Assessment of the status of Water, Sanitation and Hygiene in Healthcare Facilities in the Greater Kampala Metropolitan Area

Final Report

A joint study by Makerere University School of Public Health, Emory University, and WaterAid Uganda with technical assistance from the Ministry of Health Uganda.

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Acronyms

GKMA	Greater Kampala Metropolitan Area
HCF	Health Care Facility
PNFP	Private Not for Profit
LMICs	Low Middle Income countries
UDHS	Uganda Demographic Health Survey
UNICEF	United Nations Children's Fund
VIP	Ventilated Improved Pit latrine
WASH	Water, Sanitation and Hygiene
WASHCon	WASH Conditions
WHO	World Health Organization

Operational definitions

Term/Phrase	Definition
Access	The WHO/UNICEF (2010) definition for access was adopted. Access to WASH refers to a proportion of the population using an improved sanitation facility and improved drinking water source.
Greater Kampala Metropolitan Area (GKMA)	Refers to the Districts of Kampala, Mukono and Wakiso
Hospital acquired infections	An infection acquired in a hospital by a patient who was admitted for a reason other than that infection. It also includes infections occurring in a patient in a hospital or other healthcare facility in whom the infection was not present or incubating at the time of admission.
Improved Sanitation	Is the use of facilities that ensure hygienic separation of human excreta from human contact and they include: flush/pour flush to piped sewer system, septic tank or pit latrine; ventilated improved pit (VIP) latrine; pit latrine with slab and composting toilet.
Improved Water source	Is one that by the nature of its construction is adequately protected from outside contamination, in particular with faecal matter. It is expected to provide water of better quality and with greater convenience than traditional "unimproved" sources.
Rural	A geographic area that is located outside towns and cities
Sanitation	A group of methods to collect human excreta and urine in a hygienic way, where human and community health is not altered
Water quality	In this study, water quality refers to the microbial, physical and chemical characteristics of drinking water in line with the WHO/UNICEF (2010)

	definition.
Water, sanitation and hygiene conditions	Refers to the types, accessibility, functionality status, quality and reliability of water, sanitation and hygiene facilities.
Water, sanitation and hygiene infrastructures	Refers to the water, sanitation and hygiene facilities or systems.
Water, sanitation and hygiene practices	Refers to the behaviour of people in terms of utilization, operation and maintenance of water, sanitation and hygiene facilities or systems.
Water supply	Includes the supply of water for domestic and institutional purposes, including drinking, food preparation, cleaning, personal hygiene as well as activities in the health facility setting.

Abstract

Background: Access to safe water, sanitation and hygiene (WASH) is critical for infection prevention and control especially in health facilities. Often, neonates and their mothers are particularly vulnerable to infections that are transmitted due to poor WASH conditions. Information on the status of WASH in health facilities in many developing countries, Uganda inclusive is scanty yet new-born mortality rate remains as high at 27 deaths per 1,000 live births, of which 31% of these deaths are due to neonatal sepsis.

Methods: A cross-sectional study was used to assess the WASH status and associated factors in health care facilities (HCFs) in the GKMA so as to inform appropriate models for sustainable WASH in HCF. Specifically, we established the status of WASH (i.e. water supply and quality, sanitation, hand hygiene, solid waste management and cleaning), behaviours of health practitioners and mothers as well as management systems for WASH sustainability in HCFs. Study units included the HCFs in Kampala, Wakiso and Mukono districts. Sixty percent of the HCFs (63 out of 105 HCFs) at the 3 levels of hospital, HC IV and HC III were studied. The sampling included all the hospitals and HC IVs due to their handling of majority of maternity and neonatal issues and sample about half of the HC III focusing largely on government and private not for profit hospitals. Data collection was conducted using the WASH Conditions (WASHCon) tool on a Commcare mobile application comprised of interviews with key informants in the HCFs, observations and water quality analysis. Water samples were tested for total and faecal coliforms, i.e. E. coli using the most probable number method. Quantitative data was entered in ODK software suing mobile phones and exported to SPSS version 23 and STATA version 14 for analysis. Data was analysed using both descriptive and inferential statistics, mainly parametric tests. For WASHCon the data was analysed using R and A dashboard created with the summary WASHCon scores, JMP results and individual facility reports generated. A Chi-square test was used to assess association between predictors outcome variable. Qualitative data from FGDs and interviews was analysed using content analysis and findings were triangulated with quantitative results.

Findings: This study revealed that 48.1% of the health care facilities had limited water service; 85.2% had limited sanitation service; more than half (51.9%) had limited environmental

cleanliness service; 57.4% had limited hand hygiene service, and 53.7% had limited healthcare waste management service. The factors associated with water service status included; the level of health care facility ($\chi 2$ (4) =15.103, p=0.004); ownership ($\chi 2$ (2) =6.00, p=0.050); regular staff appraisal on performance ($\chi 2$ (2) =6.361, p=0.042); frequent communication between the in charge and maintenance staff about WASH issues ($\chi 2$ (2)=09.828, p=0.007); undertaking regular audits in wards to establish availability of hand sanitizer and soap ($\chi 2$ (2) =6.843, p=0.033) and presence of a clearly visible and legible up-to-date diagram of the facility management structure ($\chi 2$ (2) =8.864, p=0.012). Health care waste management status was associated with having a dedicated infection control focal person or committee ($\chi 2$ (2) = 7.630, p=0.022); training of all staffs involved in cleaning on WASH ($\chi 2$ (2) =12.855, p=0.012). The environmental cleanliness status was statistically significantly associated with availability of cleaning protocols ($\chi 2$ (2) = 6.071, p=0.048); regular communication between the in charge and maintenance staff on issues regarding WASH ($\chi 2$ (2) =6.383, p=0.041); undertaking regular audits to assess availability of hygiene supplies such as soap and sanitisers ($\chi 2$ (2) =10.551, p=0.005); training of health care personnel on infection prevention and control (IPC) as part of their orientation program ($\chi 2$ (2) =7.329, p=0.026); training of all staffs involved in cleanings ($\chi 2$ (4) =13.982, p=0.007); and annual training of all health care personnel on infection control ($\chi 2$ (4) =11.074, p=0.004). Conversely, hygiene status of health care facilities was statistically significant associated with having a clear and legible job description ($\chi 2$ (2) = 6.163, p=0.046). Regarding WASH practices and behaviours; this study revealed that health care facilities were cleaned between 2-3times daily. Waste management was characterised by indiscriminate waste disposal and delays in collecting medical wastes. Clients seeking health care exhibited poor hygiene practices, including hand washing. In line with WASH management systems, only 43.1% of HCFs had cleaning protocols; only 41.5% had written policies and protocols relating to cleaning the delivery room available within the facility; only 6.2% of HCFs where someone has tested and/or monitored the water quality within the facility, and 47.7% of the HCF had provided orientation on infection prevention and control (IPC) to their cleaners and maintenance personnel. Facility specific reports are appended and also, they can be downloaded on: https://ywan446.shinyapps.io/Uganda_WaterAid/.

Chapter One

1.1. Introduction and background

Water, sanitation and hygiene (WASH) in health care facilities (HCFs) are fundamental for the provision of quality health care. Good WASH infrastructure and practices in HCFs should reduce health care-related infections, increase trust and uptake of healthcare services, increase efficiency and improve staff morale. All major initiatives to improve global health depend on basic WASH services in HCFs. Yet, many HCFs in low- and middle-income countries lack basic WASH infrastructure. Data from 54 countries indicate that 38% of HCFs do not have an improved water source, 19% do not have improved sanitation and 35% do not have water and soap for hand-washing (WHO and Unicef, 2015). This lack of infrastructure compromises the ability to provide safe and quality health care and places both those providing and those seeking health care at considerable and preventable risk. Sustainable Development Goal #6 includes a target to achieve universal access to basic drinking water, sanitation and hygiene for households, schools and HCFs, by 2030, but there is little evidence about the health impact of improved WASH infrastructure and practices in HCFs.

