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Natalie R. LaGattuta Date

Water, Sanitation, and Hygiene (WASH) Challenges and Non-WASH Challenges Western Ugandan Women Experience Utilizing Maternal Healthcare Facilities

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Abstract

Water, Sanitation, and Hygiene (WASH) Challenges and Non-WASH Challenges Western Ugandan Women Experience Utilizing Maternal Healthcare Facilities

By Natalie R. LaGattuta

Background: Environmental conditions, such as the water, sanitation, and hygiene (WASH) infrastructure in the healthcare facilities (HCFs), have received little focus as it relates to HCF utilization among mothers. As the number of births in HCFs increase, there is a shift of attention to the quality of care and the impact of WASH conditions on mother's utilization of health services.
Methods: In March 2018, researchers from the Makerere School of Public Health, used qualitative methods to explore the WASH status in HCFs and the factors that influenced mothers' decisions for choice of delivery in the Kanungu and Rukungiri districts of Uganda. They also conducted a quantitative survey that assessed health seeking behaviors among women. This secondary data analysis was performed on data from the quantitative survey and the qualitative interviews. The quantitative analysis included generating frequency tables on sociodemographic data and performing chi square tests on HCF utilization to determine if there were any associations between non-WASH and WASH challenges experienced by mothers based on regional district or type of HCF. For the qualitative section, a thematic analysis was performed on select questions from the interviews that explored mothers' perspectives on the challenges experienced while utilizing HCFs.
Results: Overall, cost of services was the most common challenge mothers experienced in utilizing health services. For women who delivered at a public HCF, there was a difference between districts in the reporting of poor WASH services (6% in Kanungu, 0% in Rukungiri; $p=0.0285$) vs expensive services (0% in Kanungu compared to 6.2% in the Rukungiri; $p=0.0186$). Also, four themes emerged from the qualitative data that included 1) awareness of WASH challenges 2) financial challenges 3) quality of care challenges 4) resource challenges.
Discussion: The secondary analysis of the quantitative data showed a significant relationship between the regional district and the report of poor WASH services. While the qualitative analysis did not fully illuminate why mothers reported poor WASH services, it is noted that the awareness of WASH challenges in HCFs is not uniform amongst mothers. More research needs to be conducted on physical resources in developing countries to understand the challenges women experience when utilizing HCFs.

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Definition of Terms

Boreholes: hole drilled in the earth; an exploratory well (Merriam-Webster, 2019)

Cart with tank/water vendor: distribution of water by small scale vendors (SSWM, 2019)

Gravity Water: "Gravity water is in reference to water from "Gravity Flow Schemes, Gravity Flow Schemes are water sources in mountainous regions of low-income countries where water from springs in mountains is directed through pipes to a treatment system and later supplied to the targeted community"- Principal Investigator of Makerere study

Health Care Facilities (HCF): any location where health care is provided

Improved Water Source: sources that are protected from contamination, especially fecal matter, by construction or active intervention. Examples include piped household water connection, public standpipe, borehole, protected dug well, protected spring, rainwater collection (WHO (d), 2006; WHO (e), 2012)

Basic service for improved water source: "HCFs has an improved water source on site available at time of questionnaire/survey" (WHO/UNICEF JMP, 2019)

Improved Sanitation: human excreta is separate from human contact (WHO (e), 2012)

Basic service for improved sanitation: "improved latrines or toilets which are usable, separated for patients and staff, separated for women with menstrual hygiene facilities, and meet the needs of people with limited mobility" (WHO/UNICEF JMP, 2019)

Latrines: a vessel for use as a toilet (Merriam-Webster, 2019)

Mama Kits: delivery kits that mothers have to bring to the health care facility when they deliver; kit includes basin, gloves, blade, JIK (cleaning supplies), and clothes for the infant

Mixed Methods: the use of quantitative and qualitative methods in a single study

Piped water: water connection with use of pipes to facility (WHO (d), 2006)

Pit Covers: hole in ground that collects human feces

Protected dug well: method of obtaining water that is uncontaminated (WHO (d), 2006)

Protected spring: body of water that is uncontaminated (WHO (d), 2006)

Public taps/stand pipes: water connection through tap or pipes; improved water source (WHO (d), 2006)

Rain water tank: collection of rain water; improved water source (WHO (d), 2006)

Surface water: river, dam, lake, pond, stream, canal, irrigation channels (WHO (d), 2006)

Traditional Birth Attendant: supports or advises with antenatal care, aids with deliveries, provides postnatal care

Triangulated mixed methods: two or more data collections methods used in one study; merging of the data during interpretation or analysis (Creswell, 2006)

Unprotected dug well: method of obtaining water that is contaminated (WHO (d), 2006)

Unprotected spring: body of water that is contaminated (WHO (d), 2006)

Water, Sanitation, Hygiene (WASH): In this study, this refers to infrastructure that provides clean and constant water supply, basic toilets or proper waste systems, and proper infection protection control measures

WASH in HCFs:

Water- "presence of a water source or water supply in or near (within 500m) the facility for use for drinking, personal hygiene, medical activities, cleaning, laundry and cooking. Does not consider safety, continuity or quantity." (WHO & UNICEF, 2015)

Sanitation- "presence of latrines or toilets within the facility. Does not consider functionality or accessibility (e.g. for small children or the disabled)." (WHO & UNICEF, 2015)

Hygiene- “availability of handwashing stations with soap or alcohol-based hand rubs within the facility” (WHO & UNICEF, 2015)

Chapter I Introduction

Rationale

Throughout many developing countries, such as Nepal, Uganda, and Malawi, there are challenges in increasing the use of maternal healthcare services (Lama et al., 2014; Musoke et al., 2014; & Machira et al., 2018). These challenges have different root causes related to cultural, social, physical, or economic issues (Lama et al., 2014; Musoke et al., 2014; & Machira et al., 2018). A study conducted in Nepal exploring the barriers in utilization of maternal healthcare services found that culture/social factors included family pressure, superstition, health illiteracy, shyness and misconceptions about the healthcare facilities (HCFs) (Lama et al., 2014). Another study conducted in the Wakiso district of Uganda found that the most significant challenges to utilization of healthcare services were unavailability of prescription drugs and other necessary medications, cost of services, and distance to the HCFs (Musoke et al., 2014). The Uganda study also found that challenges to utilization of HCFs can be dependent on educational levels, economic factors, environmental conditions, cultural beliefs and practices, gender, political climate, sociodemographic factors, knowledge regarding healthcare facilities, and quality of service (Musoke et al., 2014).

Environmental conditions, such as the water, sanitation, and hygiene (WASH) infrastructure present in the HCFs, have received very little focus as they relate to the challenges of healthcare utilization among mothers. WASH infrastructure and services in HCFs have come to the forefront of attention in the public health field as recent reports have demonstrated significant gaps in WASH coverage in healthcare facilities globally (WHO & UNICEF, 2015). In 2015, the World Health Organization (WHO), released a broad, multi-country analysis on WASH in HCFs in developing countries. Data collected from 66,101 facilities in 54 countries

showed that 38% of HCFs do not have an improved water source, 19% do not have an improved sanitation, and 35% do not have water and soap for handwashing (WHO & UNICEF, 2015). The report also suggested an association between poor WASH infrastructure in HCFs and increased rates of healthcare associated infections, leading to higher rates of mortality (WHO & UNICEF, 2015).

Other important findings in the 2015 (WHO) report include the tendency for the definition of water services to consist of the presence of water either in or near the HCF, without noting the permanency or microbiological safety of the water (WHO & UNICEF, 2015). Further, certain districts within several countries have less access to WASH services in HCFs compared to the national average (WHO & UNICEF, 2015). Within the African Region, the supply of water was the lowest with 42% of surveyed HCFs lacking an improved water source (WHO & UNICEF, 2015). In terms of government action, according to the United Nations-Water Global Analysis and Assessment of Sanitation and Drinking-water (GLAAS) survey, only 25% of 86 countries reported a fully implemented protocol for drinking water and sanitation in healthcare facilities (WHO (h), 2014). So then, even if the HCF had access to proper water and sanitation services, without a protocol the services may not be delivered efficiently.

Without proper WASH infrastructure in HCFs, infection prevention and control (IPC) practices are often compromised (WHO & UNICEF, 2015). Poor IPC practices can then lead to complications during delivery among mothers. It has been reported that 800 women die every day from complications during pregnancy and over 70% of maternal deaths are attributed to complications during pregnancy and childbirth (WHO (g), 2016). In Uganda, the maternal mortality rate decreased over the twenty-year period of 1995-2015 from 684 to 343 deaths per 100,000 live births (WHO (c), 2018). However, many challenges are still present within the

healthcare system that includes ensuring quality of health services, stock out of medications, lack of resources, and issues motivating and retaining skilled healthcare workers, particularly in remote areas (WHO (c), 2018).

Problem Statement

The increasing number of births in HCFs has given rise to a shift of attention to the quality of care, as poor-quality care can lead to higher peripartum morbidity and mortality (WHO (g), 2016). WHO has developed a framework that includes eight domains of quality of care that should be assessed, improved, and monitored within the health system for maternal and child care (WHO (g), 2016). The Standards of Care and Quality statements are broken down into eight standards of care and 31 quality statements. Standards 1 through 7 address non-WASH factors, whereas Standard 8 specifically addresses WASH factors. Standard 8 states, "a HCF has an appropriate physical environment, with adequate water, sanitation and energy supplies, medicines, supplies and equipment for routine maternal and newborn care and management complications". However, there is very little knowledge on WASH conditions and challenges in HCFs, which makes this standard difficult to measure. There is even less information on the impact of WASH conditions on the mother's choice to utilize maternal health services.

The utilization of maternal health services varies greatly within and between developing countries (Say & Raine, 2007). Therefore, determining if women view WASH as a challenge when utilizing health services could shed light on health service utilization patterns and opportunities to address the large gaps in WASH coverage among HCFs. This rationale is the basis for this thesis research project that seeks to determine the potential relationships between WASH or Non-WASH factors in the utilization of maternal health services among women in two districts in western Uganda.

Project Context

During 2015-2016 Emory University partnered with the Uganda Ministry of Health, Care International, Assist International, and Makerere University School of Public Health to monitor donated water purification systems in six hospitals in western Uganda. In March 2018, a team of research assistants from the Makerere School of Public Health explored qualitatively the factors that influence mothers' decisions for choice of delivery place and the WASH status at HCFs located throughout the Kanunugu and Rukungiri districts in western Uganda. Research assistants also conducted a quantitative study that assessed health-seeking behaviors among women within these districts. The findings from these Makerere qualitative and quantitative studies will be the basis for this secondary data analysis.

Objectives/Aims/Purpose Statement

The major objective of this secondary data analysis of a mixed methods study will be to assess and characterize the challenges western Ugandan mothers experience when utilizing healthcare facilities for delivery. This will be done by analyzing the quantitative data set collected by Makerere University to assess the water, sanitation, and hygiene (WASH) challenges versus non-WASH challenges that Ugandan women experience in HCFs. Furthermore, analyses will be conducted to examine potential differences between the WASH status at the HCFs where mothers delivered. Lastly, analyses will be performed to examine any potential associations between WASH and non-WASH challenges and regional district or type of health care facility. The quantitative analysis will be followed up by a secondary analysis of qualitative data (in-depth interviews) to explore mothers' perspectives on the challenges experienced while utilizing HCFs.

Research Questions:

Quantitative:

1. What are the most common challenges western Ugandan mothers experience when utilizing maternal health services for delivery?
2. Is there a difference in WASH status at the HCFs mothers delivered at, based on district?
3. Is there a difference in the experience of WASH versus non-WASH challenges while delivering at a certain type of HCF (public vs private not for private vs private) based on district?

Qualitative:

1. What are western Ugandan mothers' perceptions on the WASH vs non-WASH challenges they experience when utilizing maternal health care services?

Hypotheses:

1. There is no difference in WASH status at the HCFs mothers delivered at, based on district.
2. There is no difference in non-WASH versus WASH challenges for delivery at certain HCF (public vs PNFP vs private).

Chapter II- Literature Review

Overview

The first few studies in this literature review outline the challenges to utilizing maternal child health services in developing countries, with a focus on sub-Saharan African countries, such as Uganda. These studies and reviews use multiple types of methodologies to explore not only factors affecting barriers to the utilization of services but the quality of services within HCFs in low to middle income countries (LMICs). The next section of this literature review focuses on the WHO multi-country analysis on availability of WASH services in HCFs in LMICs and a few meta-analysis reviews on environmental conditions within HCFs in LMICs. Very few research studies have assessed environmental (WASH conditions) in HCFs and how the infrastructure or WASH resources affect quality of services. The next section of the literature review focuses on the limited research of WASH challenges in HCFs and the link to maternal health outcomes. Furthermore, this section reviews the utilization and satisfaction of maternal health services among women in regard to the WASH infrastructure at HCFs. Lastly, this review will cover maternal mortality rate and WHO Standards for Improving Quality of Maternal and Newborn Care in HCFs and highlights the need for definitions, indicators, and standards across all HCFs in LMICs to improve the quality of maternal services to enable women to utilize them more.

Challenges with Utilization of Maternal Health Services throughout Sub-Saharan Africa

Ayele, Belayihun, Teji, and Ayana (2014) assessed factors affecting utilization of maternal health services in a specific district Kombolcha, in eastern Ethiopia. Their objective was to establish the prevalence of utilization of maternal health services and identify factors that affect utilization. A community-based cross-sectional survey was conducted throughout six areas

of the district. The population included 495 women of reproductive age that were randomly sampled. All women were Muslim, 95% were married, and 60% were housewives (Ayele et al., 2014). The outcome variables from the questionnaire included antenatal and delivery care services utilization, with categories of either use or nonuse, and independent variables included demographics, such as age, education, and marital status (Ayele et al., 2014). Results from the structured questionnaire found only 25.3% of women gave birth in HCFs and rural women were less likely to deliver in HCFs compared to urban women (20.9% compared to 35.9%) (Ayele et al., 2014). A strong predictor of maternal health services utilizations were the education of women and their husbands (Ayele et al., 2014). Predictors of delivering within HCFs included occupations of mothers and their husbands, education of husbands, and history of difficult labor (Ayele et al., 2014).

