discussion Guide-Haitian-Kreyol

### STRATEJI DISTRIBISYON TRETMAN DLO NAN PWEN YO

#### GID GWOUP DISKISYON

##### ENTWODIKSYON

Bonjou, mwen rele..... mwen travay pou Inivèsite Emory Ozetazini k'ap fè yon etid sou tretman dlo lakay an Ayiti. Mwen ta renmen remèsye nou tout deske nou vini jodia. N'ap menen yon gwoup diskisyon pou pi byen konprann kijan moun panse de fason yo ka trete dlo lakay yo.

Nou te envite w pou patisipe nan gwoup diskisyon an paske nou entèrese patikilyèman de eksperyans ou etan kòm yon manb kominote a. Malgre nou pa travay pou Gadyen Dlo, n'ap toujou pataje sa nou jwenn de group diskisyon sa ak direktè Gadyen Dlo yo, afen yo ka amelyore fason distribisyon pwodwi a nan kominote a. Nou konnen tan tout moun enpòtan e alò group diskisyon sa ap dire inè e inè demi. N'ap bay ti bwason ak ti goute pandan diskisyon an.

Nou ta renmen fè w sonje ke patisipasyon w nan group diskisyon a konplèman volontè. Ou lib pou w kite l nenpòt lè e ou pa dwe reponn ak tout kesyon ke ou santi w pa alèz avèk. Tout reponns endividyèl ou yo konfidansyèl, e se sèlman mwen menm, ak lòt moun ki nan chanm sa, ak ekip rechèch nou an k'ap konnen sa w te di a. Tanpri di nou non w jodia. Nap retire non yo e nenpòt enfòmasyon ki idantifye nan nòt nou pran nan diskisyon an .

Kounye a mwen ta renmen prezante[ non]. Li pral pran nòt pandan diskisyon nou an, men li p'ap patisipe, li petèt mande nou kèk kesyon si li vle klarifye kèk bagay ou te di.

Anvan nou kòmanse, mwen ta renmen prezante kèk règ pou konvèzasyon nou an jodia. Nou vle tout moun santi l alèz pou pale, tanpri pa pataje enfòmasyon ke w tande nan group sa a ak nenpòt lòt moun ki pa nan group la. Nou espere ke tout moun ka kontribye nan diskisyon an – pa gen bon e move ide. Li trè enpòtan pou youn respekte lòt, pandan n'ap pale a, menm si w pa dakò. Anfen nou kapab tande tout moun klè, tanpri pa pale pandan lòt moun ap pale. M'ap fè w konnen kòman sa mache pandan entèvyou a.

Mwen trè kontan pou pale ak nou de eksperyans ou yo. Eske nou pa gen lòt kesyon pou mwen kounye a?

Ak pèmisyon w, m ta renmen anrejistre group diskisyon an anfen m pa bliye tout sa nou te di. Eske tout moun dakò nan group la?

Mèsi, e n'ap kòmase ak diskisyon nou an kounye a.

### **ENTWODIKSYON:**

Aktivite 1: kalandriye(10-15)

Mwen vle aprann anplis de kominote ou a. Eske w ka di m tout evennman ki enpòtan depi tranbleman de tè a jiska jodia?

### **KALANDRIYE REFERANS KOLERA:( Show or desinen yon kalandriye sou yon ti moso**

**papye)**

|-----|-----|-----|-----|-----|-----|

Goudougoudou

Jodia

Mèsi deske w di m plizyè evennman enpòtan nan kominote ou a.

Kilè w ta di epidemi kolera a te pi mal? Ki kote pou'm mete sa nan kalandriye? M pral mete yon mak sou spòt (Nwèl: Novanm- Desanm of 2010; e lapli: jen- jiyè 2011.)

*Kèsyon investigasyon*

- Eske w toujou enkyete de kolera nan kominote w la?
- Eske li toujou yon pwoblèm nan kominote la?

## **II.KWAYANS E PRATIK DE TRETMAN DLO ANVAN, PANDAN RAVAJ KOLERA A**

### **E KOUNYE A:**

**Kounye a mwen pral poze w plizyè kesyon sou dlo trete. Mwen vle ou panse kouman bagay yo te ye anvan epidemi kolera a.**

[not pou lidè group diskisyon : n'ap eseye konprann kisa moun panse de trete dlo yo, si yo panse li enpòtan e poukisa, ou poukisa non, si moun yo trete dlo plis ou mwen souvan nan diferan lè nan ane a, e poukisa, e si kwayans sa yo e pratik sa yo te chanje nan kèk ane pase yo ak repons epidemi kolera a]

**(Touche kalandriye a) Ann kòmanse pale de kisa moun te fè anvan kolera te rive Ayiti.**

- Anvan kolera te rive nan kominote w la, kisa moun nan kominote w la te di sou tretman dlo yo (fè dlo a potab) anvan yo te bwè li?

- Kisa lòt moun te di w sou tretman dlo w pandan tan sa-a? (Kiyès ki te di w sa?)
- Chak kilè moun trete dlo yo( fè dlo a potab pou bwè)? Poukisa?
  - Eske genyen yon sèten tan nan ane a mount rete dlo yo?[ eske yo te di li te enpòtan? ou pa enpòtan]
- Kisa kominote a te panse ki te meyè fason pou w asire dlo yo te bon pou bwè? Poukisa? (achte dlo, itilize kèk pwodi, bouyi, SODIS?)