Mothers who give birth in HCFs are at risk of infection because of lack of WASH infrastructure coupled with unsafe hygiene practices, and this risk increases if a caesarean section is needed. The World Health Organization (WHO) reports that every day approximately 8 women die from preventable diseases related to pregnancy and childbirth, with 99% of deaths occurring in developing countries (WHO, 2018). Preventable infections cause 36% of maternal mortality (Alkema et al., 2016). Caesarean section is the biggest risk factor for postpartum puerperal sepsis infection (van Dillen et al., 2010). Research linking poor WASH conditions within HCFs in the developing world to maternal infection and mortality is almost non-existent. Environmental conditions within HCFs also impact new-born health. The WHO reports “new-borns are at higher risk of acquiring health care-associated infection in developing countries, with infection rates three to twenty times higher than in high-income countries” (WHO and Unicef, 2015, Alkema et al., 2016). A study in Nigeria, reported 6.5 cases of neonatal sepsis per 1000 live births in a referral hospital (Airede, 1992), and 21 cases of neonatal sepsis per 1000 live births were reported from a referral hospital in Zimbabwe (Nathoo et al., 1990). Furthermore,

healthcare-acquired infections in neonates in low income countries are far more likely to be caused by anti-microbial resistant pathogens and are more challenging to treat (Zaidi et al., 2005). Therefore, it is critical to focus on infection prevention especially through improvements of environmental conditions including WASH in HCFs. Unfortunately, the status of WASH in many low-income countries including Uganda is neither known nor documented.

Chapter Two

2.1. Literature review

2.1.1. WASH conditions in Health care facilities

Many HCFs do not have access to fully functioning WASH services, but even in countries where these do exist, adherence to hand washing remains a very big challenge in all healthcare settings and among all types of staff (Larson and Kretzer, 1995). The overall average adherence from both developed and developing countries is 39% (WHO, 2011). Some of the factors for poor adherence to hand hygiene include personal comfort; real or perceived lack of access to infrastructure and products; lack of knowledge or scepticism about the value of hand washing; and lack of institutional guidelines for how and when to wash hands (WHO, 2011).

A survey on WASH which involved 54 low- and middle-income countries showed that 38% of HCFs do not have an improved water source, 19% do not have improved sanitation and 35% do not have water and soap for hand washing (WHO and Unicef, 2015). In some countries, for example Kenya, the nationwide estimate of access to WASH services in HCFs is high (83%). However, some districts within a country can have coverage estimates that are lower than the national average by a factor of two or three (WHO and Unicef, 2015). Another study in Bangladesh on hygiene found that healthcare workers utilized only 46% of hand washing opportunities and only 2% resulted in recommended hand washing practice i.e. use of soap or sanitizer (ICCDR, 2014).

In another assessment of nine Honiara district clinics in the Solomon Islands, 67% of HCFs had insufficient water quantity for their daily needs and identified the presence of potentially infectious wastewater from bathing, cleaning or laundry (WHO and UNICEF, 2012). In Zanzibar, Tanzania it was found that the availability of infrastructure for hand washing was poor, especially in small HCFs, also over 30% of HCFs had no functional hand washing station. Water availability and quality were both found to be major issues especially in maternity units without a theatre (Ali et al., 2015). Reported practices on some of the five key moments for hand hygiene were poor. Concerning environmental hygiene, low levels of cleanliness of

delivery beds, client toilets and cleaning equipment were found. Of particular concern was the finding that 73% of HCFs reported not performing cord preparation before cord cutting (Ali et al., 2015).

2.2. Effects of poor WASH status in health care facilities

Inadequate access to WASH services in HCFs in many low and middle-income countries affects the ability to provide basic services such as child services and ability to prevent and control infections. Inadequate access to WASH services in HCFs causes up to 56% of all neonatal deaths among hospital-born babies in developing countries, with three quarters occurring in South-East Asia and sub-Saharan Africa (WHO, 2011). It is estimated that of every hundred hospitalized patients, seven in developed and ten in developing countries will acquire health care-associated infections (WHO, 2011). The benefits of water and sanitation include diarrhoeal diseases averted, other infections prevented, better nutrition, financial and economic savings, and improved education, especially for girls (Bartram and Cairncross, 2010).

WASH in health care facilities remains a public health challenge. In their study about the WASH status of childbirth environments across low and middle-income countries in health facilities, Gon et al. (2016) points out that access to water and sanitation during childbirth is poor across low and middle-income countries, and that mothers are not guaranteed access to basic WATSAN infrastructure during delivery (Gon et al., 2016).

The prevalence of hospital acquired infections in several low and middle-income countries is high compared to USA and Europe. A systematic review on the burden of hospital-acquired infections in developing countries reported a prevalence of 15.5%, which is much higher than what is reported in the USA and Europe (Allegranzi et al., 2011). At the population level, the burden of sepsis contributes about 10-15% of maternal deaths and 16% of new-born deaths (Kassebaum et al., 2014). The burden of infections is especially high in new-born children. Sepsis and other severe infections are major killers estimated to cause 430,000 deaths annually. The risks associated with sepsis are 34 times greater in low resource settings (Oza et al., 2014).

Faecal-oral infections driven by poor access to domestic and personal hygiene (for example lack of hand washing by the person assisting labour) can lead to sepsis (Ali et al., 2006). Hand

hygiene is currently considered the primary measure necessary for reducing healthcare associated infections (WHO, 2014).

2.2.1. WASH status in health facilities

In study to determine coverage estimates of environmental conditions and standard precaution items in 78 Low Middle Income countries (LMICs), Cronk and Bartram (2018) reported that 50% and 33% of HCFs lacked piped water and improved sanitation respectively. In addition, 39% did not have soap for handwashing, 39% lacked adequate infectious waste disposal, 73% did not have sterilization equipment. This study also revealed that only 2% of HCFs provided all four of water, sanitation, hygiene, and waste management services, provision of these services was statistically associated with location of the health care facility, ownership/ managing authority and facility type.

In a survey to assess WASH service availability in 50 health care facilities across 4 districts in rural southwestern Uganda, (Mulogo et al., 2018) reported that 94% of health care facilities had improved water sources while 96% had improved toilet facilities. The study also revealed that hospitals had the poorest toilet to patient ratio (1: 63). Regarding availability of hand washing facilities, only 38% of the health care facilities were observed to have them at the toilet facilities whereas 76% had them at other points other than the toilet facilities. Both water and soap were present at only 24% of these health care facilities. However, this assessment did not take into consideration the JMP service ladders.

Regarding water quality, a study conducted in health care facilities in Rwanda in pointed out that three of 18 drinking water samples collected in the different health facilities met the WHO guideline for free chlorine residual of >0.2 mg/l. In addition, 6 of 16 drinking water samples analysed for total coliforms met the WHO guideline of <1 coliform/100 mL while 15 of 16 drinking water samples analysed for E. coli met the WHO guideline of <1 E. coli/100 mL. In the same study, the HCF staff reported treating up to 20 L of drinking water per day. In addition, over 60% of water access points (160 of 267) were observed to be functional, 32% of hand washing locations (46 of 142) had water and soap and 44% of sanitary facilities (48 of 109) were in hygienic condition and accessible to patients. The study reported regular maintenance of WASH infrastructure consisted of cleaning. However, it also acknowledged that none of the HCF had an on-site capacity for performing repairs (Huttinger et al., 2017).

2.2.2. Factors associated with WASH status at health care facilities

Regarding factors associated with the WASH status in health care facilities in LMICs, Cronk and Bartram (2018) reported location of the health care facility (rural vs urban), managing authority, facility type, and sub-national administrative unit as statistically significant predictors. The study revealed that NGO-managed HCFs had significantly higher odds of having a basic water service as compared to government-managed facilities; facility types other than hospitals (e.g. clinics, dispensaries) either had no significant difference from hospitals or had significantly lower odds of having a basic water service and that health centres, health posts, and health houses had significantly lower odds of having a basic water service as compared to hospitals. Regarding the effect of location on access to a water service, the authors noted that there was a significant association between the availability of a basic water service and urban-rural setting.