Machira and Palamuleni (2017) explored women's perspectives on the quality of maternal health services in Malawi. Their qualitative study consisted of six focus groups within six different HCFs throughout three administrative districts (north, middle, south regions) in Malawi (Machira & Palamuleni, 2017). Every hospital chosen for the study had access to safe motherhood information and emergency obstetric services. Each focus group had 6-12 women for a total of 58 women in the study. The mothers were recruited by a senior manager at each HCF. The topics of the FGDs included institutional and other barriers affecting their decision to use maternal health care services, the quality of maternal health services while utilizing them, and a narrative of the anticipated maternal health services from HCFs (Machira & Palamuleni, 2017). Four themes were identified from the focus group discussions. They included 1) a perceived nature of support that women received upon arriving at the HCF, defined as the different ways of reception the women the women experienced from healthcare workers, 2)

perceived quality of care in general and at prenatal, delivery, and post-natal care services, 3) perceived barriers women experience that prevent them from seeking care at maternal health services, 4) suggestions aimed at improving overall delivery services in Malawi (Machira & Palamuleni, 2017).

Elaborating on theme number two, quality of services within the HCFs, women reported concerns with the unreliable availability of medical resources, shortage of beds, congestion, and inappropriate or unethical behaviors from healthcare workers (Machira & Palamuleni, 2017). Mothers stated that they felt disrespected by HCWs if they were unable to bring their own supplies to HCFs and they received delayed response when arriving for delivery. Authors noted that the health sector is constantly underfunded in Malawi, which results in continued inadequate healthcare and shortage of medical resources and healthcare workers. Limitations of this study included the possibility that mother's responses were influenced as the interviews were conducted where the mothers received treatment and also some mothers may have been shy in disclosing information as some of the interviewers were men. (Machira & Palamuleni, 2017). This study provided insight into the challenge's women experience while utilizing maternal health services from the emic perspective.

Cheptum, Gitonga, Mutua, Mukui, Ndamuki, & Koima (2014) conducted a study assessing barriers and utilization of maternal and infant health services in Migori, Kenya for an ongoing project entitled-Maternal and Infant Survival to Health Care Advancement (MAISHA). Cross-sectional mixed methods data collection instruments included questionnaires with 446 women of reproductive age, key informant interviews with HCF in charges and community health workers, and FGDs with men and women in Migori, Kenya (Cheptum et al., 2014). The study was conducted in four rural HCFs. The average age of the women participating in the

study was 25, 80% had attained a primary education and 85.6% were married (Cheptum et al., 2014). For the quantitative analysis, several sociodemographic factors were found to be associated with utilization of HCFs including a women's reported number of pregnancies, religion, level of education, and occupation (Cheptum et al., 2014). Age and education were also found to be significant in that older women and lower educated women were less likely to utilize health services (Cheptum et al., 2014). Furthermore, women who were employed were likely to utilize the health services as cost of services did not present a challenge (Cheptum et al., 2014). For the qualitative analysis, within the FGDs, it was found that women experienced a lack of medical supplies, inadequate staff, and poor staff attitudes when utilizing maternal services (Cheptum et al., 2014). This study shows significant sociodemographic factors associated with women's utilization of healthcare facilities and shows challenges women experienced when utilizing healthcare facilities. A limitation of this study is that the health care facility barriers analyzed from the quantitative study focused more on barriers to access than barriers to utilizing the health services.

Rutarema, Wandera, Jhamba, Akiror, & Kiconco (2015) examined the predictors of utilization of maternal services in Uganda. The purpose of this quantitative study was to examine the association between certain socioeconomic and demographic factors and the likelihood of utilizing different kinds of maternal health services (Rutarema et al., 2015). The authors categorized the utilization characteristics into three categories of undesirable, desirable, and moderate (Rutarema et al., 2015). Desired healthcare services were noted to have included a skilled birth attendant present at delivery. Moderate healthcare services included a supervised delivery and an undesirable utilization was where the mother did not deliver at a HCF. For the quantitative assessment, a survey was administered to 1,728 women of reproductive age on

maternal health services (Rutarema et al., 2015). Multinomial logistic regression was used for analysis to assess the contribution of specific predictors of ideal maternal health services utilization (Rutarema et al., 2015). Results showed women with education of a secondary level or higher were more likely to utilize desirable healthcare packages, whereas women living in rural areas who were Muslim and married were less likely to utilize health services (Rutarema et al., 2015). Rutarema et al., emphasized that many studies have been published reporting the importance of improving utilization of maternal health services and utilization varies by demographic and socioeconomic characteristics. They further note that policies need to be put into place to increase utilization of these services among vulnerable populations of women that have lower education, lower socioeconomic status, and live in more rural regions.

WASH Challenges in HCFs

Most of the studies discussed above mention challenges women experience utilizing maternal health services such as a lack of medical resources and unprofessional or unskilled healthcare workers. However, the quantitative studies rarely discuss environmental challenges of water, sanitation, and hygiene (WASH) infrastructure and how or if that may or may not affect utilization of health services. The qualitative studies seldom include WASH within FGD, or interview guides thus preventing the collection of any insight from the emic perspective about these issues.

Recently, the issue of WASH in HCFs and implications for health have become an important area of research and action (WHO & UNICEF, 2015). The cost of poor WASH infrastructure and healthcare complications has yet to be determined (WHO & UNICEF, 2015). In 2015, the WHO released the first comprehensive multi country analysis that explored the availability of WASH services in HCFs in LMICs. The HCFs in this report included hospitals,

health centers, clinics and dental surgery centers (private, public, and not for profit facilities). A total of 90 different HCFs assessments were reviewed from 54 countries between 1998-2014 (WHO & UNICEF, 2015). The WHO did not assess the facilities themselves but used multiple existing data sets to conduct a secondary data analysis on multiple data sets to create a landscape report. Only one assessment was reviewed per country, and 23 assessments were reviewed from Africa (WHO & UNICEF, 2015). Only 20 assessments were reported to be nationally representative (WHO & UNICEF, 2015).

The presentation of results mainly focused on water access and availability in HCFs as there was limited data on water quality and access to sanitation or hygiene (WHO & UNICEF, 2015). Delivery of water was reported to be lowest in the Africa region, and 42% of all HCFs were lacking an improved water point either on site or nearby (WHO & UNICEF, 2015). It was also found within this analysis that water infrastructure, such as safe disposal of waste, improved water source, and functioning latrines, was in place within these HCFs, but they were not maintained (WHO & UNICEF, 2015).

Many of the surveys reviewed by WHO had little or few WASH indicators, which lead to the absence of data on functionality, water safety, hygiene practices, and trainings for staff on infection protection control (WHO & UNICEF, 2015). Another limitation from these surveys was that indicators for water and sanitation had different meanings. The indicators did not differentiate between facilities with on-site supplies and those who have access to community sources within 500m (WHO & UNICEF, 2015. This is an example of a disconnect between the data analyzed on WASH status in HCFs and the actual WASH infrastructure within these facilities. Furthermore, most of the data collected did not consider the reliability, quantity, or safety of supplies (WHO & UNCIEF, 2015).

WHO and UNICEF are currently working to improve the quality of care in maternal health services. These organizations are providing evidence-based standards, including standards for WASH (WHO & UNICEF, 2015). They are also supporting WASH service improvements. According to the WHO, WASH services include providing available and quality water, sanitation facilities, and soap and water for handwashing (WHO & UNICEF, 2015). Furthermore, WHO has a Clean Care program whose purpose is to protect patient's safety by reducing the number of healthcare associated infections (HAIs) through implementation of infection protection control (WHO & UNICEF, 2015). The initial focus of Clean Care was to endorse proper hand hygiene practices globally (WHO (a), 2019). Currently, this program focuses on all aspects of infection prevention and control by raising awareness about the burden of HAIs, forming political and stakeholder commitment to reduce HAIs, and developing technical guides and recommendations (WHO (a), 2019).

In 2018, Cronk and Bartram (2018) provided an update to the WHO 2015 report and reported coverage estimates of environmental conditions and standard precautions items in over 120,000 HCFs in LMICs. They also explored factors associated with low coverage. The data was gathered from monitoring reports and peer-reviewed literature and included information on conditions of HCFs, service levels, and inequalities. Twenty-one indicators were collected from 129,557 HCFs from 78 LMICs. Results showed that 50% of HCFs lacked piped water, 33% lacked improved sanitation, 39% lacked handwashing soap, 39% lacked adequate infectious waste disposal, 73% lacked sterilization equipment, and 59% lacked reliable energy services (Cronk & Bartram, 2018). Inequalities in coverage that were statistically significant were between urban-rural settings, managing authorities, facility type, and sub-national administrative unit (Cronk & Bartram, 2018). These authors felt that this secondary analysis was needed as

there were no original baseline coverage estimates for HCFs for the Sustainable Development Goals.

However, in April 2019 this situation has since changed as WHO/UNICEF Joint Monitoring Programme's (JMP) released the first ever global baseline report on WASH in HCFs. The report includes data on over 560,000 HCFS in 125 countries. The key findings from this report include: two billion people lack basic water services at HCFs or rather only 55% of HCFs in least developed countries (LDCs) had basic water services, and 1.5 billion people utilize HCFs that have no sanitation services available (WHO (a), 2019). Furthermore, each year, 17 million women in LDCs deliver in HCFs that do not provide adequate WASH services (WHO (a), 2019). An additional report released by the WHO/UNICEF entitled: *WASH in HCFs: Practical steps to achieve universal access for quality care*, noted more than one million deaths each year are associated with unclean births (WHO & UNICEF, 2019). Moreover, infections account for 26% of neonatal deaths and 11% of maternal mortality (WHO & UNICEF, 2019).

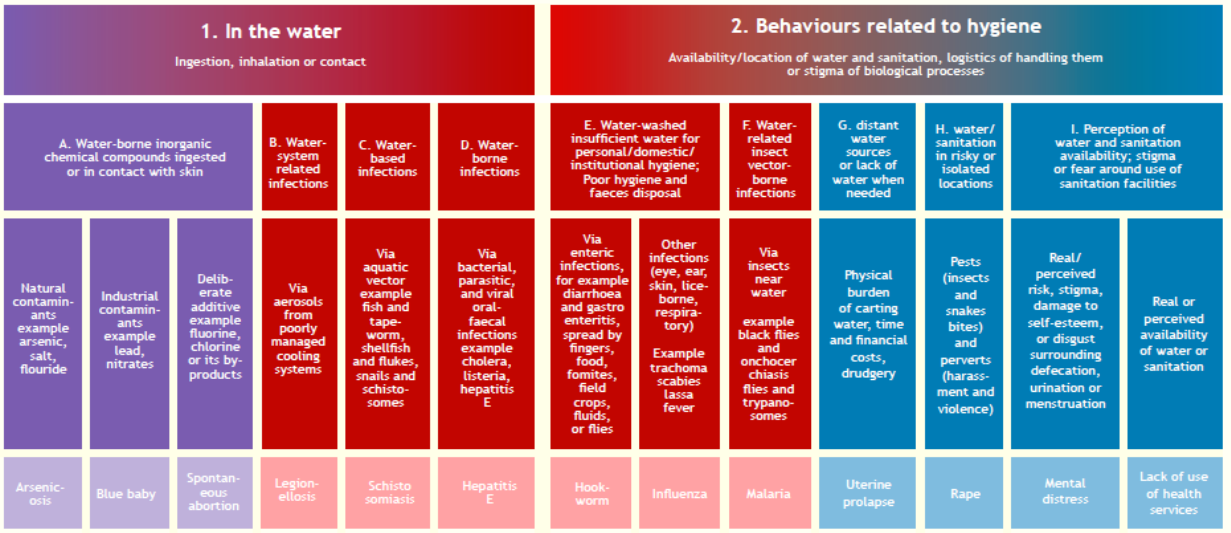
In 2014, the UN-Water Global Analysis and Assessment of Sanitation and Drinking Water (GLASS) report, coordinated by WHO, presented data on national policies on WASH in HCFs. It was found that of 88 countries that responded to this survey, only 25% had a plan for sanitation in HCFs that is currently implemented and has funding with regular monitoring (WHO (h), 2014). This survey found even less countries had a plan implemented for drinking water (24%) and hygiene (18%) (WHO (h), 2014). This study also showed that over half, 52%, of the countries surveyed did not have targets for hygiene in facilities and over a third of the countries did not have targets for sanitation (35%) or water (44%) (WHO (h), 2014). Regarding national policies and plans, targets and provision of water in HCFs in countries within sub-Saharan Africa, Uganda was found to have no response on the water target, with 66% facilities of their

facilities having water provision, and only a partial national plan being implemented (WHO, 2015). GLASS report also noted that of 72 countries with national policies in place, 46 did not have associated plans for water in HCFs for full implementation or requests for funding for total cost (WHO, 2015). Global Health initiatives are requiring WASH services in HCFs and national standards for WASH services must be enforced. Overall, the data available shows that many HCFs do not have access to water sources or sanitation, and that these water sources are neither safe nor reliable. However, there is still limited data on WASH in HCFs in regard to geographic scope and the types of services that currently exist in these regions of the world.