### **AKTIVITE DA TRIYAJ. ITILIZASYON ANVAN E DEPI KOLERA:**

**Nou pral itilize foto sa yo pou ede ak diskisyon nou yo jodia.**

**Kounye a nou pral retounen nan kalandriye nou an. Mwen vle ou montre yon nan pwodwi (si genyen l) ke moun yo te itilize nan kominote a anvan kolera te rive**

[lidè: fè gwoup montre pwodwi itilize nan kominote a nan yon moso papye e mete yo nan yon pil].

**Eske pa gen lòt pwodwi ke moun yo te konn itilize?**

[enkli lòt pwodwi ki te ekri yo. mete tout lòt pwodwi ki pa mansyone yo akote. li tout lòt pwodwi yo ki nan gwoup la,mande:" eske pa gen lòt fason moun te konn trete dlo anvan kolera?" ekri/desinen nenpòt lòt pwodwi nan kat blanch la]

**Mezi. Activite fini.**

- Kijan moun nan kominote a te konnen dlo yo te bon pou bwè?

- eske w kwè treman dlo te fè yon gran diferans / yon ti diferans/ gwo diferans, / okenn diferans pou lasante nan kominote a?

**di m pukisa ou panse sa?**

**(Touche kalandriye a) Kounye a mwen vle w sonje lè kolera a te pi mal la [TOUCHE**

**KALANDRYE KOLERA A]**

- Pandan tan sa-a, kisa moun te di sou tretman dlo yo (pou trete dlo yo) anvan yo te bwè l? Eske yo te di li enpòtan? Ou li pa't enpòtan?]
- Kisa w yo te di sou tretman dlo pandan tan sa-a? (Ki moun ki te di w?)
- Ki mesaj ou jwenn sou fason pou w fè prevansyon pou kolera nan kominote w la? Kote mesaj sa yo te sòti? Eske sa te fè diferans ou pote chanjman?
- Eske w kwè treman dlo fè yon gran diferans / ou isinon yon ti diferans/ gwo diferans, / okenn diferans nan prevansyon kolera nan kominote a?

**Di m pukisa ou panse sa?**

- Chak kilè moun te trete dlo yo (fè trete dlo yo pou bwè)? poukisa?
- Eske genyen youn peryòd de tan nan ane a moun trete dlo pi souvan?
- Kisa kominote a te panse ki te meyè mwayen pou asire dlo yo te pwoteje kont kolera? Poukisa? [achte dlo, itilize lòt pwodwi, dlo bouyi, SODIS?]

**AKTIVITE DA TRIYAJ PANDAN KOLERA.**

[ Mete tout kat yo sou tab la]

**kounye m vle w panse ki pwodwi moun yo te itilize pi plis lè ravaj kolera. Kounye a tanpri montre ki pwodwi ke moun yo te itilize pandan kolera. Eske pa't genyen lòt pwodwi yo te itilize?**

[lidè: fè group la ramase pwodwi yo te itilize nan kominote a sou moso paye e mete yo nan yon pil. enkli lòt pwodwi ki ekri a. Mete tout lòt pwodwi ki pa mansyone la akote. MANDE:"Eske pa gen lòt mwayen yo trete dlo yo ke nou pa genyen la? Ekri ou desinen nenpòt nouvo fason ke moun ka mete l sou yon timoso papye e adisyone yo nan pil la.]

[Lidè: Si genyen diferans nan pwodwi yo itilize pandan ravaj kolera ak say o te itilize anvan, MANDE:

- Poukisa kominote a te kòmanse itilize pwodwi sa yo?
- ou poukisa kominote a kanpe itilize pwodwi sa yo?

**oke, kounye tanpri travay ansamb an group pou mete pwodwi sa yo an lòd de pwodwi yo plis itilize rive nan pwodwi moun yo itilize mwens yo pandan kolera t'ap fè ravaj la.**

[Not: bay group la tan pou mete pil la en òd de sa yo itilize mwens pandan kolera a. fè yo sonje ke n'ap pale lè kolera te pi mal la]

**Poukisa moun yo te itilize pwodwi sa pi plis / itilize l mwens?**

[pou lòt kesyon, fè group la pran kesyon yo nan pil la. aprè fè yo chwazi pwodwi yo a, li yo fò pou anrejistreman an. Asire ke nou pale de tout pwodwi ki mansyone yo.]

### **Ki pwodwi ou metòd te koute mwens?**

- Konbyen pwodwi a koute? (jwenn enfòmasyon sou kantite pwodwi a / kantite dlo ki trete)

### **Ki pwodwi ki te pi fasil pou jwenn? Poukisa?**

- Ki kote moun yo te jwenn pwodwi sa yo?
- Konbyen tan pou yon moun rive kote li ka jwenn pwodwi sa yo?

[pou kesyon anba yo nou vle jwenn ide kijan distribisyon tretman dlo a gratis la te afekte kominote a.]