A survey conducted in rural south western Uganda indicated that the lack of hand washing facilities was most prominent at the level IV health centre toilets (Mulogo et al., 2018). Mulogo et al. (2018) also noted that that the sanitation status of the available toilet facilities was poor, and that it was related to the capability to close and lock the toilet and the availability of lighting in the toilet area. Regarding hygiene facilities, availability of hygiene facilities (hand washing amenities and messages) was very limited in the health care facilities irrespective of level and ownership.

2.2.3. WASH practices and behaviours for health practitioners

A qualitative study, using narrative interviews (nine focus groups and one individual interview) among medical students', junior doctors' and medical educators' revealed that a discrepancy in WASH knowledge and behaviours among the groups (Cresswell and Monrouxe, 2018). The study revealed that WASH related knowledge varied across participant groups and appeared to influence behaviours; to be specific medical students relied on what they have been told by seniors, while medical educators relied on their own knowledge and experience. The study also revealed that there was a strong belief that evidence for the effectiveness of good hygiene behaviours is lacking. Furthermore, medical educators' behaviour appeared to strongly influence others (Cresswell and Monrouxe, 2018).

CHAPTER THREE

3.1. Problem statement, Justification and Research Objectives

3.1.1. Problem statement

Safe and adequate environmental sanitation in HCFs, including the availability of improved water, sanitation, hygiene is essential for the protection of patients (especially mothers and neonates) from infections especially sepsis (Cronk and Bartram, 2018). In HCFs, neonates and their mothers are particularly vulnerable to infections that are transmitted due to poor environmental conditions especially limited access and availability of water or use of unsafe water sources and unsafe stored water (Moffa et al., 2017).

Unfortunately, the status of WASH in low income countries like Uganda is neither known nor documented, and yet many children and mothers continue to suffer risk due to hospital acquired infections. According to the Uganda demographic health survey (UDHS), new-born deaths in Uganda constitute over 38% of all infant deaths. Despite the different interventions implemented over the years, the new-born mortality rate is still high at 27 deaths per 1,000 live births (UBOS and ICF, 2017), and new-born sepsis contributes to 31 % of that mortality. The burden of maternal and neonatal sepsis and other nosocomial infections in the GKMA is not known. The WASH status in the HCFs in the GKMA is also not known. Therefore, this study sought to assess the WASH status, associated factors and management systems for WASH sustainability in government and Private not for profit (PNFP) HCFs in Kampala and Metropolitan areas to gather evidence to support advocacy and identify priority areas to support programmatic implementation for system change.

3.1.2. Research questions

1) What is the status of WASH (water supply and quality, sanitation, hygiene, waste management and cleaning routines) in HCFs in greater Kampala Metropolitan areas?
2) What factors are associated with status of WASH in HCF in greater Kampala Metropolitan areas?
3) What are the practices and behaviours associated with WASH for health practitioners in HCFs in greater Kampala Metropolitan areas?
4) What are the existing management systems for WASH sustainability in HCFs (policies, guidelines, budgets/budget gaps, HR/responsibilities, structures, plans) in greater Kampala Metropolitan areas?

3.1.3. Justification

The focus of the research was government and Private not for profit (PNFP) HCFs because they offer services to majority of the poor and vulnerable mothers during deliveries. Research and interventions on WASH in health facilities is in line with the recommendations of the Joint monitoring Program (JMP) to have universal basic coverage of WASH in HCFs by 2030 (WHO/UNICEF, 2014). The proposed study addresses the targets of Sustainable Development Goal 6 especially the target on achieving universal access to basic drinking water, sanitation and hygiene for HCFs, schools and households, by 2030. In addition, the proposed study shall provide useful evidence for different stakeholders to address HCF WASH challenges in Uganda. The results shall be shared with the Ministry of Health, the Ministry of Water and Environment as well as Non-government organizations working in the WASH sector.

3.1.4. Conceptual framework

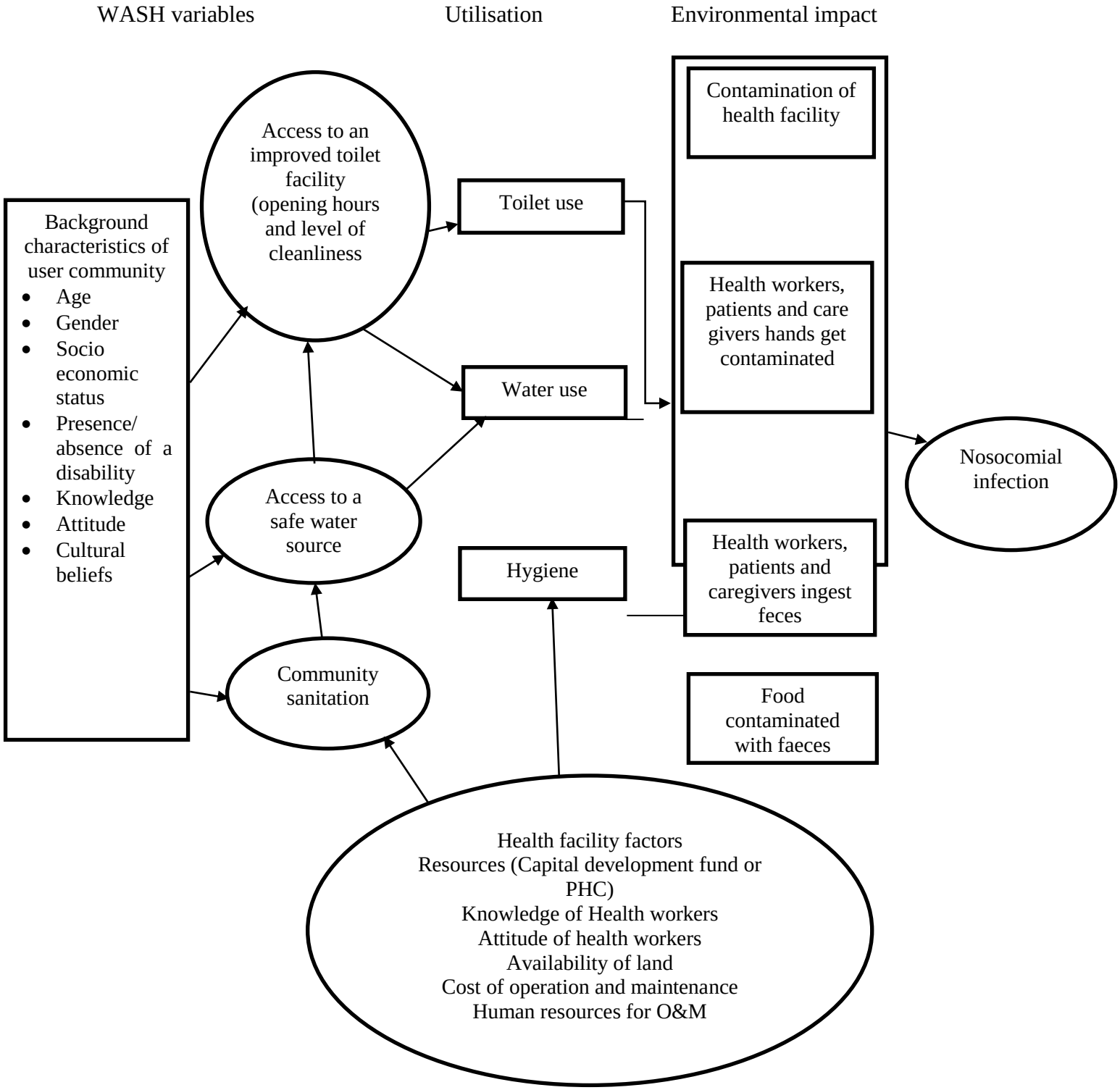


Figure 1: CONCEPTUAL FRAMEWORK (Modified from a conceptual framework by Dearden et al. (2017)

3.1.5. Narrative

The WASH status in health facilities is affected by a multitude of factors; some of these are related to the background characteristics of the users (these could be patients, caretakers and health workers) while others are associated with management practices. Background characteristics of the users such as age, gender, socio economic status, presence/ absence of a disability, their level of knowledge, and attitude as well as cultural beliefs have a direct implication on the utilization and ultimately the status of WASH status in the health facilities. Conversely, health facility determinants such as availability of human and natural resources such as cleaners and land for expansion, knowledge of health workers and the cost of operation and maintenance affect the WASH status of the health facilities. Failure to address the issues that are directly linked with the background characteristics of the users and the health facility determinants compromises access to WASH facilities, and consequently their utilization. Failure to utilize these facilities implies increased exposure to disease causing pathogens through touching health facility surfaces such as walls, ingestion of water and food as well as during the care for the sick. The ultimate outcome of these exposures is nosocomial infections.