WASH Challenges in HCFs and how they Affect Maternal Health

Poor WASH services within HCFs has yet to be linked to increases in patients acquiring HAIs. Furthermore, there is limited data on how WASH challenges affect maternal health outcomes and the utilization of maternal health services. However, there is data that shows WASH is important in labor and delivery within communities (Mills & Cumming, 2016). In 2016, UNICEF & SHARE released an evidence-based paper assessing the causal evidence on the impact of WASH on certain health and social outcomes. The figure below illustrates how mother's health can be affected both from bacteria directly in the water and acquiring diseases from the availability, location, and reliability of the water, this is especially important to consider with water sources at HCFs while mothers are delivering (Mills & Cumming, 2016).

Figure 4: Dimensions, components and examples of health effects in conceptual framework linking WASH with maternal and reproductive health.



SOURCE: Adapted from Campbell et al., 2014

Similarly, in 2014, a study in Tanzania showed that with the existing data sources in HCFs, less than one third of births (both in home and HCFs) took place in a proper WASH environment (Benova et al., 2014). A needs assessment conducted throughout Bangladesh, India, and Zanzibar found WASH conditions to be sub-optimal in HCFs (Afsana et al., 2014; Steinmann et al., 2015, & Fakih et al., 2016). This assessment reported contaminated delivery beds, inadequate access to WASH facilities, and poor WASH facility conditions (Afsana et al., 2014; Steinmann et al., 2015, & Fakih et al., 2016). A facility-based study found an association between a measure of the water and sanitation and a high risk of hospital mortality (Galadanci et al., 2011). Overall, these papers noted that more metrics are needed on the cost effectiveness of WASH interventions in order to gain more support and funding from the nations.

Songa, Machine, & Rakuom's (2015) literature review concentrated on the topic WASH and maternal health. The authors note that there are limited data on the relationships between these two topics. They found that previous literature shows hygiene and cleanliness greatly contribute to quality of health services. More than two out of five maternal deaths occur in 24

hours of delivery from either hemorrhage or sepsis (Songa et al., 2015). Sepsis is mainly caused by unhygienic practices or poor infection prevention and control. Therefore, clean hands are essential during delivery as this will reduce the amount of exposure to infectious pathogens for the mother (Songa et al., 2015). One of the comprehensive studies Songa et al. reviewed reported that the Ministry of Health in Uganda noted that poor and inadequate sanitation and lack of water in HCFs was a major reason why patients are dissatisfied with the quality of health services (Brocklehurst & Bartram, 2010; Songa et al., 2015). Songa et al., ended their paper discussing other areas of research that could enhance the link between WASH and maternal health. These include studies on the influence of WASH on maternal mortality/morbidity at either the household or community level, rapid assessments of WASH status in HCFs, and studies on improved WASH in HCFs and maternal mortality health outcomes.

Bouzid, Cumming, & Hunter (2018) performed the first systematic review that assessed the relationship between WASH in HCFs and patient satisfaction and care seeking behavior in LMICs. Nine hundred and eighty-four papers were retrieved but only 21 papers had a WASH component with criteria that could be included within the review. Nine out of the 21 studies focused on WASH conditions within maternal health services. Patient satisfaction was mostly assessed through questionnaires. Studies did report a high risk of courtesy bias, where participants where just stating what they thought the interviewers would want to hear (Bouzid et al., 2018). This could have potentially led to an over estimation of patient satisfaction. There was also concern of an influence of answers by a patient's socioeconomic status or education. The data was summarized narratively without a meta-analysis, due to the heterogeneity of the studies and the use of different indicators for patient satisfaction (Bouzid et al., 2018). The review found that WASH is not at the forefront for patient satisfaction, but poor WASH services were

associated with significant patient dissatisfaction with infrastructure of HCF and quality of care (Bouzid et al., 2018). However, the dissatisfaction was not enough to stop people from seeking care at poor quality facilities (Bouzid et al., 2018). Conversely, a good physical environment was found to be associated with a positive assessment of the HCF (Bouzid et al., 2018). Essentially, this systematic review noted that more research is needed on this topic but that improving WASH conditions can lead to improved patient satisfaction as well as improved utilization of HCFs and improved health outcomes. Limitations of this study included that the papers reviewed were from a small publication timeframe (2000-2016), more optimal search strategy could be conducted to retrieve all ideal papers, and limited eligible research from LMICs (Bouzid et al., 2018).

Findings from this systematic review for the maternal health services were presented separately. For mothers it was noted that the main reasons for their dissatisfaction was HCWs attitudes and behaviors (Bouzid et al., 2018). For maternal health services, it was found that poor WASH provision was the reason women chose to not deliver at a HCF but rather deliver at home (Bouzid et al., 2018). In a paper analyzed for this systematic review by Steinmann & colleagues, the researchers assessed the availability and satisfaction of latrines and handwashing stations at twelve HCFs (six public and six private) in the rural Prune district in India (Steinmann et al., 2015). The study was cross sectional consisting of a questionnaire that surveyed the expectations and satisfactions among women who utilize HCFs. In terms of hospital sanitation infrastructure, the study found discrepancies between the number of latrines in public versus private facilities with 3.5 latrines in private HCFs compared to 1.3 latrines in public HCFs. They also found discrepancies between the number of handwashing stations in public verse private facilities with 0.8 stations in public compared to 3.8 stations in private (Steinmann et al., 2015).

Maternal Mortality & Standards of Quality Care in HCFs

Maternal morbidity is defined as, "any health condition attributed to and/or aggravated by pregnancy and childbirth that has a negative impact on the woman's well-being." (WHO, 2013 & UNICEF, 2016). Whereas, maternal mortality is defined as "the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes." (WHO, 2013 & UNICEF 2016). In sub-Saharan Africa, for every 26 mothers one mother dies from complications during pregnancy or childbirth (Ayele et al., 2014). This frequency is 281 times more than the frequency of maternal deaths in developed countries (Ayele et al., 2014). Globally, more than 75% of maternal deaths can be attributed to five major complications that include postpartum hemorrhage, infection such as sepsis, unsafe abortion, hypertension, or obstructed labor (WHO Maternal Mortality, 2018 & Ayele et al., 2014).

Maternal mortality is reportedly higher in rural and poorer communities, with 99% of maternal deaths in developing countries and more than half of those in sub-Saharan Africa (WHO Maternal Mortality, 2018). Between 1990 and 2015 the MMR dropped by 44% globally and from 2016-2030 Sustainable Development Goals Goal 3 has a target is to reduce the global MMR to less than 70% per 100,000 live births (WHO Maternal Mortality, 2018). It is vital for all births to be attended by a skilled health worker and to have care and treatment delivered in a timely manner. Throughout developing countries there is a low number of skilled HCWs in HCFs but skilled care before, during, and after birth can save many lives (WHO Maternal Mortality, 2018).

In 2014, the Uganda Ministry of Health released data from the Uganda Hospital and Health Centre IV Census Survey. This survey was a collaborative effort between the Ministry of Health, African Development Bank, and the WHO. The survey consisted of 147 hospitals and 188 level IV primary care facilities. A component of this census survey included reviewing facility records on quality of facility data and statistics. The second part of the survey focused on quality of HCFs including readiness or ability of hospitals/HC IVs to be able to provide services up to preferred standards of infection prevention and control, institutional mortality rates, rate of cesarean sections, and the availability of resources to ensure safe delivery of healthcare services. Maternal mortality rate in hospital/health center IVs was 133 throughout July 2011-June 2012 and 276 from July 2012 through June 2013 (Uganda Hospital and Health Centre IV Census Survey, 2014). Both of these hospital/health center IVs MMRs were lower than the national average, showing that many maternal deaths were happening outside the HCFs. Results showed that the HCFs capability of infection prevention and control was good, and using their specified criteria (participation in the accreditation process, conducting routine quality assurance, forming a quality assurance committee, having quality monitoring indicators in place, having a system to receive client feedback on HCF services, conducting case reviews and death reviews) found very few facilities had poor capacity (Uganda Hospital and Health Centre IV Census Survey, 2014).

Further, the availability of systems and practices for guaranteeing delivery of quality care was assessed on eight items that included participating in accreditation process, performing routine quality assurance, having a quality assurance committee, having monitoring indicators for quality in place, having systems in place for patients to provide feedback to HCFs, conducting case reviews and death reviews (Uganda Hospital and Health Centre IV Census

Survey, 2014). Only five HCFs (19%) had all of these items in place to ensure delivery of quality care. Performing routine quality assurance was most commonly reported at 91% but having a quality assurance committee in place was the least commonly reported (38%). (Uganda Hospital and Health Centre IV Census Survey, 2014.)

MSD (Merck in the United States and Canada) for Ugandan Mothers program involves training of private HCFs on quality care with a comprehensive and personalized training on quality assurance (MSD for Ugandan Mothers Program). Within this NGO's program, 42 districts have been reached and 837 midwives have been trained (MSD for Ugandan Mothers Program). This program has monitoring in place to assure the quality of healthcare being provided in these facilities continues after post training of midwives. MSD is also working with communities to raise awareness for village savings & loan associations, a form of insurance so that more mothers are able to afford private care. MSD has noted challenges of the infrastructure of facilities, specifically in rural areas where buildings were not built with the sturdiest material (MSD for Ugandan Mothers Program). MSD for Ugandan Mothers has a program in place that is working to expand and provide access to affordable quality private maternal healthcare services. This program aims to examine the possibility of using the private health sector in Uganda to increase access, utilization, and lower the country's MMR (MSD for Ugandan Mothers Program). In an analysis conducted by The London School of Hygiene and Tropical Medicine, researchers found that 60% of Ugandan women have accessed maternal health services from private health providers (MSD for Ugandan Mothers Program). Forty-five percent of all HCFs in Uganda are private but only 14% of deliveries are within those private facilities (MSD for Ugandan Mothers Program). MSD found many women prefer private HCFs due to the close distance from home, the flexible hours, as well as the quality of care, which they stated to be

personalized and sensitive to local customs and culture. However, issues of concern with private HCFs can be that they are unregulated, costly, and of varied quality that is not efficient (MSD for Ugandan Mothers Program). Lastly, MSD for Ugandan Mothers encourages collaboration between private HCFs and the Ministry of Health to allow for streamlined care.

There is an increase in utilization of maternal health services and births in facilities but there is a lack of improvement in the quality of care, specifically WASH standards. Globally, around 1 million deaths may be related to unclean births, but more evidence is needed on this health impact (WASH in HCFs, 2016). The WHO recognizes that more births are occurring in HCFs but the decline for MMR continues to be slow (WHO, 2016). The focus has shifted to quality of care, given that poor quality of care leads to higher morbidity and mortality. Therefore, in 2016 the WHO released the Standards for Improving Quality of Maternal and Newborn Care in HCFs. The WHO standards include eight frameworks with six strategic areas. The standards provide definitions of quality of care around the time of delivery, with each standard having 2-13 quality statements (WHO, 2016). Each of the eight standards are relatively broad with multiple quality statements that are then followed by a number of inputs, outputs, and process/outcome measures. Standards 7 and 8 are the main focus for this literature review as well as this secondary data analysis (WHO, 2016).

Standard 7 states, "for every woman and newborn, competent, motivated staff are consistently available to provide routine care and manage complications." (WHO, 2016). Standard 8 states, "the health facility has an appropriate physical environment, with ***adequate water, sanitation,*** and energy supplies, medicines, and supplies and equipment for routine maternal and newborn care and management of complications" (WHO, 2016). Standard 7 quality statements center around ensuring each mother has at least one skilled birth attendant present at

delivery and the skilled staff are competent and have enough skills to safely perform a delivery (WHO, 2016). Standard 8 quality statements focus on functional, reliable, safe, and sufficient WASH infrastructure and stock of medical supplies for both the staff and patients at the HCF (WHO, 2016). Standard 8 places an emphasis on having essential physical resources (WASH standards) available at these HCFs in order to promote and improve quality of care.

Lastly, the WHO implementation approach for these standards includes establishing leadership to structure and allow for function of these standards, adapting these standards of care to a national context, conducting situation analysis/assessments of inputs, outputs, and outcomes the quality standards in HCFs, ensuring essential infrastructure to begin building the capability and implementing the interventions, continuing to measure the quality of care and health outcomes, and finally refining the strategies that can be scaled up (WHO, 2016).

Challenges to utilizing maternal healthcare services are relatively known in developing countries, as seen throughout the literature. However, what is missing, is an understanding of how mothers perceive these challenges and the extent to which these challenges affect their utilization of maternal health services. One specific challenge that has very limited data is WASH services in HCFs and how that affects mother's utilization of health services or if it even affects mother's utilization of health services at all. This secondary data analysis plans to analyze quantitative data to assess non-WASH verse WASH challenges western Ugandan mothers experience when utilizing HCFs and if there are any associations based on regional district or type of HCF. Qualitative analysis will also explore mother's perspectives on challenges experienced while utilizing HCFs. This data can help illuminate the quality of care in HCFs with an emphasis on how essential physical resources may affect utilization of health services among mothers in a developing country.

Chapter III- Methodology

Introduction

Throughout 2015-2016 Emory University partnered with Uganda Ministry of Health, Care International, Assist International, and Makerere University School of Public Health to place water purification systems in six hospitals in western Uganda. These organizations also implemented a health education intervention on WASH procedures.

The research used for this secondary data analysis was conducted in areas surrounding Kisiizi hospital in Rukungiri district and Bwindi hospital in Kanungu district. These are two out of the six hospitals that received the water purification systems. In March 2018, a team of researchers from the Makerere School of Public Health used qualitative methods to explore the status of WASH in the health facilities in the Kanungu and Rukungiri districts of Uganda and the factors that influenced mothers' decisions for choice of delivery place. The research team also conducted a quantitative survey that assessed health seeking behaviors among women within these districts.

Original Makerere Study: Geography & Study Sites

The Rukungiri and Kanungu districts are both located in the southwestern region of Uganda (City Population, 2017). Both districts are close to the border of the Democratic Republic of the Congo (City Population, 2017).