### **Kijan w panse kolera chanje fason moun yo trete dlo nan kominote ou a?**

- Eske pa te gen lòt pwodwi yo te bay gratis nan kominote a?
- Ki pwodwi?
- Ki kantite?
- Eske moun yo toujou genyen pwodwi gratis lakay yo?
- Kiyès ki te bay yo? (jwenn plis enfòmasyon ke “yo”)
- Kisa kominote a te panse de distribisyon?
- Eske moun yo toujou ap itilize pwodwi sa yo? (ni jwenn gratis oswa achte)

### **Mezi. Aktivite fini.**

- Kijan moun kominote a te konnen dlo yo te bon pou bwè?

**(Touche nan kalandrye) Kounye, m ta renmen pale de kounye a. Eske w pa kwe kolera se toujou yon pwoblèm nan kominote ou a?**

- Eske moun yo enkyete ke kolera ka tounen / eske w pè anpil anpil ou tou piti piti, ou pa pè ditou ditou ke kolera ke kolera ka tounen? di mpoukisa ou panse sa?
- Kisa moun ki nan kominote a di kounye a sou tretman dlo (trete dlo) anvan yo bwè li? (Eske li diferan ke pandan kolera a?)
- Ki mesaj ou tande nan kominote a pou tretman dlo w?
- Kisa ki fè moun trete dlo yo kounye a? Si yo pa trete, poukisa yo pa trete?
- Kisa moun yo fè pou anpeche kolera tounen nan kominote yo a?
- Chak kilè moun nan kominote w la trete dlo yo? (fè dlo a bon) anvan yo bwè li?  
POUKISA.
- Eske w kwè treman dlo fè yon gran diferans / ou isinon yon ti diferans/ gwo diferans, / okenn diferans nan lasante nan kominote a?  
Di m poukisa ou panse sa?
- Kijan moun man kominote a konnen dlo yo bon pou bwè?



**[Kesyon an petèt elimine] Kounye a m'ap mande w ki dlo moun itilize nan kominote a.**

- Ki kote majorite moun nan kominote a pran dlo?

2a. pou bwè?

2b . pou fè manje?

2c. pou lave?

2d. pou benyen?

### **III. KESYON SOU PWODWI ITILIZE A PREZAN**

#### **A PREZAN:**

**Tanpri montre pwodwi tretman dlo ou metòd nan kominote a pou fè dlo a bon pou bwè kounye. Eske pa gen lòt pwodwi ke mwen pa montre? Eske pa gen lòt pwodwi ki nan kominote a kounye a ki pa't la anvan?**

[lidè: fè moun yo retire pwodwi ki te itilize nan kominote a sou yon fèy paye e mete yo nan yon pil. Ekri / desinen nenpòt lòt pwodwi yo pa't di sou fèy blanch. mete tout lòt pwodwi ki pa mansyone a akote.]

**Alò pwodwi ke w te di m moun yo itilize nan kominote w [li pwodwi yo]. Eske w kapab ede m mete pwodwi sa yo an lòd de sa moun yo itilize pi plis rive nan sa yo itilize mwens?**

## **Poukisa moun yo itilize pi plis pwodwi sa? pwodwi sa-a mwens?**

- **Ki pi gwo rezon ki fè moun itilize l [mete meyè pwodwi a] pi plis? Ki pi gwo rezon ke w panse ke moun itilize [METE DENYE PWODWI] mwens?**

[Not: Pou lòt kesyon yo, fè moun yo pran repons lan nan pil la. Aprè ke yo chwazi pwodwi yo, li yo fò pou anrejistreman.]

- Ki pwodwi ou metòd ki koute mwens?
  - Konbyen li koute? (jwenn enfòmasyon sou kantite pwodwi a / kantite dlo li trete)
- Ki pwodwi ki te pi fasil pou jwenn? Poukisa?
  - Ki kote moun yo te jwenn pwodwi sa yo?
  - Konbyen tan pou yon moun rive kote li ka jwenn pwodwi sa yo?
- Kisa moun yo di sou kalite pwodwi sa yo?
  - Mete pwodwi yon an lòd de pi bon kalite rive nan pi mal kalite. Esplike poukisa ou mete yo nan lòd sa.
  - Kilès ki bèl? Kilès ki gen pi bon gou?
- Ki pi gwo rezon ki fè moun yo pa itilize pwodwi yo ou metòd yo?

## **IV. MAK GADYEN DLO:**

**Kounye mwen pral mande kek ti kesyon sou tretman pwodwi yo rele Gadyen Dlo.**

### **Kijan ou te tande pale dGadyen Dlo?**

- kesyon envestigasyon: vwazen /fanmi/ zanmi/ piblisite radio/distribitè / afich/ legliz?  
lekòl?
- kisa moun yo di sou Gadyen Dlo nan kominote a? (petèt ka reponn nan seksyon III  
anwo a)

### **Di m kijan moun yo jwenn Gadyen Dlo nan kominote ou a.**

### **Poukisa moun ki itilize Gadyen Dlo chwazi itilize l sou lòt pwodwi ki disponib nan kominote a?**

- Eske Gadyen Dlo fasil pou jwenn. anpil anpil,tou piti, pa fasil pou jwenn
- di m poukisa?
- Kòman ou wè pri Gadyen Dlo a?
  - Kòman pri Gadyen Dlo konpare ak lòt pwodwi yo?