CHAPTER FOUR

4.1. Study objectives

4.1.1. Main objective of the study

This study assessed the WASH status, associated factors and management systems for WASH sustainability in HCFs in greater Kampala Metropolitan areas so as to inform appropriate models for sustainability and improvements.

4.1.2. Specific objectives

1) To establish the status of WASH (water supply and quality, sanitation, hygiene, waste management and cleaning routines) in HCFs.
2) To understand WASH practices and behaviours for health practitioners in HCFs
3) To determine the factors associated with status of WASH status of HCF in the GKMA
4) To assess management systems for WASH sustainability in HCFs (policies, guidelines, budgets/budget gaps, HR/responsibilities, structures, plans).

CHAPTER FIVE

5.1. Methodology

5.1.1. Description of study area

The study was conducted in the Greater Kampala Metropolitan Area (GKMA) which includes Kampala, Wakiso and Mukono districts, as was defined in the operational definitions. The 3 districts of the GKMA are associated with increasing population as well as economic development (UBOS, 2014)The number of Government and PNFP HCFs that offer delivery services in the 3 districts of the GKMA is as provided in Table 1.

Table 1: Number of HCFs in Kampala, Wakiso and Mukono districts (Source: Ministry of Health (2018)).

	Hospitals		HC IVs		HC IIIs		Total
District	Government	NGO	Government	NGO	Government	NGO	
Kampala	5	9	4	3	8	12	41
Mukono	0	1	2	1	13	1	18
Wakiso	1	3	5	0	21	16	46
TOTAL	6	13	11	4	42	29	105

Kampala is the capital city of Uganda and has 5 administrative divisions including: Central, Rubaga, Makindye, Kawempe and Nakawa. The city has several HCFs across the 5 divisions and Mulago hospital (the National referral hospital) is located in Kawempe division. Mukono and Wakiso districts are neighbours to Kampala district, and the number of HCFs (Public and PNFP) in these districts is as indicated in Table 4.1 above.

5.1.2. Study design

A cross sectional study utilizing both qualitative and quantitative data collection research methods in selected HCFs that offer delivery services to the majority of the poor and vulnerable women in Kampala, Wakiso and Mukono districts was used.

5.1.3. Study units

The study units included HCFs (Hospitals, Health centre IVs and IIIs) in Kampala, Wakiso and Mukono districts.

5.1.4. Sampling procedure

Sixty percent of the HCFs (63 HCFs) at the 3 levels of hospital, HC IV and HC III were studied. Studying 57% of all the HCFs in the GKMA is representative enough according to the criteria described by Ramsey and Hewitt (2005).The sampling included all the hospitals and HC IVs due to their handling of majority of maternity and neonatal issues and sample about half of the HC III focusing largely on government and private not for profit hospitals. See Table 2.

Table 2: Sampling procedure for the HCFs

District	Hospitals		HC IVs		HC IIIs		Total
	Government	NGO	Government	NGO	Government	NGO	
Kampala	3	5	3	1	5	7	24
Mukono	0	1	1	1	7	1	11
Wakiso	1	2	3	0	13	9	28
Total	4	8	7	2	25	17	63

5.1.5. Sample size and sampling procedure of mothers for exit interviews

A sample of 300 mothers were interviewed in the 63 HCFs in the GKMA. The sample size for this study was calculated using the Leslie Kish formula with a P of 23% based on coverage of basic sanitation services in health care facilities in sub-Saharan Africa (UNICEF, 2019). Details of the sample size calculation are as indicated below:

$$n = \frac{Z^2 PQ}{\delta^2}$$ Where

n– Sample size

Z^2 - The standard normal deviate at 95% confidence (1.96)

P - Estimated prevalence of maternal sepsis was 23%

Q - 100% - P (or 1-P)

δ^2 - Maximum error estimated (5%)

Substituting into this formula translated to a minimum sample of 272 respondents. Considering an estimated non-response rate of 10%, brought the final sample size to 300 respondents. The maximum number of mothers to participate in the exit interviews in each of the HCFs was 5.

The mothers were selected randomly within the different HCFs. The KIs included the In-charges or administrators. Other KIs were recruited through a snow ball procedure based on their knowledge and experience of working on WASH in HCFs.

5.1.6. Methods matrix and detailed procedure

Table 3: Methods matrix and detailed procedure

Objective	Method	Sample size
Assessment of WASH status in HCFs	WASHCon tool on a Commcare mobile application with a focus on 5 domains: water supply, cleaning routines, hand-washing facilities, sanitation facilities and waste management.	❖ 63 HCFs (1 per HCF)
	❖ Water quality analysis: Membrane Filtration method using Chromocult Agar for testing. *Escherichia coli* (*E. Coli*). Samples were taken from 1 point of use in either maternal ward or Children's ward.	❖ 63 samples
	❖ Observations using an observation checklist	❖ Observations in delivery rooms; surgical rooms & resting rooms/neonatal nurseries of selected HCFs
	❖ Exit interviews with newly delivered mothers	❖ 300 mothers
Assessment of WASH practices and behaviours for both health practitioners and clients in HCFs	❖ Key informant interviews ❖ Observations of critical hand hygiene practices for health workers using the WHO guidelines	❖ 20 KIs interviews with cleaners ❖ Observation of 13 HCFs (1 per district per ownership status for hospitals (6) and HC IVs (6) and 1 HCF from HC III from government.
Assessment of factors associated with status of WASH in HCF	❖ Use of structured questionnaire	❖ 63 HCFs
Assessment of management systems for WASH sustainability in HCFs (policies, guidelines, budgets/budget gaps,	❖ Structured questionnaire with health facility in charges	❖ 63 HCFs

HR/responsibilities, structures, plans).		
Recommend appropriate models (management and service delivery) for WASH sustainability in HCFs	❖ Key informant interviews ❖ Documents review	❖ KIs interviews with cleaners

5.1.6.1. Assessment of WASH conditions in HCFs

A structured questionnaire and an observational checklist were used to assess the WASH status of the health care facilities. Information about the WASH status of the health care facilities was provided by the responsible departments and individuals. Information for the assessment of the WASH status was provided by the health facility In-charges; Heads of Engineering/Water supply Departments, Hospital Environmental Health Officers, cleaners as well as the operators of the water supply systems. These were selected due to their role in the management of WASH services at health facility level. An observational checklist was used to assess the WASH status in the delivery rooms, theatre and resting rooms in the selected HCFs. During this assessment, the variables in Table 4.4 below were studied.