(Teach Uganda, 2018)

The district Rukungiri has an estimated population of 322,5000 as of 2017 (City Population, 2017). The district of Kanungu has an estimated population of 263,100 as of 2017 (City Population, 2017). Rukungiri has 271,118 people living in rural areas compared to 43,576 in urban cities (City Population, 2017). Kanungu district is similar with 201,136 people living in rural areas compared to the 51,008-people living in urban areas (City Population, 2017). Kanungu has two hospitals; one government (Kambuga hospital in Kambuga Town Council) and one private hospital (Bwindi Community Hospital located on the outskirts of Bwindi forest). Additionally, this district has two Level 4 Health Center's and ten Level 3 government health centers. Rukungiri has 2 major hospitals; Kabale hospital (public) and Kisiizi hospital (private). Additionally, this district has three Level 4 Health Center's and ten Level 3 government health centers (National District Health Staff Records).

Research Design

The health seeking behavior study was a cross sectional mixed methods design. The data was collected throughout March of 2018. Qualitative data was collected over 1.5 weeks and then the quantitative was collected over 2.5 weeks.

Original Makerere Qualitative Study

In March of 2018, a qualitative exploration of mothers' health seeking behaviors was conducted. A total of ten in depth interviews were conducted with mothers who resided in Kanungu and Rukungiri districts and recently delivered a child. Five mothers were interviewed from each district. A total of fourteen focus group discussions were conducted with mothers who who resided in Kanungu and Rukungiri districts and recently delivered a child. Mothers were recruited by village health team members within the community. Key informant interviews included health care workers, district water officers, assistant district health officers in charge of maternal and child health, a village health team member, and a traditional birth attendant in the districts of Rukungiri and Kanungu in western Uganda. The IDI, FGD, and KII interviews were conducted in the language Lunyankole, which is the main language in western Uganda.

Qualitative Study Population & Sample

The population for the qualitative portion of the study included members living in the Rukungiri and Kanungu districts of western Uganda. The in-depth interviews (IDIs) consisted of mothers who had delivered in either district within the past month. Focus group discussions (FDGs) consisted of mothers who had delivered in either district within the past year. Mothers were recruited through the Village Health Team (VHT) members. The VHT were utilized for purposive sampling as they were able to easily identify and recruit mothers who had delivered a

child within the last month or year prior to the beginning of the study. Mothers who were recruited included those who delivered at a HCF and those who did not.

Four key informant interviews were conducted in the Kanungu district. These included discussions with the district health officer, Bwindi hospital administrator, village health team member, and district water officer. The four key informant interviews in the Rukungiri district included the assistant district health officer in charge of maternal and child health, the district water officer, the in-charge nurse at Kisiszi hospital, and a traditional birth attendant. The key informants were recruited through the Principle Investigator of the study.

Mothers were chosen as the population for this study as they are the patients who have experienced delivering a child at the different HCFs in their districts. They can offer the best insight into what barriers, challenges, and protocols actually happen at these facilities. Experts in the WASH field and the healthcare administration or services were also the targeted population as they can speak to how the healthcare facilities and WASH services are supposed to run and what protocols are in place from an administrative level.

Qualitative Study Procedures

Focus group discussions and in-depth interviews were conducted with mothers who lived within the selected villages from the randomly selected quantitative sampling method. Focus group discussions were categorized into age and location (urban verse rural). FGDs were conducted with 10-12 mothers in each group. The theoretical principle of saturation by Glaser and Strauss was used in the original study to determine the number of in-depth interviews, focus group discussions, and key informant interviews that needed to be completed. A total of ten IDIs were conducted, five in each district. Nine FGDs were conducted, four in the Kanungu district

and five in the Rukungiri district. Eight key informant interviews were conducted, four in each district.

Qualitative Study Data Collection Instruments

In depth interview guide with mothers who have delivered in the past month, had a total of eleven questions, varying from experience of delivery at HCF, challenges experienced when delivered, cost of delivery services, satisfaction of delivery services, and how WASH services at HCF influence the choice of where mothers deliver. Closing question asked for mother's suggestions for improving delivery services at HCFs in the districts. This secondary data analysis analyzed the sections of the interview that focus on the challenges mothers experienced while delivering at HCF and how the WASH services at HCFs influenced where they choose to deliver.

Focus group discussion guide had a total of eight questions pertaining to mothers in the community and their perspective on the challenges, cost, satisfaction, important elements, and suggestions for improving delivery services at nearest HCFs. FGDs will not analyzed in the secondary data analysis due to limitations that will be discussed below.

Lastly, there were two different key informant interview guides. One guide was designed specifically for healthcare workers and the other one was designed for non-healthcare workers. Both guides had ten questions each. Healthcare workers guide covered topics on the type of services offered at the HCF interviewee worked at, health seeking behavior among women in the community, WASH status at HCFs, and recommendations for improving delivery services. The non-healthcare workers guide focused on maternal child health services in the community and WASH status at HCFs. Key informant interviews were not used in the secondary data analysis as the focus is solely on mothers' perspectives on the challenges they experience with delivery

services at HCFs. See Appendix 2, 3, and 4 for complete in-depth interview, focus group discussion, and key informant guides.

Original Makerere Quantitative Study

The latter of March 2018 consisted of conducting a household survey to quantitatively measure health seeking behaviors among mothers in the Rukungiri and Kanungu districts. The original survey included questions on demographics, health seeking behavior of maternal child health services, WASH status at HCF, and challenges accessing delivery services. The survey was administered door to door, with mothers who had recently delivered in either the Kanungu or Rukungiri districts, close to the Kisizzi and Bwindi hospitals. Overall, 894 mothers received the survey.

Quantitative Study Population & Sample

Sampling for the quantitative household survey involved mathematical calculations to ensure random sampling. Sixty total clusters (villages) were made, a size of 15 were selected proportionally from the two districts to end up with a minimum of 900 households. A design effect of 2 and non-response rate of 10% was taken into consideration. Households were near the Kisiizi and Bwindi hospitals. For each hospital area, 30 villages were randomly selected and 15 households within each village were chosen to conduct the surveys. In each district, a total of 450 households were selected. A compass was used to identify the starting direction and determine the interval of household selection. Population of the villages were provided by the village local council chairpersons. A sampling interval K was calculated by dividing the total number of households per village by the number of household targeted for inclusion in the study. This was done in order to get 15 respondents per cluster (village). Guidance from the local chairperson allowed the research team to locate the center of the village and then use the

compass to identify the northern direction as the starting direction for the questionnaire. The northern direction was followed until the village boundary was reached and then the same pattern was repeated in different clockwise directions. A mother having her youngest child of, 0-12 months, was considered for the study as this means she had delivered within the past year. Exclusion criteria included a household without a child that is 0-12 months and sick mothers. Lastly, households where mothers were absent at the time of the survey collection were excluded as well (Dr. Mugambe, Principal Investigator of Makerere study, unpublished protocol).

Quantitative Study Procedures

The structured questionnaire was conducted within households in selected villages within Kanungu and Rukungiri districts. The questionnaire was conducted in the language Lunyankole, which is the main language in western Uganda.

Quantitative Study Data Collection Instruments

A structured questionnaire was the instrument used to collect quantitative data on women's health seeking behaviors in the districts of Kanungu and Rukungiri. The structured questionnaire was separated into five sections. Part one (seven questions) included general information, whereas part two included sociodemographic characteristics of the mothers and their asset ownership (10 questions). General information had seven indicators stating date of interview, questionnaire number, parish, village, district, start time of questionnaire, and name of interviewer. Sociodemographic characteristics indicators were age, religion, education, number of births, number of children alive, marital status, occupation, years lived in village, type of electricity in house, and wealth index. Asset ownership gathered information on items that the mothers had within their household (11 questions). Within the questionnaire, in part two there was a dwelling unit construction and characteristics section which research assistants observed

and recorded their findings (9 questions). Part three (28 questions) focused on indicators of mothers seeking of MCH services. This included the type of health facility mothers sought MCH services, type of services sought, reason for choosing to deliver at type of facility, and reasons for possibly delivering at said facility for next birth. This section also included questions on the general WASH status in the HCF and the level, distance, and cost of transportation to nearest HCF. Part four (19 questions) specifically addressed details on the WASH status at the HCFs and the mother's satisfaction with the WASH services. Part five (21 questions), the final section of the questionnaire, addressed challenges utilizing delivery services for mothers who had delivered at a HCF. The particular variable this secondary data analysis will focus on are the sociodemographic characteristics, type of HCF mother delivered at, WASH status at HCFs, and the kinds of challenges mothers experienced while delivering at the HCF. See Appendix I for complete structured questionnaire instrument.

Plans for Secondary Data Analysis of Quantitative Data

Analysis of quantitative data evaluated the non-WASH challenges versus water, sanitation, and hygiene (WASH) challenges western Ugandan women experience. The variables selected from the quantitative data include sociodemographic factors such as district, age, level of education, marital status, occupation, and average monthly household income. Other variables included whether mothers utilized maternal child health services when delivered and what type of health care facility they delivered at (public versus private not for profit versus private). WASH indicators included in analysis were latrines separated by sex, handwashing facilities outside latrines, presence of water and soap for handwashing stations outside latrines, whether mothers carried water from their home to the HCF on the day of delivery, clean walls and floors in HCFs, latrines with pit covers, and main water source. Lastly, the variables for challenges

western Uganda mothers experienced when delivered in a HCF included poor WASH services, unskilled birth attendants, long wait time, poor health worker attitude, expensive services, and other challenge.

Secondary Analysis Questions from Original Makerere Survey

Question	Response
District	1. Kanungu 2. Rukungiri
How old are you? (Record age in completed years)	Years
What is your highest level of education you attained?	1= None 2= Primary (P1 to P7) 3= Secondary 4= Tertiary
What is your marital status?	1= Single 2= Married/cohabiting 3= Widowed 4= Divorced/separated
What is your occupation?	1=Peasant 2=Casual laborer 3=Business person 4=Salaried worker 5=Unemployed 6=Other (specify) _____
What is the average monthly income of the HH head? (Uganda Shillings)	_____Uganda shillings
Did you ever seek MCH services during your most recent pregnancy from a health facility in this area? If No, go to 3.4.	1=Yes 2=No
If Yes, which type of health facility did you seek MCH services from?	1=Public facility [name] _____ 2=PNFP facility [name] _____ 3=Private facility [name] _____

<table>
<tr><td>What was the water, sanitation and hygiene status in the health facility where you delivered your youngest child?</td><td><table>
<tr><td>Separate latrines for men and women</td><td>1=Yes</td><td>2=No</td></tr>
<tr><td>Hand washing facilities outside the latrine</td><td>1=Yes</td><td>2=No</td></tr>
<tr><td>Presence of water and soap for hand washing outside latrine</td><td>1=Yes</td><td>2=No</td></tr>
<tr><td>Carried water from home to the health facility on the day of delivery</td><td>1=Yes</td><td>2=No</td></tr>
<tr><td>Clean walls and floors in health facility</td><td>1=Yes</td><td>2=No</td></tr>
<tr><td>Latrines with pit covers</td><td>1=Yes</td><td>2=No</td></tr>
</table></td></tr>
<tr><td>What is the main source of water at the nearest public health facility that offers delivery services?</td><td>1=Public taps/ stand pipes
2=Boreholes
3=Protected dug well
4=Unprotected dug well
5=Protected spring
6=Unprotected spring
7=Surface water (dams, lakes, rivers, stream, ponds and canal)
8=Rain water tank
9=Cart with tank / water vendor
10=Piped health facility water connection located inside the house, plot or yard
11=Don’t know
12=Other (specify)</td></tr>
<tr><td>What challenges did you experience when you delivered your last baby?</td><td>1=Poor WASH services
2=Unskilled birth attendants
3=Long waiting in long lines
4=Poor health-worker attitude
5=Expensive services
6=Others (specify) _____</td></tr>
</table>

Data were analyzed using SAS software. Quantitative analysis included frequency tables on sociodemographic factors and utilization of the types HCFs where mothers delivered. Chi square tests were done to determine if there is a difference of WASH status between the HCFs

based on districts. Chi square tests were also done to determine if there were any associations between non-WASH and WASH challenges or WASH status at HCFs based on regional district or type of health care facility.

Plans for Secondary Data Analysis of Qualitative Data

The qualitative analysis of an in-depth interviews to explore mothers' perspectives on the challenges will included an examination of some questions from the in-depth interview guide with mothers. Data were analyzed using MAXQDA software.

Secondary Analysis Questions from Original Makerere In-depth Interview Guide

What challenges did you face when you delivered this baby? Probe for distance to health facility, skilled health workers, poor attitude of health workers, availability of medicines and supplies, cost of services at the facility, household income. Why do you think some mothers do not deliver at health facilities?
Do you pay for delivery services at the nearest health facility? If yes, how much, and for what?
What are the important elements for you in a health facility that offers delivery services?
How does WASH services at health facilities influence your choice of health facility to deliver from?
What are your suggestions in improving delivery services at the nearest health facility?

Thematic analysis was done to analyze the qualitative data. The qualitative analysis built off from the quantitative analysis.

Ethical Considerations (IRB)

The database is devoid of personally identifying information. The data were collected in Uganda by the Makerere University School of Public Health and was placed in a database by the Makerere research team. The Makerere study is part of the WASH in HCF study under Emory

IRB 78907. IRB approval for the Makerere study was also sought and granted in Uganda. This secondary data analysis was exempt from Emory IRB (IRB00109339).

Chapter IV- Results

Introduction: For this secondary analysis, a total of 894 women were included in the quantitative study to investigate the non-WASH versus WASH challenges mothers experience when utilizing maternal health services for delivery. A total of ten in-depth interviews were analyzed for the qualitative portion of the study to explore mother's perspectives on the challenges they experience when utilizing maternal health services at a healthcare facility.