### **Poukisa moun ki itilize lòt pwodwi yo chwazi itilize yo sou ke Gadyen Dlo?**

## **V. IDE POU AMELYORE / FÈMEN**

**\*\* K ikote ou panse ki ta meye kote pou moun jwenn pwodwi pou trete dlo a?**

**(Ki kote ki pi aksesib pou moun yo? Poukisa?)\*\***

**Ki sa ki tap ankouraje moun nan kominote a pou itilize pwodwi tretman dlo yo pou fè dlo y'ap bwè bon?**

**Eske nou pa gen lòt bagay nou vle pataje jodi a?**

Mèsi anpil pou ti tan an ou pase ap pale ak mwen jodia. Tout sa ou pataje avèk nou enpotan pou nou ka avanse sitiyasyon nan kominote a. Eske ou gen lòt kesyon ou enkyetid konsènan etid nou an?

## **A.3 Appendix 3 In-Depth Interviews**

### **A.3.1 In-Depth Interview Methods**

#### **3.1 In-Depth Interview Methods Overview**

IDIs with agents, resellers and technicians that worked with Gadyen Dlo were used to learn about individual motivating factors for working with the Gadyen Dlo program, the contextual barriers and challenges to fulfilling their role with Gadyen Dlo, and strategies for success. Gadyen Dlo agents, technicians and resellers themselves drove the data collection process. This qualitative methodology allowed a space for findings to arise that were not necessarily anticipated by the researcher or DSI supervisory staff. Qualitative data collection occurred in the Jolivert, North Parish and Léogâne programs between June 6<sup>th</sup>, 2012 and July 19<sup>th</sup>, 2012. During this time we collected 30 IDIs with Gadyen Dlo agents, technicians and resellers. The knowledge gained through these In Depth Interviews will be summarized to inform the ways the product is distributed in the community and create strategies to improve the experiences and performance of the the people in charge of providing the product to the community.

#### **3.2 Study Sites**

The study was conducted in communities surrounding DSI's Gadyen Dlo programs in Léogâne, Jolivert and the North Parish programs (see Figure 3). The study did not involve DSI's Parish programs operating in the Ouest or Sud-est departments. The aim of the study was to understand the perceptions of two distinct groups of people in each of the Gadyen Dlo program regions: (1) members of the communities in which DSI operates its Gadyen Dlo programs and (2) technicians, agents or resellers who work with Gadyen Dlo in each of these program sites.

However, only FGDs will be discussed in the methods section. Please see the appendix for additional information regarding IDIs. Gadyen Dlo program supervisors assisted in the recruitment of FGD participants. Specific recruitment strategies and domains of interest will be discussed in greater detail in the following paragraphs.

### **3.3. Participant Recruitment**

Supervisory staff of the Jolivert and North Parish Programs assisted with the recruitment of of IDI participants. In the Jolivert region, twenty-one GD agents and resellers from different communities were selected to participate in IDIs based on whether they worked in a mountain village, in a village along major route, or in a larger town/city as well as whether they operated in a community where they sold the product and received compensation to conduct weekly household visits, a community where they sold the product and a technician from Jolivert conducted household visits, or in a community where they only sold the Gadyen Dlo product. The goal was to recruit enough participants from each of these categories to be able to make comparisons and draw conclusions about differences between these location types and sales/distribution models. In the North Parish program, supervisory staff helped to recruit nine Parish technicians from five different communities who had transitioned to working with Gadyen Dlo after DSI took over management of the NGO Gift of Water's operations in 2008. DSI program supervisory staff decided not to conduct IDIs with GD agents working in Léogâne because they would request extra compensation for their time. All participants lived within a three hour travel radius by moto from program offices in Jolivert and the North Parish programs. Interviews were scheduled in locations that were deemed to be the most convenient for participants while still being cost-effective for the research team. Efforts were made to meet the participants in their community or a nearby community where possible. When travel was

required to get to an interview, participants were provided compensation for travel expenses and a small food stipend if appropriate.

### **3.4. Instrument Development and Field Staff Training**

Focus Group Discussion (FGD) and In-Depth Interview guides were developed in Atlanta, Georgia based on discussions with DSI Executive Director Michael Ritter and technical experts from the CDC conducting WASH research in Haiti in the months preceding fieldwork. After arrival in Haiti, the guides were reviewed and revised to include a other topics of interest to DSI program supervisors. A bilingual Haitian research assistant translated the guides from English into Haitian-Kreyol. Michael Ritter, the DSI Executive Director, verbally back-translated the guides and inconsistencies were marked and corrected with the assistance of the bilingual Haitian research assistant. The guides were piloted in Jolivert, Haiti and further revised. The Haitian research assistant was integral to refining the guides to be culturally appropriate and convey the intended meaning. Guides were revised using the iterative process throughout data collection to ensure that questions were understood in the way that they were intended and that the study team was able to explore new ideas that were emerging from the data.

A bilingual English/Haitian-Kreyol Research Assistant was hired to conduct all interviews and focus group discussions in Haitian-Kreyol. The Research Assistant completed a four-day training on qualitative research methods including active listening, in-depth probing, proper management of focus group participant personalities, note-taking, and transcription. He also completed training on ethical considerations in qualitative research and properly obtaining consent. He then conducted two pilot interviews and one pilot focus group under the supervision of the DSI Executive Director who is fluent in Haitian-Kreyol. The DSI Executive Director met

with the Primary Investigator and Research assistant to review the pilot interviews and focus groups with a focus on refining the question guides and providing constructive feedback to sharpen qualitative research skills such as probing and eliciting participation from all group members. Because the pilot participants were consented in the same way as all other participants, data from the two pilot interviews and group discussion were included in final analysis. Active support was provided to the Research Assistant throughout the research process to ensure the quality of data being collected.