5.1.6.2. Definitions of WASH status indicators

The JMP Service Ladders for Monitoring WASH in Healthcare Facilities were used to define the WASH status of health care facilities in the GKMA. These are further described in the table below;

Table 4: Definitions of WASH status indicators

SERVICE LEVEL	WATER	SANITATION	HAND HYGIENE	HEALTH CARE WASTE
Basic (SGD)	Water from an improved source is available on premises	Improved facilities are usable, separated for patients and staff, separated for women, provide menstrual hygiene facilities, and meet the needs of people with limited mobility	Hand hygiene materials, either a basin with water and soap or alcohol hand rub, are available at points of care and toilet	Waste is safely segregated into at least 3 bins in the consultation area, and sharps and infectious waste are safely treated and disposed of
Limited	Water from an improved source is available off premises; or an improved source is onsite, but no water is available	Improved sanitation facilities are present but are not usable or do not meet the needs of specific groups (staff, women, people with limited mobility)	Hand hygiene station at either point of care or toilets, but not both	Waste is segregated but not disposed of safely, or bins are in place but not used effectively

No Service	Unprotected dug well or spring, surface water, or no water source	Pit latrines without a slab or platform, hanging latrines, or no toilets or latrines at the facility	Hand hygiene stations are absent, or present but with no soap or water	Waste is not segregated or safely treated and disposed of

5.1.7. Measurement of WASH status indicators

Table 5: Measurement of WASH status indicators

Aspects	Variables	Measurement
Water supply	- Type of water supply - Reliability of water supply - Location/distance of water sources - Risks of pollution of water sources - Microbiological quality - Presence or absence of Total coliforms (TC), *Escherichia coli* (*E. Coli*)	- Safe/unsafe water supply - Compare to WHO recommended - Compare to WHO recommended - Risk level/score - CFU/100mls
Sanitation	- Type of sanitation facilities available - Location/distance - Presence of appropriate anal cleansing materials - Presence of hand washing facilities - Frequency of cleaning	- Improved/unimproved - Compare to WHO recommended - Present/absent - Present/absent - Compare to WHO recommended
Hand Hygiene	- Presence of hand washing facilities (functional sinks/tippy taps with soap) - Location of hand washing facilities - Evidence of use of facilities	- Compare to WHO recommended - Compare to WHO recommended - Observed
Solid waste management	- Solid waste collection - Segregation of solid waste	- Compare to WHO recommended - Compare to WHO recommended

	- Transport and treatment of solid waste	- Compare to WHO recommended
Cleaning	- Cleaning practice and routine - Frequency of cleaning - Types of available cleaning materials and reagents - Training for cleaners	- Compare to WHO recommended - Compare to WHO recommended - Compare to WHO recommended - Compare to WHO recommended

5.1.8. Data collection procedure for WASH assessment

Data collection was conducted using the WASH Conditions (WASHCon) tool on a Commcare mobile application comprised of interviews with key informants in the HCFs, observations and water quality analysis. The observations and interviews were conducted by trained enumerators using a mobile device and generally took less than 1 hour with one enumerator per HCF site to complete (depending on the size of the facility). Once the data was collected via a mobile device, the information was uploaded onto the WASHCon Commcare app, into a pre-programmed dashboard via a wireless internet network, with a server at MaKSPH. The app was updated, and forms synchronized daily by each enumerator. Printed observation checklists and interview guides were also be used in case of technical issues with the mobile devices. In such incidences, the filled in paper checklists/interview guides were later transferred onto a functional mobile device and then uploaded. The WASHCon tool is a validated tool that has been used in Rwanda, Ghana, Uganda, Cambodia, Zambia, Malawi, Honduras and other countries (Nyirenda and Ferrey, 2018). Other details about the WASHCon tool can be read on the links: http://washconhcf.org/research-tools/washcon/ and http://washconhcf.org/wp-content/uploads/2017/09/WASHCon-WASH-FIT_updated-8.4.pdf.

5.1.9. Water quality assessment

Apart from the self-reports given by the KIs in HCFs, the water supply conditions were explored further through water quality testing and observations of existing water sources and systems. Observations were done to assess the risks associated with pollution of the existing water sources and systems. Water quality testing was done to assess microbial contamination in the water based on the variables provided in Table 4.2 under water supply. Population based sample size formulae do not apply in environmental sampling and therefore sampling tables were used instead.

5.1.10. Water sample collection and analysis

At each facility, one water sample was collected from the Labour/Delivery room on the assumption that the risk of transmission of infections to mothers and neonates was greater than in other rooms. Often, the burden of infections in neonates is highest in the first 7 days (Oza et al.,

2014). A total of 63 water samples were collected, and all samples were collected using Whirl-Pak bags (with sodium thiosulfate to halt chlorine action in chlorinated supplies) and stored on ice until they were processed and analysed in laboratory. Each was processed for incubation within four hours from the time of collection. Water was tested for faecal coliform, i.e. *E. coli* using the membrane filter method. The samples on membrane filters were culture using Chromocult coliform arga by incubating them at 37°C for 24 hours. Colonies of *E-coli* (i.e. dark blue to violet in colour) were counted and results recorded per 100ml of sample.

5.1.11. Assessment of management systems for WASH sustainability in HCFs

A management survey comprising of questions related to budgets for WASH, adequate personnel for WASH infrastructure, policy guidelines, WASH/IPC committees and required training in WASH/IPC for staff was administered to the administrator or in-charge of each HCF. The survey tool that was used is provided in appendix 4.

5.1.12. Technical Support for HCF Improvement Plans

The Emory-MAKSPH team developed the tools and strategies that have been adopted to support implementation of the results of this assessment. These tools were used in other countries including Uganda. The tools and strategies are

1. Sustainability Assessment Tool: This tool can be used to delve deeper into the technical feasibility, on-site capacity, financial and operational accountability and institutional engagement of WASH systems at each HCF.
2. WASH in HCF Policy Maker's strategy: This is a step by step strategy on how to engage policy makers and advocate for change for WASH in HCF
3. Training of HCF staff in WASH/ IPC: This training module is geared towards HCF staff to support improvements in WASH/IPC in HCF

5.1.13. Data analysis

a) Quantitative data

Quantitative data was entered in ODK software using mobile phones and exported to SPSS version 23 and STATA version 14 for statistical analysis. Data was analysed using both descriptive and inferential statistics, mainly parametric tests. For WASHCon the data was analysed using STATA version 14.0 and a dashboard created with the summary WASHCon scores, JMP results and individual facility reports. A Chi-square test was used to assess association between predictors outcome variable.

b) Qualitative data

The latent content analysis (summative content analysis) method for data analysis (Graneheim and Lundman, 2004, Hsieh and Shannon, 2005), which has been noted to be an unobtrusive and nonreactive way to study the phenomenon of interest was used. Content analysis is a qualitative research method that has come into wide use in health studies in recent years (Hsieh and Shannon, 2005). The method has been described by many researchers as flexible for analysing text data (Cavanagh, 1997). Qualitative data from all the KIs were transcribed in English. Through listening to recorded materials meanings, explanations and relationships between concepts were established. Transcripts and notes were read several times and later meaningful units were coded, reduced and categorized into themes.

5.1.14. Ethical considerations

Informed consent process

Ethical approval was obtained from Makerere University School of Public Health Higher Degrees and Ethics Committee. Administrative clearance was also obtained from KCCA, Wakiso and Mukono district local government as well as management of participating health care facilities. All informed consent discussions were done in the appropriate language (usually English, Luganda) with a translator where necessary. Information sheets and consent forms were made available in English or Luganda with details on: the purpose of the project, procedures to be followed as well as the risks and benefits of participation.

During the consent discussions, each section of the consent form was read exactly as it is written either by the study personnel or translator, and then further explained to the participant if necessary. All participants were informed that participation in the study was completely voluntary and that they could withdraw from the study at any time. Written consent to participate in the study was documented on the appropriate form for the community survey and in-depth interviews. If a person asked to provide consent is unable to read or write, their thumb print was used instead of the signature and a signature from a witness to the consent procedure were obtained.

Risks and discomforts

Only water samples were collected from the maternity unit. The risk associated with sample collection and data management was minimal.