Quantitative Findings

Among the 894 women surveyed, the mean age was 26.6 (age range 16-45). Women's highest level of education was seen to be highest among primary level (P1 to P7) (55%). Women's marital status was highest for married or cohabiting (785/87.8%). And women's occupation was seen highest as peasant (666/74.5%). The average monthly household income was $35.2 overall.

There were more women in the Kanungu district (453) compared to the Rukungiri district (441). Women in the Rukungiri district were slightly older than the women in the Kanungu district (mean of 27.3 compared to 26.0). There are slightly more single women in the Kanungu district compared to the Rukungiri district (8% compared to 7%). Please see Table 1 for the remainder of the demographic details of this sample.

Table 1: Demographic Characteristics of Study Sample

Variable	Overall Survey Participants	Kanungu District	Rukungiri District
N **Age in years: Mean (Range)**	894 26.6 (16-45)	453 26.0 (16-45)	441 27.3 (16-45)
Average Monthly Household Income (Uganda Shillings) (USD)	785 130839.5 35.2	407 140570.0 37.82	378 120362.4 32.38

	N (%)	**N (%)**	**N (%)**
Highest Level of Education			
None	69 (7.7)	9 (8.6)	30 (6.8)
Primary (P1 to P7)	492 (55.0)	259 (57.2)	233 (52.8)
Secondary	252 (8.2)	112 (24.7)	140 (31.8)
Tertiary	81 (9.1)	43 (9.5)	38 (8.6)
Marital Status			
Single	67 (7.5)	36 (8.0)	31 (7.0)
Married/cohabiting	785 (87.8)	393 (86.8)	392 (88.9)
Widowed	7 (0.8)	3 (0.7)	4 (0.9)
Divorced/separated	35 (3.9)	21 (4.6)	14 (3.2)
Occupation			
Peasant Farmer	666 (74.5)	335 (74.0)	331 (75.1)
Casual laborer	14 (1.6)	10 (2.2)	4 (0.9)
Business Person	128 (14.3)	60 (13.3)	68 (15.4)
Salaried worker	50 (5.6)	18 (4.0)	32 (7.3)
Unemployed	35 (3.9)	29 (6.4)	6 (1.4)

Overall, 806 (90.2%) women received maternal health services from a HCF, 423 (93.4%) women from the Kanungu district and 383 (86.68%) women from the Rukuungiri district. For the type of healthcare facility utilized overall, 198 (24.6%) mothers utilized a public facility, 538 (66.8%) utilized a private not for profit facility, and 68 women (8.5%) utilized a private HCF. More women in the Kanungu district utilized a private not for profit facility compared to women in the Rukungiri district (70% versus 63.2%). Please refer to Table 2 for utilization results overall and by region.

Table 2: Western Ugandan Mothers' Utilization of HCFs for Labor & Delivery

Variable	Overall Survey Participants	Kanungu District	Rukungiri District
	N (%)	**N (%)**	**N (%)**

Utilize MCH Services from HCF			
Yes	806 (90.2)	423 (93.4)	383 (86.8)
No	88 (9.8)	30 (6.6)	58 (13.2)
Type of Facility Utilized: Public			
Yes	198 (24.6)	92 (21.8)	106 (27.7)
No	608 (75.4)	331 (78.3)	277 (72.3)
Type of Facility Utilized: PNFP (Private not for profit)			
Yes	538 (66.8)	296 (70.0)	242 (63.2)
No	268 (33.3)	127 (30.0)	141 (36.8)
Type of Facility Utilized: Private			
Yes	68 (8.5)	35 (8.3)	33 (8.6)
No	737 (91.6)	388 (91.7)	349 (91.4)

WASH Status at HCFs Reported by Mothers

Based on self-report, 96% of women living in Kanungu had handwashing facilities located outside of the latrines at the HCF they utilized compared to the 99% of women living in the Rukungiri districts (p=0.0023). Eighty-seven percent of women living in Kanungu had water and soap present at the handwashing stations associated with the latrines at the HCF utilized compared to the 92% of women living in the Rukungiri district (p=0.0310). Forty-seven percent of women living in Kanungu had latrines with pit covers at the HCF they utilized compared to the 37% of women living in the Rukungiri district (p=0.0003). The top three water sources in the Kanungu district were public taps/stand pipes (36.9%), protected spring (25.2%), and surface water (13.7%). The top three water sources in the Rukungiri district were public taps/stand pipes (37.4%), protected spring (32.4%), and surface water (13.7%). There was a significant difference in main sources of water between the two districts (p<0.001). Further analyses were not

performed to break down the main water source categories to understand the reason for statistical significance. See Table 3.

Table 3: WASH Status HCF Delivered Based on Districts

	Kanungu (N=427)	Rukungiri (N=379)	Chi Square
	N (%)	**N (%)**	
Latrines Separated by Sex	409 (95.8)	371 (97.9)	2.84; p value=0.0914
Handwashing facilities outside latrine	409 (95.8)	376 (99.2)	***9.28; p value=0.0023
Presence of water & soap for hand washing stations outside latrine	372 (87.1)	348 (91.8)	***4.66; p value=0.0310
Carried water from home to the HCF on the day of delivery	11 (2.6)	15 (4.0)	1.23; p value=0.2678
Clean walls and floors in HCF	418 (97.9)	374 (98.7)	0.73; p value=0.3925
Latrines with pit covers	201 (47.1)	140 (36.9)	***15.96; p value=0.0003
Main Water Source: Public taps/stand pipes Boreholes Protected dug well Unprotected dug well Protected Spring Unprotected Spring Surface water (dams, lakes, rivers, stream, ponds, canals) Rain water tank Cart with tank/water vendor Piped health facility water connection located inside the house, plot or yard Do not know	**Total N=453** 167 (36.9) 5 (1.1) 5 (1.1) 10 (2.2) 114 (25.2) 35 (7.7) 62 (13.7) 3 (0.7) 3 (0.7) 0 (0.0) 49 (10.8)	**Total N=441** 165 (37.4) 28 (6.4) 23 (5.2) 4 (0.9) 143 (32.4) 19 (4.3) 34 (7.7) 4 (0.9) 0 (0.0) 2 (0.5) 19 (4.3)	***64.59; p value= <.0001

*****=significant values**

Most Common Challenges Mothers Experienced Utilizing HCFs

Expensive services (6.1%) was the most common challenge overall among western Ugandan mothers utilizing maternal health services in either district. The next most common

challenges experienced when utilizing HCFs were poor attitude of healthcare workers (2.7%) followed by long wait times (2.7%), unskilled birth attendants (0.3%), and lastly poor WASH services (1.1%).

Two percent of women living in Kanungu district experienced poor WASH challenges in a healthcare facility compared to 0.3% of women living in the Rukungiri district, a significant difference (p=0.0300). See Table 4.

Table 4: Challenges Western Uganda Mothers Experienced When Delivered in Health Care Facility

	Overall Survey Participants	Kanungu N=427	Rukungiri N=379	Chi Square
	N (%)	**N (%)**	**N (%)**	
Poor WASH services Yes No	 9 (1.1) 797 (98.9)	 8 (1.9) 419 (98.1)	 1 (0.3) 378 (99.7)	***4.71; p value=0.0300
Unskilled birth attendants Yes No	 2 (0.3) 804 (99.8)	 0 (0.00) 427 (100)	 2 (0.5) 377 (99.5)	2.26; p value=0.1328
Long wait time Yes No	 20 (2.5) 786 (97.5)	 9 (2.1) 418 (97.9)	 11 (2.9) 368 (97.1)	0.52; p value=0.4692
Poor health-worker attitude Yes No	 22 (2.7) 784 (97.3)	 11 (2.6) 416 (97.4)	 11 (2.9) 368 (97.1)	0.08; p value=0.7766
Expensive services Yes No	 49 (6.1) 757 (93.9)	 20 (4.7) 407 (95.3)	 29 (7.7) 350 (92.4)	3.10; p value= 0.0784

*****=significant values**

Challenges Mothers Experienced Utilizing Public HCFs

Eighty-seven women from the Kanungu district and 81 women from the Rukungiri district utilized public HCFs. Six percent of women living in Kanungu district experienced poor WASH challenges in a public HCF compared to 0.0% of women living in the Rukungiri district

(p=0.0285). Zero percent of women living in Kanungu district experienced expensive services as a challenge in a public HCF compared to 6.2% of women living in the Rukungiri district (p=0.0186). See Table 5.

Table 5: Challenges Western Uganda Mothers Experienced When Delivered in Public Health Care Facility

	Kanungu N=87	Rukungiri N=81	Chi Square
	N (%)	**N (%)**	
Poor WASH services Yes No	 5 (5.8) 82 (94.3)	 0 (0.0) 81 (100.0)	****4.80; p value=0.0285**
Unskilled birth attendants Yes No	 0 (0.0) 87 (100.0)	 0 (0.0) 81 (100.0)	Row or column sum 0; no statistics completed
Long wait time Yes No	 0 (0.0) 87 (100.0)	 2 (2.5) 79 (97.5)	2.17; p value=0.1404
Poor health-worker attitude Yes No	 1 (1.2) 86 (98.9)	 2 (2.5) 79 (97.5)	0.42 p value=0.5187
Expensive services Yes No	 0 (0.0) 87 (100)	 5 (6.2) 76 (93.8)	****5.54; p value=0.0186**

*****=significant values**

Challenges Mothers Experienced Utilizing Private not for Profit (PNFP) HCFs

Two hundred and eighty-five women from the Kanungu district and 220 women from the Rukungiri district utilized PNFP HCFs. Seven tenths percent of women living in Kanungu district experienced poor WASH challenges in a PNFP HCF compared to 0.5% of women living in the Rukungiri district (p=0.7200). Compared to the women who delivered at public facilities in both districts, non-WASH and poor WASH challenges were significant for women who delivered at a PNFP HCF. See Table 6.

Table 6: Challenges Western Uganda Mothers Experienced When Delivered in Private Not for Profit Health Care Facility

	Kanungu N=285	Rukungiri N=220	Chi Square
	N (%)	**N (%)**	
Poor WASH services Yes No	 2 (0.7) 283 (99.3)	 1 (0.5) 219 (99.6)	0.13; p value=0.7200
Unskilled birth attendants Yes No	 0 (0.0) 285 (100.0)	 1 (0.5) 219 (99.6)	1.30; p value=0.2546
Long wait time Yes No	 9 (3.2) 276 (96.8)	 6 (2.7) 214 (97.3)	0.08; p value=0.7775
Poor health-worker attitude Yes No	 8 (2.8) 277 (97.2)	 7 (3.2) 213 (96.8)	0.06; p value=0.8057
Expensive services Yes No	 17 (6.0) 268 (94.0)	 21 (9.6) 199 (90.5)	2.29; p value=0.1304

Challenges Mothers Experienced Utilizing Private) HCFs

Thirty women from the Kanungu district and 27 women from the Rukungiri district utilized private HCFs. Zero percent of women living in Kanungu district experienced poor WASH challenges in a private HCF compared to 0.0% of women living in the Rukungiri district (p value could not be calculated due to zeros in column). Compared to the women who delivered at public facilities in both districts, non-WASH and poor WASH challenges were significant for women who delivered at a private HCF. See Table 7.

Table 7: Challenges Western Uganda Mothers Experienced When Delivered in Private Health Care Facility

	Kanungu N=30	Rukungiri N=27	Chi Square
	N (%)	**N (%)**	

Poor WASH services Yes No	 0 (0.00) 30 (100.0)	 0 (0.00) 27 (100.0)	Row or column sum 0; no statistics completed
Unskilled birth attendants Yes No	 0 (0.00) 30 (100.0)	 1 (3.7) 6 (96.3)	1.13; p value=0.2876
Long wait time Yes No	 0 (0.00) 30 (100.0)	 3 (11.1) 24 (88.9)	3.52; p value=0.0607
Poor health-worker attitude Yes No	 1 (3.3) 29 (96.7)	 1 (3.7) 26 (96.3)	0.006; p value=0.9395
Expensive services Yes No	 2 (6.7) 28 (93.3)	 3 (11.1) 24 (88.9)	0.35; p value=0.5537

Qualitative Findings

Challenges Experienced When Utilizing Maternal Healthcare Services

Ten in-depth interviews were analyzed to explore mothers' perspectives on the challenges. The questions from the in-depth interview guide included:

1. What challenges did you face when you delivered this baby? Probe for distance to health facility, skilled health workers, poor attitude of health workers, availability of medicines and supplies, cost of services at the facility, household income. Why do you think some mothers do not deliver at health facilities?
2. Do you pay for delivery services at the nearest health facility? If yes, how much, and for what?
3. What are the important elements for you in a health facility that offers delivery services?

4. How does WASH services at health facilities influence your choice of health facility to deliver from?
5. What are your suggestions in improving delivery services at the nearest health facility?

Four Key themes were found from this analysis:

1. Awareness of WASH Challenges: Mothers did not find WASH to necessarily be a challenge that occurred while they delivered. They discussed the WASH status at the HCF they delivered at when prompted by the specific question that asked about how WASH services influence their choice of where to deliver.

> "The water was there. After delivering, they give you warm water. The sanitation is good because they wake up early in the morning and mop. After that, they keep checking and when the place is dirty, they clean again." (Respondent from Kanungu-Bwindi)

WASH Status at HCFs

Mothers found the HCFs to have sources of clean water and latrines that were accessible and clean. They also noted that the healthcare workers (HCWs) at the facilities would provide boiled water. Furthermore, they noted the HCFs were cleaned relatively often. However, mothers stated they did have to bring their own soap to the HCF. Moreover, mothers mentioned that many latrines were shared by pregnant and non-pregnant women as well as men in some HCFs and they believe pregnant women should have separate latrines.