It was determined that participants would be more comfortable and the flow of the conversation would be more natural if conducted by a native Haitian without the Primary Investigator present. While the Primary Investigator travelled with the researcher to all study sites, the Research Assistant conducted all FGDs and IDIs in the local language of Haitian-Kreyol by himself except in the case of Interview 8 conducted on June 18<sup>th</sup>, 2012 and Focus Group Discussion 6 conducted on June 26<sup>th</sup>, 2012 where the Primary Investigator was invited by participants to participate in the discussion. The presence of the Primary Investigator in these settings may have influenced the participant responses in these cases. Although the study received a letter of non-research determination by the Emory IRB, verbal consent for participation and recording was obtained before each interview or focus group. With the participants' permission, interviews and group discussions were electronically recorded. The Research Assistant conducted the interviews and focus groups and simultaneously took notes on the discussion.

### **3.5 Field Work & Data Collection**

#### **In-Depth Interviews (IDIs):**



Because of the geographic distance between agents/resellers and issues surrounding privacy of the information being shared, IDIs were most appropriate to gather information from agents/resellers. IDIs allowed resellers and agents to share information freely without fear that their candid comments would be shared with supervisors and impact their ability to work with the organization. In a few instances, group interviews were used with permission of the agents and employees. In-Depth Interview (IDI) guides facilitated the sharing of feedback surrounding the program from Gadyen Dlo agents, technicians and resellers who were ultimately responsible for its implementation in the field.

IDI guides were structured to gain information on the following topics specific to agents and resellers: becoming part of the Gadyen Dlo program, the process of household visits, challenges in fulfilling their role as Gadyen Dlo agents and resellers, strategies for success, motivations for working with Gadyen Dlo, and suggestions for program improvement. The IDI guides also included topics meant to complement and corroborate information gathered in FGDs such as how cholera affected sales, use of Gadyen Dlo and other products in the community, and the decision-making process of community members surrounding choice of water treatment product used. Guides were semi-structured with built-in question probes for guidance. The Research Assistant was trained to follow the guide loosely and to insert his own probes when appropriate, although independent probing was not often used. All Interviews were conducted in Haitian-Kreyol solely by the Haitian Research Assistant as we determined participants would be more comfortable talking one on one with a Haitian interviewer and to allow the conversation to flow in a natural manner. Exceptions were made for training purposes in the two pilot interviews in Jolivert that were supervised by DSI Executive Director and for Interview 8 conducted on June 18<sup>th</sup> in a Jolivert community when the participant invited the Primary Investigator to join the

conversation. Involvement of the American Program Director and Primary Investigator may have affected the responses of participants.

Interviews lasted about an hour but ranged from under 40 minutes to about an hour and a half. Interviews took place in a variety of localities both in community spaces such as a church or school or outside private residences depending upon the resources available in the community. Efforts were made to find an indoor or outdoor space that offered privacy, was free of distractions and relatively quiet. All participants received a brief explanation of the study and consented to participate as well as to have their interview electronically recorded. IDI participants were offered a drink and snack during the interview. Participants who travelled for the interview were given a stipend to cover the cost of a moto taxi and meal away from home. Gadyen Dlo supervisory staff provided information regarding the appropriate amount of compensation.

The Haitian research assistant recorded all interviews electronically and took written notes on participant responses. After each interview, the Investigator and Research Assistant met to review the interview notes in English. Notes taken during these meetings were used to inform revision of the IDI guide, identify new themes or topics of interest and supplement transcriptions. All the interviews were transcribed verbatim in Haitian-Kreyol from the electronic recordings by the Research Assistant.

### **3.5 Data Storage**

All data was stored in a password protected file and backed up into two locations: a password protected flash drive and a password protected virtual drive on the Emory University network. Audio recordings of IDIs were stored on a laptop in a password protected file and backed up into two locations: a password protected flash drive and a password protected virtual

drive on the Emory school network. All names and identifying information were removed from the IDIs transcriptions. Name of IDI participants were stored in a separate password protected file on the laptop and flash drive apart from transcriptions and recordings.

### **3.6 Analysis**

As previously mentioned the 30 IDIs were not formally analyzed for the purposes of this thesis, but were used to contextualize the FGDs that were used in the qualitative analysis for this thesis.

### **A.3.2 In-Depth Interview Discussion Guide-English**

#### DISTRIBUTION STRATEGIES OF POINT-OF-USE WATER TREATMENT IN HAITI IN DEPTH INTERVIEW GUIDE

##### INTRODUCTION:

Hello, my name is \_\_\_\_\_. I am working with Emory University in the US which is doing a study of water treatment in Haiti. I would like to thank you for coming today. \*We are interviewing multiple people who distribute Gadyen Dlo. We want to understand what works, what doesn't work and how we can help Gadyen Dlo improve its programs. \*

You were invited to participate in this interview because we are particularly interested in your experience as a distributor of the water treatment called Gadyen Dlo. We will share findings from our collection of interviews with the directors of Gadyen Dlo , \*but we will not share your name or what you say individually unless you would like us to. \* We know that your time is important, so this interview will only last **about an hour**. We will serve drinks and snacks after the meeting is over.