Confidentiality

To ensure confidentiality during data collection: data collection tools were designed to ensure utmost confidentiality through use of unique codes (identification numbers) instead of names; all information gathered were treated as private by the study personnel; records were kept secure in locked filling cabinets and offices.

CHAPTER SIX

6.1. RESULTS

6.1.1. Health facility characteristics

The survey included a total of 63 health care facilities. Among these, 33% (21/63) were selected from Kampala district; about 69.8% (44/63) were at the level of health centre III and 60.3% (38/63) were owned by government. These findings are summarised in the table below;

Table 6: Health facility characteristics

Variable	Attribute	Frequency (N=63)	Percentage (%)
District	Kampala	21	33.3
	Mukono	12	19.0
	Wakiso	30	47.6
Level of health facility	Health centre III	44	69.8
	Health Centre IV	9	14.3
	Hospital	10	15.9
Ownership	Public	38	60.3
	PNFP	25	39.7

6.1.2. Socio-demographic characteristics of the respondents (exit interviews)

A total of 300 exit interviews were conducted among mothers seeking health care services from selected health care facilities in Wakiso, Kampala and Mukono districts. More than half (51%) (153/300) of these were interviewed at health care facilities in Kampala; 73% (219/300) were in urban health facilities; and 47% (141/300) were interviewed from hospitals. More than half (56.3%) (169/300) were accessing health care in public facilities. Over 35.3% (106) were at the Out-Patient Department (OPD). The mean age of the respondents was 27.4 (SD±5.3). Majority of the respondents (51%) (153/300) were between the age of 25-32. At least 33.7/300 (101/300) had attained at least secondary ordinary level of education. Over 87.3% (262/300) had spent

between 1-60 hours at the health facility at the time of interview. These results are further shown in the table below;

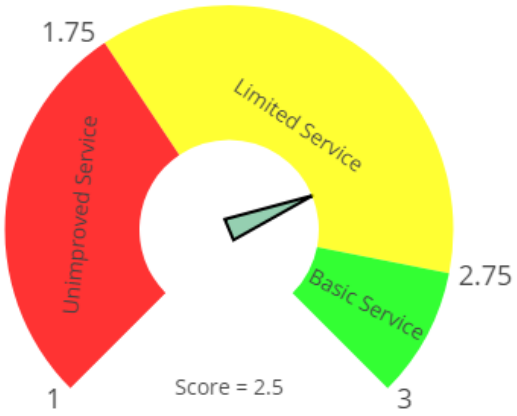
6.1.3. Socio-demographic characteristics of the respondents

Variable	Attribute	Frequency (n=300)	Percentage (%)
District where interview was conducted	Kampala	153	51.0
	Wakiso	101	33.7
	Mukono	46	15.3
Location of health facility where interview was conducted	Urban	219	73.0
	Rural	81	27.0
Level of health facility	Hospital	141	47.0
	HC IV	41	13.7
	HC III	118	39.3
Type of ownership	Public	169	56.3
	Private Not for Profit	131	43.7
Location of respondent recruitment	Out Patient Department	106	35.3
	Inpatient Department	45	15.0
	Delivery/Maternity area	149	49.7
Age of the respondent (Mean age=27.4±5.3)	18-24 Years	98	32.7
	25-32 Years	153	51.0
	Above 33 Years	49	16.3
Highest level of education	No formal education	9	3.0
	Some primary education	38	12.7
	Completed primary education	55	18.3
	Secondary O- level	101	33.7
	Secondary A-level	42	14.0
	Post-secondary level	25	8.3
	University	30	10.0
Duration of stay (in hours) at the health care facility (Mean=23±5.0)	0-60 Hours	262	87.3
	61 to 120 Hours	32	10.7
	More than 121 Hours	6	2.0

6.1.4. Assessment of the WASH status of health care facilities

6.1.4.1. Average scores by domain for the healthcare facilities selected WASHCon domains

The gauge shows the average total score of all four domains for the healthcare facilities selected.

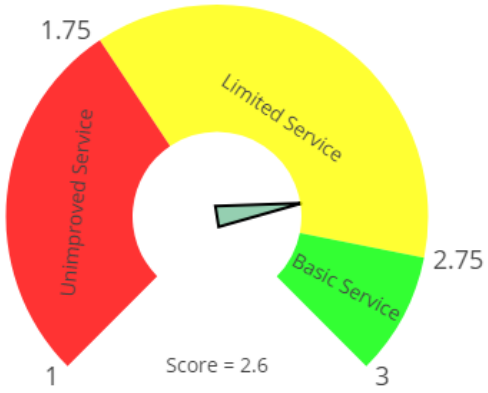


The table provides the average, minimum and maximum scores for each of the WASHCon domains for the healthcare facilities selected.

Domain	mean	min	max
Water Supply	2.6	1.6	3
Sanitation Facilities	2.1	1.3	3
Environmental Cleanliness	2.5	1.5	3
Hand Hygiene	2.4	1	3
Waste Management	2.6	1.5	3
Overall	2.5	1.5	3

Water Supply

The gauge shows the average score of the Water Supply domain for the healthcare facilities selected.

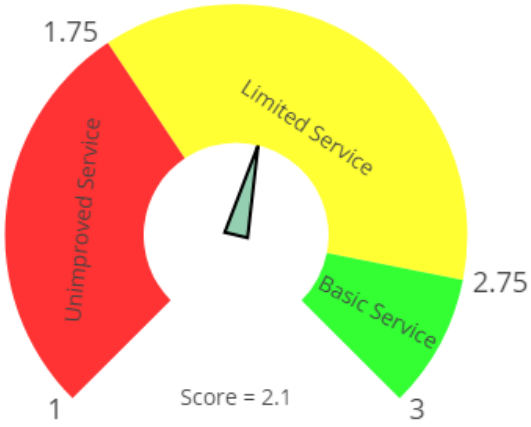


The table provides the average, minimum and maximum scores for each of the Water Supply domain for the healthcare facilities selected.

Subdomain	mean	min	max
Source and Access	2.6	1	3
Quantity	2.4	1	3
Quality	2.9	1	3

Sanitation

The gauge shows the average score of the Sanitation domain for the healthcare facilities selected.

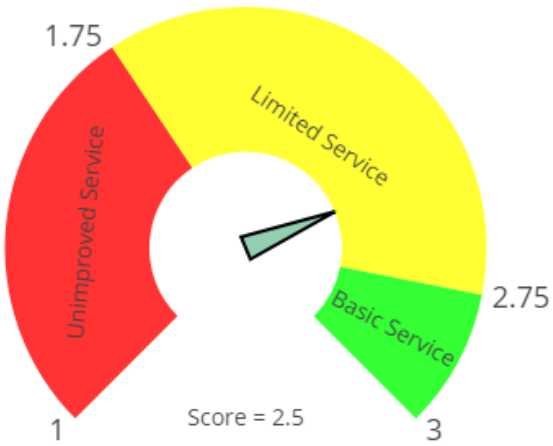


The table provides the average, minimum and maximum scores for each of the Sanitation domain for the healthcare facilities selected.

Subdomain	mean	min	max
Accessibility	2.1	1.2	3
Quantity	1.5	1	2
Infrastructure	2.7	1	3

Environmental Cleanliness

The gauge shows the average score of the Environmental Cleanliness domain for the healthcare facilities selected.

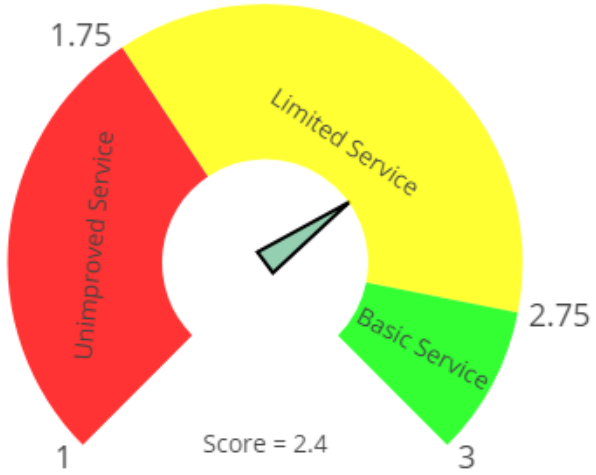


The table provides the average, minimum and maximum scores for each of the Environmental Cleanliness domain for the healthcare facilities selected.