> "There are toilets which are used by everyone, whether a patient or not…..They are used by pregnant women, they are used by non-pregnant women…" (Respondent from Kanungu-Kihembe)

WASH & Infections in HCFs

Mothers noted they worried about contracting infections from other patients. When prompted about HCWs hygiene, they noted HCWs used gloves prior to touching a mother during examination or delivery and washed their hands after coming into contact with a patient.

> "I know that when I reach the health facility…so that means when I go to the washroom or toilet and I find that it is dirty….it becomes possibly easy for my baby to have infections." (Respondent from Kanungu-Kihembe)

WASH & Influence on Choice of Where to Deliver

When questioned on whether WASH status at a HCF influenced their choice of delivery, mothers said yes because water is important during delivery and post-delivery. They mentioned scarce water is a concern if that occurs at a HCF because that can lead to unsanitary conditions for both the mother and neonate. Mothers noted that they feel uncomfortable at unhygienic health facilities.

> "Women talk about it and most times they say that [HCF] is a dirty place. Dirty. And they feel uncomfortable going there because it is a dirty health facility, they are un comfortable because there is no water sometimes." (Respondent from Kanungu-Kihembe)

WASH & Rural Villages

Another issue that was discussed regarding WASH was the mothers noted that women from the rural villages were not familiar with how to flush the toilets and that would lead to the latrines becoming relatively unclean.

> "Flushing is for town people, but a village person may not know that they need to flush." (Respondent from Rukungiri-Kisizi)

2. Financial Challenges: Services had to be paid when mothers delivered at certain HCFs. They stated how they not only had to pay for services but also for additional tests, such as a scan. Furthermore, mothers stated when they had an emergency operation, it was a very expensive service. Mothers mentioned that there were fines at certain HCFs.

> "Yes, there are charges, fines like when you wash utensils from the hand washing place, then you pay a fine." (Respondent from Kanungu-Bwindi)

There were mothers that stated they had to sell their family land in order to pay off their medical expenses. Mothers noted women with money are able to deliver at Bwindi, a private facility, but most have to use the public HCFs.

Insurance

Furthermore, mothers discussed being a part of an insurance plan when they were referencing costs. Mothers stated that some costs at the HCFs were not expensive, given they had insurance. Mothers referred to insurance as vouchers or equality.

> "Yes, some costs, because for me I paid 35,000shs. 35,000shs, on 'equality' that is what you pay. And when you get an operated on, you pay 70,000shs when you are on equality." (Respondent from Kanungu-Bwindi)

3. Quality of Care Challenges: Mothers stated that doctors were scarce at times and they would have delayed deliveries due to lack of medical staff present at HCFs. Mothers noted they would not receive care as soon as they arrived and would not feel "welcomed" at the facilities.

"Sometime you find that they [HCWs] delay….and they leave you alone and go to attend to others….So you have to first call them, which is not nice, and they ignore you." (Respondent from Rukungiri-Kisizi)

Complications at Delivery

Mothers also noted that when they received delayed care there was concern their child may die or be borne with complications.

"That issue of delay, they should be careful to see that a person will not manage and plan to operate immediately, but not that they first leave you to suffer. The baby may die or even be borne with some problems…" (Respondent from Rukungiri-Kisizi)

Adequate Quality of Care

Mothers differed on their opinions regarding the attitude and skill of the HCWs at the facilities. Some mothers stated the HCWs were very kind to them and they felt safe. These mothers also stated that felt the HCWs attended to them.

"When you are there, they take care of you. And they tell you that when you bleed a lot after delivering, please don't keep quiet. When you call them, say you have a problem, they come and help you". (Respondent from Kanungu-Bwindi)

Healthcare Workers Skill

However, some mothers expressed concerns about the skill level of HCWs at certain HCFs. They noted that some HCWs lacked experience and caused some concern for them in that if they had complications during their birth the HCWs were not prepared to help them.

Resource Challenges: Mothers noted that drugs were available at their facilities. However, mothers stated they have to bring own delivery kits or "mama kits". Mama kits included

materials such as soap, cotton, razors, polyethylene bedsheet, and towels. Mothers also noted that many of the HCFs had a shortage of beds and some mothers had to deliver on the floor.

> "…you would find like two mothers who are due to give birth, or even three women who are about to give birth and yet only two beds are available. (Respondent from Kanungu-Kihembe)

Chapter V-Discussion

Introduction

The purpose of this secondary data analysis of a mixed methods study was to assess the challenges western Ugandan mothers experienced when utilizing healthcare facilities. Further analysis was performed to examine any differences among the challenges women experienced based on regional district or type of health care facility. Overall, WASH status at the HCFs did differ between the districts as to whether or not there were handwashing stations outside the latrines, the presence of soap and water at the handwashing stations, whether or not there were latrines with pit covers, and the main source of water. Regarding challenges, the total sample reported expensive services as the most common challenge among western Ugandan mothers utilizing maternal health services in either district. For the subset of women who delivered at public HCFs, there was a statistically significant difference in the reporting of poor WASH services and expensive services as a challenge between the Kanungu and Rukungiri districts. Whereas, the mothers who delivered at PNFP or private facilities showed no differences between the non-WASH and WASH challenges at the HCFs in either district.

The quantitative analysis was then followed up by a secondary analysis of qualitative data (in-depth interviews), also collected by Makerere, to explore mother's perspectives on the challenges experienced while utilizing these HCFs in the two districts. Ten IDIs were analyzed in MAXQDA for thematic analysis. Four themes emerged from the qualitative data that included 1) awareness of WASH challenges 2) financial challenges 3) quality of care challenges and 4) resource challenges.

Major Findings from Quantitative Analysis

Most Common Challenge Western Ugandan Mothers Experienced While Utilizing HCFs

The most common challenge among western Ugandan mothers utilizing health services in either district was cost of services (6.1%). The sociodemographic characteristics among the mothers in regard to their occupation showed that most mothers from both districts were peasant farmers (74.5%) and the average household income was $35.2 USD per month. Therefore, many mothers were not wealthy, and cost could have easily been a challenge in utilizing HCFs.

The second most common challenge experienced among all the mothers was poor attitude of health workers (2.7%). Similarly, the systematic analysis conducted by Bouzid et al. (2018) found that the main reasons for mothers' dissatisfaction was HCWs attitudes and behaviors. Therefore, this challenge was reported in previous literature and is also highlighted within this data analysis as well.

Lastly, between the districts, two percent of women living in the Kanungu district experienced poor WASH challenges while utilizing a HCF compared to 0.3% of women living in the Rukungiri district (p=0.0300). Very little research has shown WASH to be a challenge for mothers when utilizing HCFs, as it is not often included in questionnaires or raised as a topic for discussion. This lack of inclusion of WASH does not mean that WASH is not a challenge but rather it is simply not assessed when engaging mothers on challenges experienced while utilizing HCFs.

WASH Status at HCFs Reported by Western Ugandan Mothers

The WASH status reported by mothers at the HCFs had differences between the districts. Ninety-six percent of women living in Kanungu had handwashing facilities outside the latrines at the HCF they utilized compared to the 99% of women living in the Rukungiri districts

(p=0.0023). Eighty-seven percent of women living in Kanungu had water and soap present at the handwashing stations outside the latrines at the HCF they utilized compared to the 92% of women living in the Rukungiri districts, (p=0.0310). Forty-seven percent of women living in Kanungu had latrines with pit covers at the HCF they delivered at compared to the 37% of women living in the Rukungiri districts, (p=0.0003). There also was a significant difference for main sources of water between these two districts (p<0.001). However, further analysis was not conducted to determine the differences between districts within each type of water source (e.g., protected springs and boreholes). These findings appear to contradict the WHO's multi country analysis on WASH in HCFs. Their report stated that the delivery of water was reported to be lowest in the Africa region, and 42% of all HCFs were lacking an improved water site either on site or nearby (WHO, 2015). In this study, over 64% of mothers in the Kanungu district and over 83% mothers in the Rukungiri district stated they had an improved water source at the HCF they utilized for delivery. Moreover, second to public taps/stand pipes, protected springs were the second highest reported water source at a HCF. One reason for this finding could be an issue of recall bias among the mothers making these findings less accurate. Meaning, some mothers may have overestimated the improved water source at the HCF. Furthermore, there were no questions on the survey about the maintenance and functionality of these WASH services. Therefore, mothers could have stated that the HCF had soap and a functioning water system at the time for handwashing stations but that could have been an exception to the normal status of both water and soap being unavailable. Lastly, within the Kanungu district, 49 out of 427 mothers (10.8%), and within the Rukungiri district, 19 out of 441 (4.3%) reported they did not know what the main water source was at the HCF they utilized.

WASH vs. Non-WASH Challenges Based on District and Type of HCF

For women who delivered at public HCFs there was a difference in poor WASH services as a challenge between the districts. Six percent of women living in Kanungu district experienced poor WASH challenges in a public HCF compared to 0.0% of women living in the Rukungiri district (p=0.0285). Women who utilized PNFP or private facilities did not have any significant differences between districts in regard to WASH or non-WASH challenges experienced when utilizing HCFs. There has been limited research on whether poor WASH services are associated with public versus private facilities. A literature review written by Songa at al. (2015) found that a report from the Ministry of Health in Uganda noted that poor and inadequate sanitation as well as a lack of water in HCFs was a major reason why mothers were dissatisfied with the quality of health services. The information that is lacking from the report by the Uganda Ministry of Health is whether or not the types of HCFs assessed were public or private, as this secondary analysis has shown a difference in WASH services between types of HCFs. Furthermore, the Steinmann et al. study also found a discrepancy in the WASH status, in regard to the number of latrines and handwashing stations at public versus private facilities. The WHO's Standard 8 quality of care focuses on essential physical resources being available at HCFs to improve quality of care. Therefore, an emphasis needs to be placed on WASH challenges in HCFs, particularly the differences in challenges among different types of HCFs.

Finally, for women who delivered at public HCFs there was a difference in expensive services as a challenge between the districts. Zero percent of women living in Kanungu district experienced expensive services as a challenge in a public HCF compared to 6.2% of women living in the Rukungiri district (p=0.0186). Given that private services cost money, women who are able to access those services would appear to be less likely to consider cost as a challenge.

Moreover, in Uganda public healthcare services are free, due to the elimination of user fees at all public health facilities. Presumably, the cost of services should not be seen as a challenge within these facilities (Musoke et al., 2014).

Major Findings from Qualitative Analysis

Four themes were found when analyzing the ten IDIs with mothers who had recently delivered from HCFs in either the Kanunugu or Rukungiri district. The four themes included 1) awareness of WASH challenges 2) financial challenges 3) quality of care challenges 4) resource challenges. Originally, the qualitative data was supposed to illuminate the findings from the quantitative data, but not enough mothers discussed WASH or other challenges to truly show a variety of reasons for why certain challenges were experienced when utilizing HCFs in these districts. Issues could have arisen from courtesy response, where mothers did not feel comfortable expressing their opinions on the difficulties that they experience with the maternal health services in their area. Furthermore, mothers might not be aware of their right to WASH in HCFs, especially since the WHO Standard 8 is relatively new. There is another possibility that mothers may not have improved water, sanitation, and hygiene at their homes, which leads them to not expect improved WASH services at the HCF.

Awareness of WASH Challenges

The theme of awareness of WASH challenges showed that mothers rarely mentioned WASH if not prompted by a specific WASH question on the interview guide. However, when prompted they did discuss a connection between poor WASH and infections. Interestingly, two mothers spontaneously began their own discussion of WASH as a challenge when they were just asked for suggestions on improving overall delivery services. The two mothers were discussing improvements for delivery services and noted it is important to have a consistent and safe water

source at all times within the HCF. These two mothers further noted that poor WASH conditions and poor hygiene can lead to infections both in the mothers and the neonates. The lack of spontaneous discussion about WASH may be due to various reasons. WASH may not have been defined or understood locally in Uganda in the same way that it is discussed in literature reviews and as WASH indicators, such as the WHO/UNICEF JMP indicators. Furthermore, these interviews were conducted in Lunyankole, the main language spoken in western Uganda, and there could have been language or translation barriers throughout the interviews and transcription process. WASH could have been interpreted differently among both the interviewers and participants.

Quality of Care Challenges

The theme regarding the quality of care challenges showed that mothers received delayed care at times from the HCWs. This challenge was most often mentioned as the most difficult aspects of their birthing experience were at a HCF. Delayed care led to worries among the mothers as they were concerned about complications during birth that potentially could lead to their newborn's death.

These themes should be noted for future IDIs to include questions on healthcare workers respect towards mothers as well as more questions in regard to the specific physical resources available and maintained at the HCFs. Furthermore, these themes tie into the WHO's Standards for Improving Quality of Maternal and Newborn Care in HCFs, specifically Standard's 7 and 8 that address HCFs providing component and available staff as well as essential physical resources, such as reliable WASH infrastructure. More research needs to be conducted on essential physical resources in different types of HCFs in developing countries to fully understand the WASH and non-WASH challenges women experience when utilizing HCFs.

Summary

Overall, the most common challenges western Ugandan mothers experienced when utilizing HCFs were cost of services and poor attitude of HCWs. WASH status at the HCFs did differ between the districts regarding whether or not there were handwashing stations outside latrines, there was a presence of soap and water at the handwashing stations, there were latrines with pit covers, and the main source of water. For women who delivered at public HCFs there was a difference in poor WASH services and expensive services as a challenge between the districts. Whereas, the mothers who delivered at PNFP or private facilities showed no differences between the non-WASH and WASH challenges at the HCFs. Four themes emerged from the qualitative data exploring western Ugandan mothers' perspectives on the WASH versus non-WASH challenges they experienced when utilizing maternal health services that included 1) awareness of WASH challenges 2) financial challenges 3) quality of care challenges and 4) resource challenges.