I would like to remind you that your participation in this interview is completely voluntary. You are free to leave at any time and you do not have to answer any questions you feel uncomfortable with. Your individual answers are confidential, and only me and our research team will know what you said. \*We will remove your name and any information that points to you from our interview notes. \*

With your permission, I'd like to record this interview so that I don't forget anything important that you say. Is that okay with you?

Thanks. We will now begin our interview.

## WARM-UP

Before I get into the main part of my questions, I would like to get to know you a little bit better.

- 1) How long have you lived in this community?

Jolivert/Parish section:

- 2) What do you do for a living?

Probes:

2a. IF THEY JUST SAY "I SELL GADYEN DLO" ASK: What other activities do you do to make a living?

- 3) What other roles do you have in the community?

## DISTRIBUTION QUESTIONS:

- 4) How did you start selling for (working with) Gadyen Dlo? Explain.

Probes:

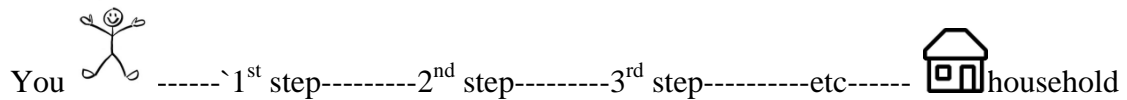
- a. How did you become integrated in the Gadyen Dlo program?

- b. How long have you been working with Gadyen Dlo?
  - c. What did you do before selling Gadyen Dlo? (ie. Work for a clinic, work for an NGO, etc)
  - d. Why did you choose to sell Gadyen Dlo?
  - e. Do Gadyen Dlo sales contribute to the money you make?
- 5) What do you currently do for Gadyen Dlo?
- 6) How many people are you currently distributing Gadyen Dlo to?
- 7) How do people find out about Gadyen Dlo in the community?
- 8) How do people in the community get Gadyen Dlo from you?
- 9) Why do people buy Gadyen Dlo from you?

Probes:

9a. Where do you sell Gadyen Dlo? (market? Public spaces?)

10) Explain what you do to start selling Gadyen Dlo to new families? Take me through the process.



Probes:

10a. How do you identify a new family (client, beneficiary)?

10b. How do you introduce yourself/the product?

10c. What do you do for families that have already bought Gadyen Dlo to make them buy multiple times? How do you keep the family as a repeat customer (client, family, beneficiary)?

11) Tell me about how you do a household visit. What is the first step? Second step? Etc.

Probes:

11a. How do you decide whether or not to take your gallon of Gadyen Dlo with you during household visits? Translation: How do you decide if you walk with your bottle of chlorine or not when you are doing household visits?

More specific probes:

- Why do you choose to take/not take Gadyen Dlo with you?
- Do you think it works to bring Gadyen Dlo with you? Why?
- How do you think bringing your gallon of chlorine changes your sales?

IF THEY DO NOT TAKE THE GALLON WITH THEM

- What do you do to sell instead of that?

IF THEY TAKE THE GALLON WITH THEM

- What is your best estimate of the percentage of people who purchase Gadyen Dlo during household visits?
- What is your best estimate of the percentage of people who come to you to purchase Gadyen Dlo (not during a household visit)?



## PRODUCT CHOICE QUESTIONS

12) How do you think people in the community decide what water treatment product or method to use?

Probes:

12a. What other water treatment products do people use in the community? (what are the names of the products?)

12b. **WHY** do you think they choose X product over Gadyen Dlo?  
(advantages?)\*\*

Further Probes:

- What do families think are the advantage(s) of this product over Gadyen Dlo?
- How do they get X product?
- Where do they get X product?

- How long do they have to travel to get X product?
- How much do they pay for these products?

12c. **\*\*What do you think people believe are the disadvantages of Gadyen Dlo? (Why do people choose not to use Gadyen Dlo?)\*\***

Further probe:

- What product do they use?

12d. **\*\*Why do you think people choose to use Gadyen Dlo over these other products?\*\*(what are the advantages of Gadyen Dlo?)**

## THE EFFECT OF CHOLERA ON WATER TREATMENT AND SALES

13) How has the cholera outbreak changed the ways that people treat their water in the community?

Probes:

13a. What did people use before the outbreak?

13b. What do they use now?

13 c. How have your sales of Gadyen Dlo changed since the outbreak of cholera ?

WHY?

Probes:

- Were there any free distributions of household water treatment products since the start of the cholera outbreak?
- What products?
- How much did families receive?
- How much do they still have?
- Who distributed? ( not just yo)

CHALLENGES QUESTIONS:

14) How do you think the Gadyen Dlo program is going?

15) What are the main challenges to selling Gadyen Dlo to the community? (Reword?: If you had to name the biggest challenge to selling Gadyen Dlo, what would you say it is?)

16) How have you dealt with these challenges? (What are strategies you have used to overcome these challenges)

17)How do you think sales are going in the community?

Probes:

17a. Why do you think that?

17b. Are you satisfied with your sales? Why? Why not?

18) What do you think is the best way to make sure people buy Gadyen Dlo?

Probes:

18a. What is a specific example?(May need good probing. We want specific examples)

18b. Tell me some specific things that you or Gadyen Dlo has done that have increased sales of Gadyen Dlo.