Subdomain	mean	min	max
Equipment and supplies	2.2	1	3
Facility hygiene	2.7	1.8	3

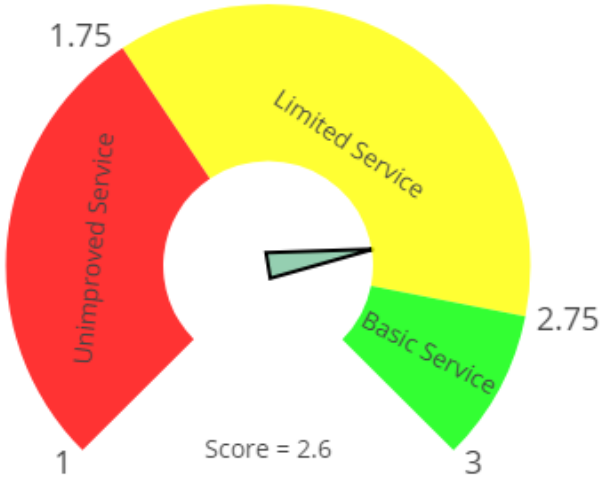
Hand Hygiene

The gauge shows the average score of the Hand Hygiene domain for the healthcare facilities selected.



Waste Management

The gauge shows the average score of the Waste Management domain for the healthcare facilities selected.



The table provides the average, minimum and maximum scores for each of the Waste Management domain for the healthcare facilities selected.

Subdomain	mean	min	max
Segregation	2.6	1	3
Treatment and disposal	2.6	2	3

Facility specific reports are can be downloaded on:

https://ywan446.shinyapps.io/Uganda_WaterAid/

6.1.5. Water supply in health care facilities

6.1.5.1. Main source of water

The study revealed that 78% of the health care facilities depend on piped supply from outside the facility while about 17% depend on rain water as the main source of water supply as summarized in the figure below:

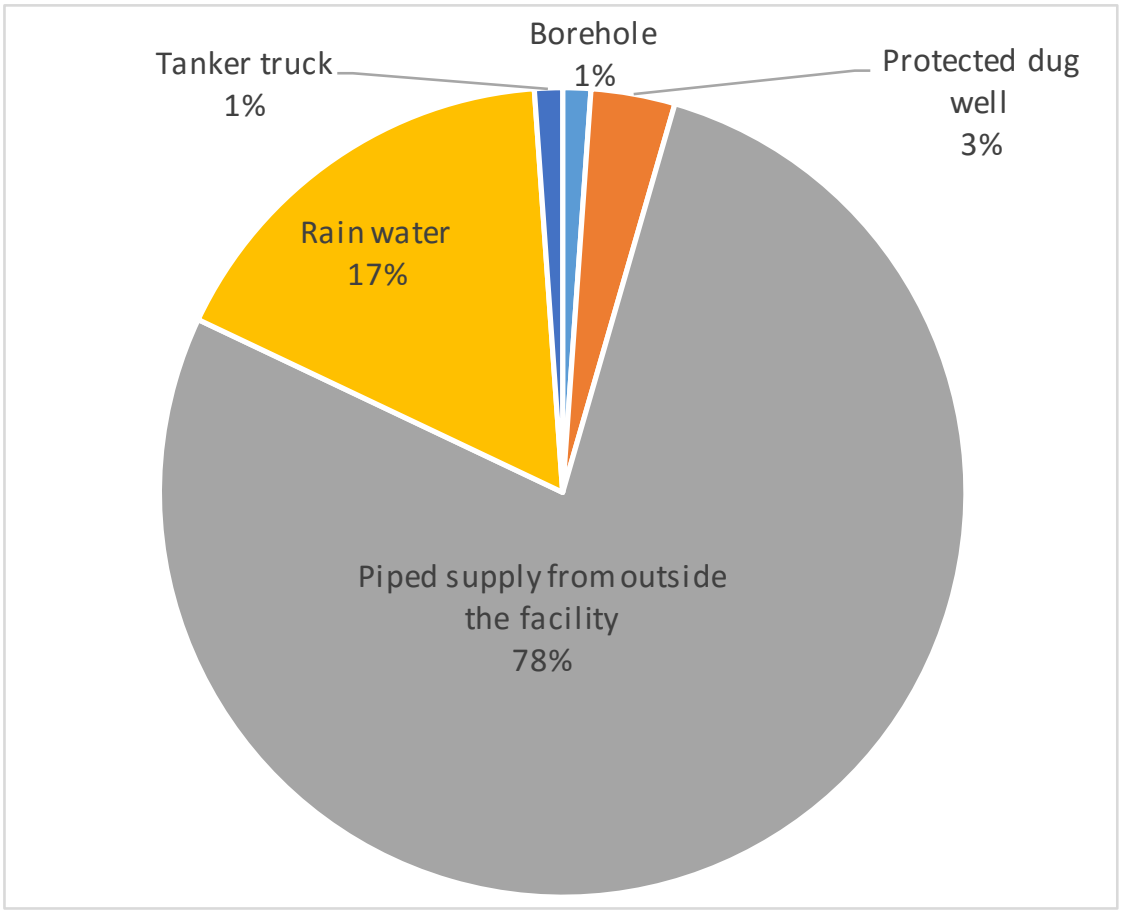
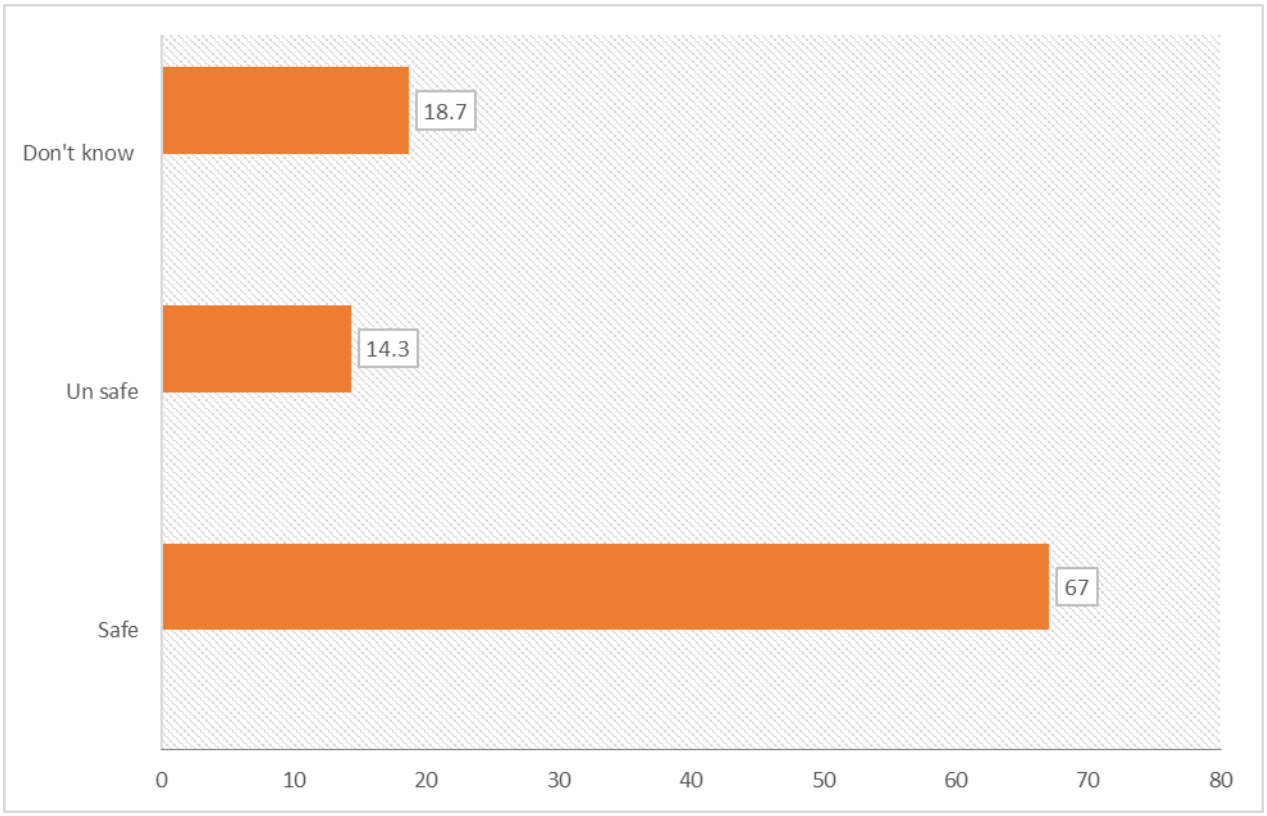