Limitations

There are limitations with conducting this secondary data analysis. First, a separate research team designed and conducted the questionnaire, interview guides, and focus group discussions. The secondary data analysis was restricted to the specific questions that could be asked within the data as the only information that could be analyzed had already been collected.

Moreover, the quantitative questionnaire was not administered as written. Instead, the response choices for some questions were read out individually requiring a "yes" or "no" to each response. This made the responses separate questions in of themselves. As a result, the SAS database showed more variables than what was expected from the initial questionnaire guide. This led to confusion when deciphering how the questionnaire was written versus how the

questionnaire was administered. Also, quite a few mothers chose the "other" option when discussing challenges they experienced at HCFs. Unfortunately, the original data did not include written answers for the "other" section, therefore the secondary analysis was unable to explain what these other challenges could have been.

Logistic regression was originally planned as part of the analysis to assess the relationship between poor WASH challenge as the dependent variable and various sociodemographic WASH status variables as the independent variables. However, since very few women stated yes to experiencing poor WASH as a challenge there was not enough power to conduct the regression.

Lastly, it is difficult to generalize the findings from this secondary data analysis, which involved a few hospitals in two districts to the WHO or Cronk and Bartram study that included over thousands of HCFs.

For the qualitative portion, the focus group discussions conducted by Makerere researchers were not analyzed for this thesis because they were not transcribed verbatim. Instead the data were summaries of participants' responses. For the in-depth interviews, at times the interviewer did not follow the question guide. This made it difficult to fully analyze the specific questions chosen to answer the qualitative research questions for this thesis.

Chapter VI- Public Health Implications

This secondary analysis did show that there are mothers who consider WASH as a challenge while utilizing HCFs, especially in regard to the type of HCF. Furthermore, the qualitative data showed that mothers do see the connection between poor WASH and the possibility of themselves or their newborn acquiring infections. The WHO/JMP WASH indicators need to fully assess not only WASH status in HCFs but also delve deeper into the status at different types of HCFs; given that this study shows there may be differences of WASH versus non-WASH challenges based on type of HCF utilized. The WHO Standards of Quality Care may need to not only incorporate in their frameworks and six strategic areas the quality statements that specifically address the challenges addressed in this study (e.g. poor WASH services and cost of services), but also ensure HCFs are implementing these quality standards in their patient care.

Future studies could focus on designing a mixed methods assessment to better understand the WASH versus non-WASH challenges that mothers experience utilizing HCFs and how mothers understand the WASH and its relation to healthcare. Overall, additional research is needed focusing on WASH and non-WASH challenges at HCFs and its effects on quality of care, maternal health, and on mothers' utilization of these services.

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APPENDIX 1

Structured Questionnaire
Part I: General information

No.	Prompt	Response
1.1	Date of interview	|___|___|2018
1.2	Questionnaire number	|__|__|__|
1.3	Parish	
1.4	Village	
1.5	District	1. Kanungu 2. Rukungiri
1.6	Start time	
1.7	Name of interviewer	

Part II: Socio-demographic characteristics of mothers

No.	Prompt	Response *(please circle)*
2.1.	How old are you? (Record age in completed years)	_____years
2.2.	What is your religion?	1= Catholic 2= Anglican 3= Muslim 4= Pentecostal/ Born again 5= Seventh Day Adventists (SDA) 6= Other (specify) _____
2.3.	What is your highest level of education you attained?	1= None 2= Primary (P1 to P7) 3= Secondary 4= Tertiary
2.4.	Parity [Number births]	_____
2.5.	Number of children alive	
2.6.	What is your marital status?	1= Single 2= Married/cohabiting 3= Widowed 4= Divorced/separated
2.7.	What is your occupation?	1=Peasant 2=Casual labourer 3=Business person 4=Salaried worker 5=Unemployed 6=Other (specify) _____

2.8.	How long have you lived in this village? (years)	_____ (months) _____ (years)
2.9.	What do you mainly use for lighting the house you live in?	1= Electricity 2= Solar 3= Kerosene lamp 4= Kerosene candle 5= Wax candle 6= Other (specify)
Wealth Index		
2.10.	What is the average monthly income of the HH head? (Uganda Shillings)	_____Uganda shillings
A) ASSET OWNERSHIP: Does your household have? (The asset has to be **FUNCTIONAL**)		
2.11.	A radio	1=YES 2=NO
2.12.	A mobile phone	1=YES 2=NO
2.13.	A Television	1=YES 2=NO
2.14.	A Motorcycle	1=YES 2=NO
2.15.	A Car	1=YES 2=NO
2.16.	A Bicycle	1=YES 2=NO
2.17.	A manufactured bed	1=YES 2=NO
2.18.	Apiece of land	1=YES 2=NO
2.19.	Large farm animals like cattle, goats and sheep	1=YES 2=NO
2.20.	Small farm animals like poultry	1=YES 2=NO
2.21.	Walls of main dwelling house permanent	1=YES 2=NO
DWELLING UNIT CONSTRUCTION AND CHARACTERISTICS (Observe)		
2.22.	B1=FLOOR MATERIAL	1=Earth 2= Earth And Dung 3=Parquet or Polished Wood 4= Mosaic or Tiles 5= Bricks 6=Cement 7=Stones 8=Concrete 9=Other (Specify)_____
2.23.	B2=WALL MATERIAL	1=Thatch/Straw 2=Mud and Poles 3=Un-Burnt Bricks 4=Un-Burnt Bricks with Plaster 5=Burnt Bricks with Mud 6=Cement Blocks 7= Stone 8= Timber 9=Burnt Bricks with Cement 10=Metal/ iron sheets

		11= Other (Specify)
2.24.	B3=ROOF MATERIAL	1=Thatch 2= Iron Sheets 3= Tiles 4=Others (Specify) _____
C1= ACCESS TO RESOURCES		
2.25.	**DRINKING WATER:** What is the main source of drinking water for members of your household?	1=Public taps/ stand pipes 2=Boreholes 3=Protected dug well 4=Unprotected dug well 5=Protected spring 6=Unprotected spring 7=Surface water (dams, lakes ,rivers, stream, ponds and canal 8=Covered rain water tank 9=Uncovered rain water tank 10=Cart with tank 11=Piped household water connection located inside the house, plot or yard 12=Other
2.26.	How long does it take to go to the water source, get water, and come back? (on foot)	_____in minutes
C2=SANITATION		
2.27.	Does your household have a latrine facility?	1=Yes 2=No (if No, go skip next question)
2.28.	**If yes**, what type of sanitation facility do you use? (If respondent has answered this, skip next question)	1=Flush toilet 2= VIP Latrine 3= Traditional pit latrine 4= Shared private 5= Public facility 6=Ecosan 7= Other (specify)
2.29.	**If No**, what do you use?	1= Shared public 2=Shared private 3=Open defecation/ Bush
C3=ENERGY		
2.30.	What type of fuel does your household **mainly** use for cooking? (Tick only one response)	1= Firewood 2= Charcoal/ briquettes 4=Gas 5= Biogas 6= Electricity 7=Kerosene/Paraffin 8=Straw/Shrubs/Grass 9=Animal Dung

		10=No Food Cooked In Household 11= Others (Specify)_____
2.31.	Do you have a separate room which is used as a kitchen?	**1=**Yes 2=No

Part III: Seeking of MCH services

3.1.	Did you ever seek MCH services during your most recent pregnancy from a health facility in this area? If No, go to 3.4.	1=Yes 2=No
3.2.	**If Yes**, which type of health facility did you seek MCH services from?	1=Public facility [name] _____ 2=PNFP facility [name] _____ 3=Private facility [name] _____
3.3.	Which MCH services did you seek from the nearby health facility during the most recent pregnancy?	ANC: 1=Yes 2=No Delivery services: 1=Yes 2=No Post-natal care: 1=Yes 2=No Neonatal care: 1=Yes 2=No Others (specify): 1=Yes 2=No
3.4.	Where did you deliver your youngest child? If delivery was not at a health facility skip to 3.15	1= Public Facility [name] _____ 2=PNFP facility [name] _____ 3=Private facility _____ 4=Traditional Birth Attendants (TBA) 5=At home 6=Others e.g. on the way to health facility (specify)_____
3.5.	What was the main reason for choosing the health facility for delivery?	
3.6.	What was the main reason for delivering your youngest child from the above facility? **(Circle only one reason)**	1=Short distance to the health facility 2=Availability of skilled health workers 3=Availability of medicines all the time 4=Good WASH services 5=Availability of adequate lighting 6=Availability of a caesarian section 7=Affordable cost of services 8=Others (specify)_____

<table>
<tr><td>3.7.</td><td>What were the other reasons for delivering your youngest child from the above facility? (Multiple choice responses)</td><td>1=Short distance to the health facility
2=Availability of skilled health workers
3=Availability of medicines
4=Good WASH services
5=Affordable cost of services
6=Others (specify)_____</td></tr>
<tr><td>3.8.</td><td>In case you are to deliver another child, would you deliver at the same health facility where you delivered your youngest child?</td><td>1= Yes
2= No</td></tr>
<tr><td>3.9.</td><td>If yes, why?</td><td>1=Short distance to the health facility
2=Availability of skilled health workers
3=Availability of medicines all the time
4=Good WASH services
5=Affordable cost of services
6=Others (specify) _____</td></tr>
<tr><td>3.10.</td><td>If no, why?</td><td>1=Long distance to the health facility
2=Lack of skilled health workers
3=Lack of medicines all the time
4=Poor WASH services
5=High cost of services
6=Others (specify) _____</td></tr>
<tr><td>3.11.</td><td>Would you recommend other mothers to seek delivery services from the facility where you delivered your youngest child?</td><td>1=Yes
2=No</td></tr>
<tr><td>3.12.</td><td>If yes, why?</td><td>1=Short distance to the health facility
2=Availability of skilled health workers
3=Availability of medicines all the time
4=Good WASH services
5=Affordable cost of services
6=Others (specify) _____</td></tr>
<tr><td>3.13.</td><td>If no, why?</td><td>1=Long distance to the health facility
2=Lack of skilled health workers
3=Lack of medicines all the time
4=Poor WASH services
5=High cost of services
6=Others (specify _____</td></tr>
<tr><td>3.14.</td><td>What was the water, sanitation and hygiene status in the health facility where you delivered your youngest child?</td><td><table><tr><td>Separate latrines for men and women</td><td>1=Yes</td><td>2=No</td></tr><tr><td>Hand washing facilities outside the latrine</td><td>1=Yes</td><td>2=No</td></tr></table></td></tr>
</table>

		Presence of water and soap for hand washing outside latrine	1=Yes	2=No
		Carried water from home to the health facility on the day of delivery	1=Yes	2=No
		Clean walls and floors in health facility	1=Yes	2=No
		Latrines with pit covers	1=Yes	2=No
3.15.	If delivery wasn't at a health facility, what was the main reason for not delivering your youngest child from the health facility? **(Circle only one reason)**	1= Poor WASH conditions at the health facility 2=Formal cost of treatment too much 3=Informal cost of treatment too much 4=Facility not open 5=Facility too far 6=No transport (Vehicle, boda boda, bicycle) available 7=No money for transport 8=Labour progressed too fast 9=Do not trust facility/poor quality of service 10= Do not trust facility/poor quality of service 11=Husband family did not allow 12=Not necessary to deliver in a H/facility 13=No provider at the facility 14=Did not have required supplies (gloves, mackintosh etc.) 15=TBA's accessibility 16=Others specify		
3.16.	What were the other reasons for not delivering your youngest child from ------ health facility? (Refer to health facility at 3.4) **(Multiple choice responses)**	1= Poor WASH conditions at the health facility 2=Formal cost of treatment too much 3=Informal cost of treatment too much 4=Facility not open		

		5=Facility too far 6=No transport (Vehicle, boda boda, bicycle) available 7=No money for transport 8=Labour progressed too fast 9=Do not trust facility/poor quality of service 10=No female provider at the facility 11=Husband family did not allow 12=Not necessary to deliver in a H/facility 13=No provider at the facility 14=Did not have required supplies (gloves, mackintosh etc.) 15=TBA's accessibility 16=Others specify
3.17.	In case you are to deliver another child, would you make a change from Home/TBA to a health facility?	1= Yes 2= No
3.18.	If yes in 3.16 above, give reasons.	…… …… …… …… ……..
Nearest Health Facility		
3.19.	What is your nearest health facility that offers MCH services?	[Name] _____ [Level] _____
3.20.	Distance to nearest health facility that offers MCH services?	[Km] _____
3.21.	What type of transport means do you use to get to the nearest facility that offers delivery services? **(If respondent walks, skip 3.22).**	1=Walking 2=Bicycle 3=Motorcycle 4=Car 5=Other (specify)
3.22.	How much do you pay to use the above transport means?	
3.23.	How long does it take to walk to the nearest health facility that offers MCH services?	1=Less than 30 minutes 2=Between 30 min- 1hr 3=Between 1hr-2hrs