18c. What has been most effective in encouraging people to buy Gadyen Dlo?

18d. What have you or Gadyen Dlo tried that has not worked to increase sales of Gadyen Dlo.

\*\*18e. If you had to pick one most important thing that Gadyen Dlo could do to encourage families to treat their water with Gadyen Dlo, what would it be?\*

WARM DOWN:

19) What interests you in selling Gadyen Dlo?

20) Jolivet: What advice would you give someone who was starting to work with Gadyen Dlo as a reseller? (adapt to local situation)

Parish programs: What advice would you give to technicians in other communities?

Leogane: What advice would you give to health agents in other communities?

CLOSING:

Thank you so much for taking the time to talk with me today. I appreciate all that you have shared with me today. Your input will be important to improving the situation in your community. Do you have any questions or concerns concerning the research we are doing?

### **A.3.3 In-Depth Interview Guide-Haitian-Kreyol**

#### **STRATEJI DISTRIBISYON TRETMAN DLO NAN PWEN YO**

#### **GID ENTÉVYOU**

#### **ENTWODIKSYON**

Bonjou, mwen rele..... mwen travay pou Inivèsite Emory Ozetazini k'ap fè yon etid sou tretman dlo an Ayiti. Mwen ta renmen remèsye nou tout deske nou vini jodia. N'ap menen yon entèviyou pou pi byen konprann kijan moun panse de fason yo ka trete dlo lakay yo.

Nou envite w pou patisipe nan entèviyou a paske nou entèrese de eksperyans ou etan kòm distribitè de tretman dlo ki rele Gadyen Dlo. Malgre nou pa travay pou Gadyen Dlo, n'ap toujou pataje sa nou jwenn de group sa ak direktè Gadyen Dlo yo, afen yo ka amelyore fason distribisyon pwodwi a nan kominote a. Lè nou pataje rezilta yo, nou pap di okenn moun sa ou te di, ke se ou ki te di li. Nou konnen tan tout moun enpòtan e alò entèviyou sa ap dire inè anviron . N'ap bay bwason e ti goute lè rankont la fini.

Nou ta renmen fè w sonje ke patisipasyon w nan entèviyou a konplèman volontè. Ou lib pou w kite l nenpòt lè e ou pa dwe reponn ak tout kesyon ke ou santi w pa alèz avèk. Tout reponns endividyèl ou yo konfidansyèl, e se sèlman mwen ak ekip rechèch nou an K'ap konnen sa ou te di nou. Nap retire non ou e nenpòt enfòmasyon ki kapab idantifye ou nan nòt entèviyou a.

Ak pèmasyon ou, mwen ta renmen anrejistre entèviyou a, afen pou m pa bliye tout sa enpòtan nou te di. Eske ou dakò ak sa?

Mèsi nou pral kòmanse ak entèviyou a.

EKRI NIMERO PATISIPAN AN:

LÈ KÒMANSE:

LÈ FINI:

**CHOFE KÉSYON:**

Anvan m antre nan vrè pati kesyon m yo, mwen ta renmen fè yon ti konesans ak ou.

- Depi konbyen tan w'ap viv nan kominote a?

Jolivè/ seksyon pawas: ki sa w fè pou w viv?

*Kèsyon investigasyon*

- SI YO DI " MWEN VANN GADYEN DLO" MANDE: Ki lòt aktivite ou fè pou w viv?
- ki lòt wòl ou yo okipe nan kominote a?

**KESYON DISTRIBISYON:**

Kijan ou te kòmanse vann pou( travay ak) Gadyen Dlo?

*Kèsyon investigasyon*

- Kòman ou te fè entegre nan pwogram Gadyen Dlo?
- Depi konbyen tan w'ap travay pou Gadyen Dlo?
- Kisa w te fè anvan w te vann Gadyen Dlo? (exanp. travay nan klinik, travay pou ONG, etc)
- Poukisa ou te chwazi vann Gadyen Dlo?
- Eske vant Gadyen Dlo kontribye nan kòb ou fè?



Kisa w fè kounye a pou Gadyen Dlo?

Pou konbyen moun kounye ou fè distribisyon Gadyen Dlo ?

Kòman moun fè konnen Gadyen Dlo nan kominote a?

Kòman moun yo jwenn Gadyen Dlo nan men ou?


Kisa ki fè moun achte Gadyen Dlo nan men w?

*Kèsyon investigasyon*

- Ki kote ou vann Gadyen dlo? (pandan vizit a domisil, lakay ou, nan mache, plas piblik?)
- Ki jou ou vann Gadyen Dlo? Ki jou ou vann pi plis?

Esplike m ki sa ou fè pou komanse vann Gadyen Dlo pou yon nouvo fanmi. (Esplike m etap pa etap).



ou .....1st premye etap.....dezyèm etap.....twazyèm etap.....etc..... nan kay

*Kèsyon investigasyon:*

9a. kijan ou idantifye nouvo fanmi (kliyan, benefisyè)?

9b. kijan ou prezante w/ prodwi a?

Kisa ou fè pou fanmi ki achte deja pou fè yo toujou kontinye achte plizyè fwa (kliyan, fanmi, benefisyè)?

Di m etap pa etap kijan ou fè vizit a domisil. Ki premye etap la? dezyèm etap? etc.

*Kèsyon investigasyon*

- kijan ou deside si ou mache ak galon klorin ou non pandan wap fè vizit a domisil?

*Plis kèsyon investigasyon*

- poukisa w chwazi pote Gadyen Dlo, ou non?
- Eske ou panse pote galon Gadyen Dlo sa mache byen?
- Koman ou panse pote galon chanje vant Gadyen Dlo?

*Plis kèsyon investigasyon:*

- Eske ou panse pote galon fè ou vann plis?

SI YO **PA** POTE GALON AK YO:

- Ki sa w fè pou vann olye de sa?

SI YO POTE GALON AK YO:

- Ki meyè estimasyon de pousantaj moun ki achte pandan vizit a domisil yo?
- Ki meyè estimasyon de pousantaj moun ki vini bo kote w pou achte Gadyen Dlo? (se pa lè wale fè vizit a domisil)

### **KESYON SOU CHWA PWODWI**

Kijan ou panse moun nan kominote a deside ki pwodwi ou metòd tretman dlo pou itilize?

Kèsyon investigasyon:

- ki lòt pwodwi tretman dlo moun itilize nan kominote a? (ki non pwodwi sa yo?)
- **POUKISA** ou panse yo chwazi X pwodwi sou Gadyen Dlo? (avantaj yo?)\*\*

kesyon investigasyon profon:

- Ki avantaj fanmi yo panse jwenn sou pwodwi sa-a sou Gadyen Dlo?
- Kòman yo jwenn pwodwi X?
  - Ki kote yo jwenn li?
  - Konbyen tan li pran pou yo ale pou yo jwenn pwodwi X?
  - Konbyen yo peye pou pwodwi sa yo?
- **\*\*Ki sa moun yo panse se enkonvenyan oubyen dezavantaj de Gadyen Dlo?\*\*\***
- **\*\*Ki sa w panse fè moun yo chwazi itilize Gadyen Dlo sou lòt pwodwi yo?\*\*\***
  - Ki avantaj Gadyen Dlo genyen?

### **EMPAK KOLERA SOU TRETMAN DLO AK LAVANT YO**

Kijan arive kolera te chanje fason moun yo trete dlo nan kominote a?

*Kèsyon investigasyon:*

- Kisa moun te itilize anvan kolera te vini?
- Kisa moun itilize kounye a?
- Kijan vant Gadyen Dlo te chanje depi kolera te rive? POUKISA?

*Kèsyon investigasyon:*

- Eske pa te gen okenn distribisyon gratis pwodwi tretman dlo depi nan kòmansman kolera rive?
- Ki pwodwi?

- Ki kantite pwodwi fanmi yo te jwenn?
- Kiyès ki te fè distribisyon an? (chache plis enfòmasyon ke “Yo”)

**KESYON SOU DIFIKILTE OU GENYEN:**

Kijan w panse pwogram Gadyen Dlo a ap mache?

Ki pi gwo difikilte pou w vann Gadyen Dlo nan kominote a? (rekonpoze?: si w t'ap idantifye pi gwo difikilte pou vann Gadyen Dlo, kisa ou t'ap di li ye?

Kijan ou te jere difikilte sa yo? ( ki strateji ou te itilize pou w te travèse difikilte sa yo?)

Kijan w panse lavant lan ap mache nan kominote a?

*Kèsyon investigasyon:*

- Poukisa ou panse sa?
- Eske w satisfye de lavant ou an? POUKISA? POUKISA non?

Kisa w panse ki meyè mwayen pou w asire moun yo achte Gadyen Dlo?

*Kesyon investigasyon:*

- Ki egzanp espesifik? (petèt bezwen bon kesyon investigasyon nou egzanp espesifik)
- Di m bagay espesifik ou te fè oswa Gadyen Dlo te fè ki te ogmante lavant Gadyen Dlo.
  - Eske moun yo tande pale de Gadyen Dlo nan radyo?
  - Eske piblisite ogmante lavant Gadyen Dlo?
- Kisa ki te pi mache pou ankouraje moun pou achte Gadyen dlo.

- Kisa ou te eseye oswa Gadyen dlo te eseye ki pa't mache pou ogmante lavant Gadyen Dlo?
- \*\*Si w te ka di youn nan bagay pi enpòtan Gadyen Dlo te ka fè pou ankouraje fanmi pou trete dlo yo ak Gadyen Dlo, ki sa li ta ye?\*\*\*

### **KESYON FINAL:**

Kisa ki entèrese w vann Gadyen Dlo?

Konsèy pou lòt moun (adapte ak sitiyasyon lokal):

- Jolivè: ki konsèy ou ta bay yon moun ki te kòmanse travay pou Gadyen Dlo kòm revandè?
- Pwogram pawaz yo: ki konsèy ou ta bay ak teknisyen nan lòt kominote yo?
- Leyogàn: ki konsèy ou ta bay Ajan Sante yo nan lòt kominote yo?

Eske w pa gen lòt bagay ou te vle pataje ak nou?

### **OREVWA:**

Mèsi anpil pou ti tan an ou pase ap pale ak mwen jodia. Tout sa ou pataje avèk nou yo enpòtan pou nou espere l'ap itilize pou amelyore sitiyasyon nan kominote a. Eske ou gen lòt kesyon ou enkyetid konsènan etid nou an?