<table>
<tr><td></td><td></td><td>4=More than 2hrs</td></tr>
<tr><td>3.24.</td><td>Does nearest health facility offer these MCH services? Ask about the following, and circle all that apply:</td><td>
<table>
<tr><td>Antenatal care</td><td>1=Yes</td><td>2=No</td></tr>
<tr><td>Delivery services</td><td>1=Yes</td><td>2=No</td></tr>
<tr><td>Newborn care</td><td>1=Yes</td><td>2=No</td></tr>
<tr><td>Theatre services</td><td>1=Yes</td><td>2=No</td></tr>
<tr><td>Incubator</td><td>1=Yes</td><td>2=No</td></tr>
<tr><td>Postnatal care</td><td>1=Yes</td><td>2=No</td></tr>
<tr><td>Immunization</td><td>1=Yes</td><td>2=No</td></tr>
<tr><td>Family planning</td><td>1=Yes</td><td>2=No</td></tr>
</table>
</td></tr>
<tr><td>3.25.</td><td>How often are immunization services offered at the nearest health facility?</td><td>1=Daily
2=Twice a week
3=Once a week
4=Twice a month
5=Once a month
6=Others (specify) _____</td></tr>
<tr><td>3.26.</td><td>To what extent does distance to the health facility influence your choice to seek delivery services?</td><td>1=Does not influence
2=Somehow influence
3=Greatly influence</td></tr>
<tr><td>3.27.</td><td>When are delivery services offered at the nearest health facility?</td><td>1=Day
2=Night and Day
3=Not offered
4=Don’t know</td></tr>
<tr><td>3.28.</td><td>Are you able to access the health worker at the nearest health facility whenever you need to?</td><td>1=Yes
2=No
3=Don’t know</td></tr>
<tr><td colspan="3">Part IV: Water, Sanitation and Hygiene (WASH)</td></tr>
<tr><td>4.1.</td><td>What is the main source of water at the nearest public health facility that offers delivery services?</td><td>1=Public taps/ stand pipes
2=Boreholes
3=Protected dug well
4=Unprotected dug well
5=Protected spring
6=Unprotected spring
7=Surface water (dams, lakes ,rivers, stream, ponds and canal)
8=Rain water tank
9=Cart with tank / water vendor
10=Piped health facility water connection located inside the house, plot or yard
11=Don’t know
12=Other (specify)</td></tr>
</table>

4.2.	To what extent does the **Availability of Water** at the health facility influence your choice to seek MCH services?	1=Does not influence 2=Somehow influences 3=Greatly influence
4.3.	To what extent are you satisfied with the water situation at the health facility you visit?	1=Very satisfied 2=Satisfied 3=Neutral 4=Dissatisfied 5=Very dissatisfied
4.4.	If satisfied, what are the reasons for your satisfaction?	1= Availability of adequate water at the health facility 2=Reliable water points (such as taps, boreholes, rain water harvesting tanks e.t.c) 3=Availability of drinking water at the health facility 4= Availability of hand washing facilities with soap and adequate water 5=Free of stagnant water 5=Others.....
4.5.	If dissatisfied, what are the reasons for your satisfaction?	1= Inadequate water at the health facility 2=Unreliable water points (such as taps, boreholes, rain water harvesting tanks e.t.c) 3=Lack of drinking water at the health facility 4= Lack of hand washing facilities with soap and adequate water 5=Presence of stagnant water 5=Others.....
4.6.	To what extent does the Availability of clean latrines/toilets at the health facility influence your choice to seek MCH services?	1=Does not influences 2=Somehow influences 3=Greatly influences
4.7.	To what extent are you satisfied with the Availability of clean latrines/toilets at the health facility you visit?	1=Very satisfied 2=Satisfied 3=Neutral 4=Dissatisfied 5=Very dissatisfied
4.8.	If satisfied, what are the reasons for your satisfaction?	1= Availability of Water 2=Availability of clean latrines/toilets 3=Availability of hand washing facilities with soap 4= Clean environment such as wards 5=Availability of anal cleansing materials 6=Toilet is free of foul smells 7=Others.....

4.9.	If dissatisfied, what are the reasons for your satisfaction?	1= Inadequate access to Water 2=Dirty latrines/toilets 3=Lack of hand washing facilities with soap 4= Dirty environment such as wards 5=Lack of anal cleansing materials 6=Toilet has a foul smell 7=Others.....
4.10.	To what extent does the Availability of hand washing facilities influence your choice to seek MCH services from a health facility?	1=Does not affect 2=Somehow affects 3=Greatly affects
4.11.	To what extent are you satisfied with the Availability of hand washing facilities at the health facility you visit?	1=Very satisfied 2=Satisfied 3=Neutral 4=Dissatisfied 5=Very dissatisfied
4.12.	If satisfied, what are the reasons for your satisfaction?	1= Availability of soap 2=Availability of running water 3=Proximity to the latrine facility 4= Availability of clean water 5=Others.....
4.13.	If dissatisfied, what are the reasons for your dissatisfaction?	1= Lack of adequate soap 2=Lack of running water 3=Lack of proximity to the latrine facility 4= Inadequate clean water 5=Others.....
4.14.	To what extent are you satisfied with the cleanliness of the health facility you usually visit?	1=Very satisfied 2=Satisfied 3=Neutral 4=Dissatisfied 5=Very dissatisfied
4.15.	If satisfied, what are the reasons for your satisfaction?	1= Regular cleaning of the health facility 2=Clean compound/ health facility 3=No rubbish in the compound 4= Availability of solid waste containers at HF 5=Clean health workers 6=Others.....
4.16.	If dissatisfied, what are the reasons for your dissatisfaction?	1= Irregular cleaning of the health facility 2=Dirty compound/ health facility 3=Indiscriminate waste disposal 4= Lack of solid waste containers at HF 5=Dirty health workers 6=Others.....

4.17.	To what extent does the cleanliness of a health facility influence your decision to deliver from there?	1=Does not influence 2=Somehow influence 3=Greatly influence
4.18.	Do you make any financial contribution towards water services at the health facility you visit?	1=Yes 2=No
4.19.	If yes, specify how much	_____Quantity_____
Part V: Challenges accessing delivery services (For those who delivered at the HF)		
5.1.	Do you make any financial contribution towards delivery services at your facility of choice?	1= Yes 2= No
5.2.	If yes, specify how much and for what?	_____
5.3.	What challenges did you experience when you delivered your last baby?	1=Poor WASH services 2=Unskilled birth attendants 3=Long waiting in long lines 4=Poor health-worker attitude 5=Expensive services 6=Others (specify) _____
5.4.	To what extent are you satisfied with the delivery services at the health facility where you delivered?	1=Very satisfied 2=Satisfied 3=Neutral 4=Dissatisfied 5=Very dissatisfied 6=Not Applicable (Didn't deliver at health facility)
5.5.	If satisfied, what are the reasons for your satisfaction?	1=Availability of water 2=Availability of clean latrines 3=Clean environment 4=Availability of hand washing facilities 5=Availability of utilities (electricity etc.,) 6=Skilled birth attendants 7=Short/no waiting in long lines 8=Good health-worker attitude 9=Affordable services 10=Availability of medicines and supplies 12=Others (Specify) _____
5.6.	If dissatisfied, what are the reasons for your dissatisfaction?	1=Lack of water 2= Lack of clean latrines 3= Dirty environment 4= Lack of hand washing facilities 5= Lack of utilities (electricity etc.,)

		6= Lack of skilled birth attendants 7=Long waiting in long lines 8=Poor health-worker attitude 9=Expensive services 10= Lack of medicines and supplies 12=Others (Specify) _____
(5.7 to 5.12 applies for those who did not deliver at health facilities)		
5.7.	Do you make any financial contribution towards delivery services at your facility of choice?	1= Yes 2= No
5.8.	If yes, specify how much and for what?	_____
5.9.	What challenges did you experience when you delivered your last baby?	1=Poor WASH services 2=Unskilled birth attendants 3=Long waiting in long lines 4=Poor health-worker attitude 5=Expensive services 6=Others (specify) _____
5.10.	To what extent are you satisfied with the delivery services at the health facility where you delivered?	1=Very satisfied 2=Satisfied 3=Neutral 4=Dissatisfied 5=Very dissatisfied 6=Not Applicable (Didn't deliver at health facility)
5.11.	If satisfied, what are the reasons for your satisfaction?	1=Availability of water 2=Availability of clean latrines 3=Clean environment 4=Availability of hand washing facilities 5=Availability of utilities (electricity etc.,) 6=Skilled birth attendants 7=Short/no waiting in long lines 8=Good health-worker attitude 9=Affordable services 10=Availability of medicines and supplies 12=Others (Specify) _____
5.12.	If dissatisfied, what are the reasons for your dissatisfaction?	1=Lack of water 2= Lack of clean latrines 3= Dirty environment 4= Lack of hand washing facilities 5= Lack of utilities (electricity etc.,) 6= Lack of skilled birth attendants 7=Long waiting in long lines 8=Poor health-worker attitude

		9=Expensive services 10= Lack of medicines and supplies 12=Others (Specify) _____
5.13.	Would you deliver at the nearest health facility that offers delivery services in future?	1= Yes 2= No
5.14.	If yes, why?	1=Short distance to the health facility 2=Availability of skilled health workers 3=Availability of medicines all the time 4=Good WASH services 5=Affordable cost of services 6=Others (specify) _____
5.15.	If no, why?	1=Long distance to the health facility 2=Lack of skilled health workers 3=Lack of medicines all the time 4=Poor WASH services 5=High cost of services 6=Others (specify) _____
5.16.	Would you recommend other mothers to seek delivery services from the nearest facility that offers delivery services?	1=Yes 2=No
5.17.	If yes, why?	1=Short distance to the health facility 2=Availability of skilled health workers 3=Availability of medicines all the time 4=Good WASH services 5=Affordable cost of services 6=Others (specify) _____
5.18.	If no, why?	1=Long distance to the health facility 2=Lack of skilled health workers 3=Lack of medicines all the time 4=Poor WASH services 5=High cost of services 6=Others (specify _____
5.19.	Does your household income affect the choice of where to deliver in this community?	1=Yes 2=No
5.20.	What are the important elements for you in a health facility that offers delivery services? [**In order of importance**].	1=WASH services availability |__| 2=Skilled health workers |__| 3=Good attitude of health workers |__| 4=Good Infrastructure |__| 5=Availability of drugs/other supplies |__| 6=Affordable costs |__| 7=Others (specify) |__| _____

5.21.	What are your suggestions in improving delivery services at the nearest health facility?	

END TIME: _____

APPENDIX 2

Health seeking behavior study - In-depth interviews (IDI) (mothers delivered in the last 1 month)

1. ICE-BREAKER: How old is this/your baby?
2. Where did you deliver this baby from? Why? What is your experience?
3. How far is the nearest health facility offering delivery services?
4. What other services are offered at your nearest health facility?
5. What challenges did you face when you delivered this baby? Probe for distance to health facility, skilled health workers, poor attitude of health workers, availability of medicines and supplies, cost of services at the facility, household income. Why do you think some mothers do not deliver at health facilities?
6. Do you pay for delivery services at the nearest health facility? If yes, how much, and for what?
7. In this community, what kind of families/households are considered to be wealthy/rich? Where do mothers who are wealthy/rich in this community deliver from?
8. Are you satisfied with the delivery services at the nearest health facility? If yes/no, give reasons. Would you consider delivering at the nearest health facility in future? Would you recommend a friend to deliver at the nearest health facility? If yes/no, why?
9. What are the important elements for you in a health facility that offers delivery services?
10. How does WASH services at health facilities influence your choice of health facility to deliver from?
11. What are your suggestions in improving delivery services at the nearest health facility?

APPENDIX 3

Health seeking behavior study - Focus group discussions' (FGDs) Guide

1. ICE-BREAKER: Where do women in this community deliver from? Why?
2. How far is the nearest health facility offering delivery services? What other services are offered at your nearest health facility
3. What challenges do women face when seeking for delivery services? Probe for distance to health facility, skilled health workers, poor attitude of health workers, availability of medicines and supplies, cost of services at the facility, household income. Why do you think some mothers do not deliver at health facilities?
4. Do you pay for delivery services at the nearest health facility offering MCH services? If yes, how much, and for what?
5. In this community, what kind of families/households are considered to be wealthy/rich? Where do mothers who are wealthy/rich in this community deliver from?
6. Are you satisfied with the delivery services at the nearest health facility? If yes/no, give reasons. Would you consider delivering at the nearest health facility in future? Would you recommend a friend to deliver at the nearest health facility? If yes/no, why?
7. What are the important elements for you in a health facility that offers MCH services?
8. What are your suggestions in improving delivery services at the nearest health facility?

APPENDIX 4

Health seeking behavior study - Key Informants' Interview guides

a) Guide for Health workers

1. Do you offer delivery services at this health facility? What other services are offered at this health facility?
2. As a health worker, what is your experience of delivery services at this health facility?
3. Where do most women in this community deliver from? And why?
4. What challenges do women in this community face in accessing delivery services? Probe for distance to health facility, skilled health workers, poor attitude of health workers, availability of medicines and supplies, cost of services at the facility, household income. Why do you think some mothers do not deliver at health facilities?
5. Do you think delivery services at this facility meet the community's needs? If yes/no, why? Is the community satisfied with delivery Services at this facility? If yes/no, why?
6. Where do wealthy/rich woman in this community deliver from?
7. Do you think WASH at health facilities has an influence on health seeking behavior of mothers? If no/yes, why?
8. What factors would enable women in this community to access and utilize delivery services?
9. What are the important elements for you in a health facility that offers delivery services?
10. What are your recommendations for improving delivery services in this community?

b) Other Key informant interviews

1. What is the nearest health facility in this community? What services are offered at the nearest health facility?
2. Tell me about the MCH services in this community. What is your experience of delivery services in this community?
3. Where do most women in this community deliver from? And why?
4. What challenges do mothers in this community face in accessing delivery services? Probe for distance to health facility, skilled health workers, poor attitude of health workers, availability of medicines and supplies, cost of services at the facility, household income. Why do you think some mothers do not deliver at health facilities?
5. Where do wealthy/rich woman in this community deliver from?
6. Do you think WASH at health facilities has an influence on health seeking behavior of mothers? If no/yes, why?
7. What factors would enable women in this community to access and utilize delivery services?
8. What are your recommendations for improving delivery services in this community?
9. What are the important elements for you in a health facility that offers delivery services?
10. What are your suggestions for improving delivery services in this community?