Figure 2: Main source of water at the health facility

6.1.5.2. User perception on quality of drinking water at the health facility

When respondents were asked about the quality of water at the health facility, almost a quarter (14.3%) (43/300) mentioned that it was unsafe. The reason given for the water being unsafe was that all the participants did not think the water was t



eated.

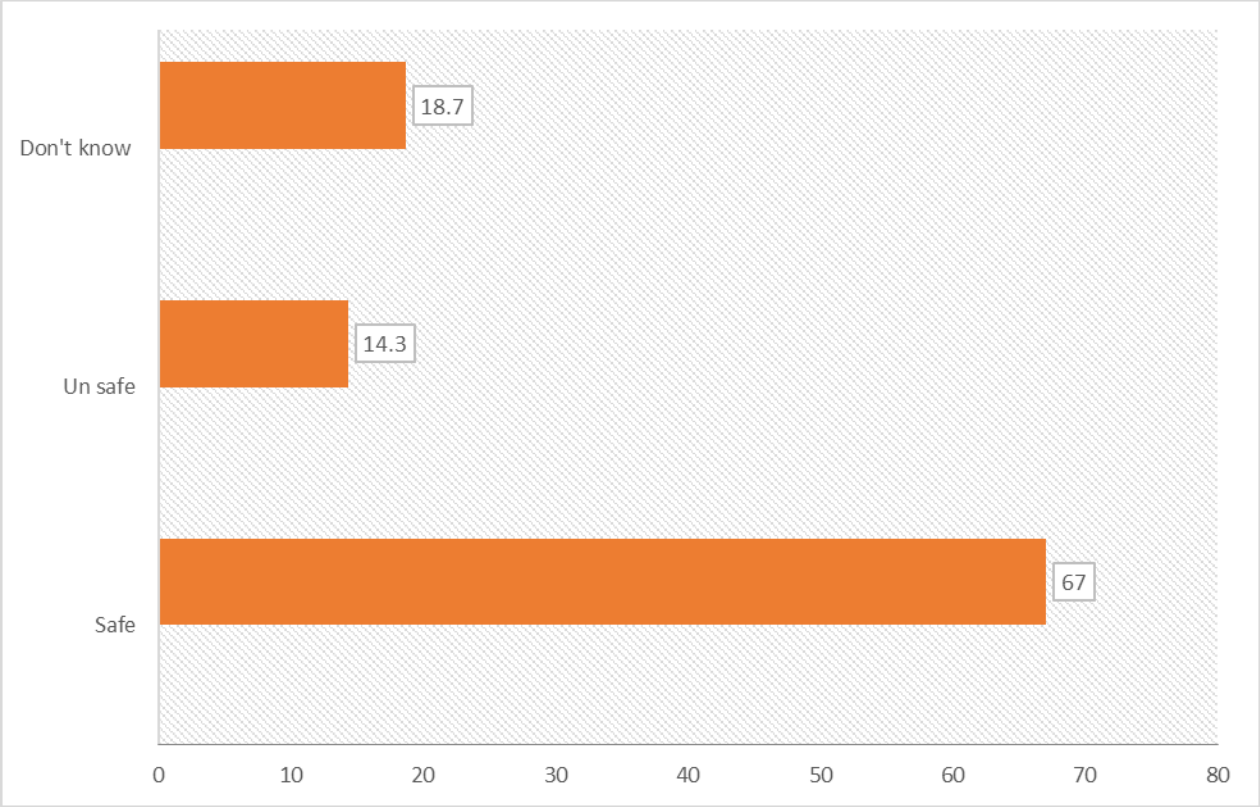


Figure 3: Perception of water quality

6.1.6. Satisfaction with sanitation facilities

About 72% (216/300) agreed that they had used a toilet facility. Regarding those that had not used a sanitary facility, majority (80/84) (96.4%) mentioned that they did not have the need to use the toilet facilities. More than half (54%) (162/300) felt the number of drop holes in the toilets at the health facilities were enough while about 68.7% (206/300) pointed out that they were satisfied with the availability of water in the toilets. Regarding suitability of the toilet facilities, about 58% (174/300) mentioned that the toilet facilities were not suitable for children below the age of five years while 63% (191/300) mentioned that the toilet facilities are not suitable for disabled persons. These findings are further presented in the table below;

Table 7: Satisfaction with toilet facilities in Healthcare Facilities

Variable	Attribute	Frequency (n=300)	Percentage (%)
Used a toilet while at the health facility	Yes	216	72.0
	No	84	28.0
Reasons for not accessing a toilet facility (n=84)	Did not have a need	80	96.4
	No water in the toilet	1	1.2
	Toilet is dirty	2	2.4
Opinion about the number of drop holes in the toilet facilities	Very few	12	4.0
	Few	94	31.3
	Enough	162	54.0
	More than enough	11	3.7
	No opinion	21	7.0
Satisfaction with availability of water in toilet facilities	Yes	206	68.7
	No	94	31.3
Suitability of toilets			
Suitable for under five children	Yes	126	42.0
	No	174	58.0
Suitable for use by pregnant women	Yes	216	72.0
	No	84	28.0
Suitable for use by disabled persons	Yes	109	36.3
	No	191	63.7

6.1.7. Intention to wash hands and frequency of HW by heath care providers

More than a quarter (15.3%) (46/300) of the respondents mentioned that they had at one time attempted to wash hands but failed. About 58.7% (27/46) mentioned that they failed to wash hands due to inadequate water while 34.8% (16/46) mentioned that they lacked soap. When respondents were also asked how often the health workers examining them had washed hands, about 36% (108/300) mentioned that they never washed hands while 33% (99/300) mentioned that the health workers always washed their hands during the medical examination process. These findings are further summarized in the table below;

Table 8: Intention to wash hands while at the health facility and frequency of hand washing by heath care providers

Variable	Attribute (n=300	Frequency (n=300)	Percentage (%)
Wished to wash hands but failed	No	254	84.7
	Yes	46	15.3
Reasons for failing to wash hands (n=46) **			
Inadequate/lack of water	Yes	27	58.7
	No	19	41.3
Inadequate/ lack of soap	Yes	16	34.8
	No	30	65.2
I was in a hurry	Yes	2	4.3
	No	44	95.7
Frequency of handwashing by health care provider during medical examination (n=300)	Always	99	33.0
	Sometimes	60	20.0
	Never	108	36.0
	Don't know	33	11.0

Multiple response**

6.1.8. Knowledge on critical handwashing times

When mothers were asked about the critical handwashing times, over 90.3% (271/300) mentioned washing hands after visiting the toilet, 73% (219/300) mentioned before and after eating a meal whereas 36% (108/300) mentioned after cleaning a child's bottom. The results are shown in the graph below;

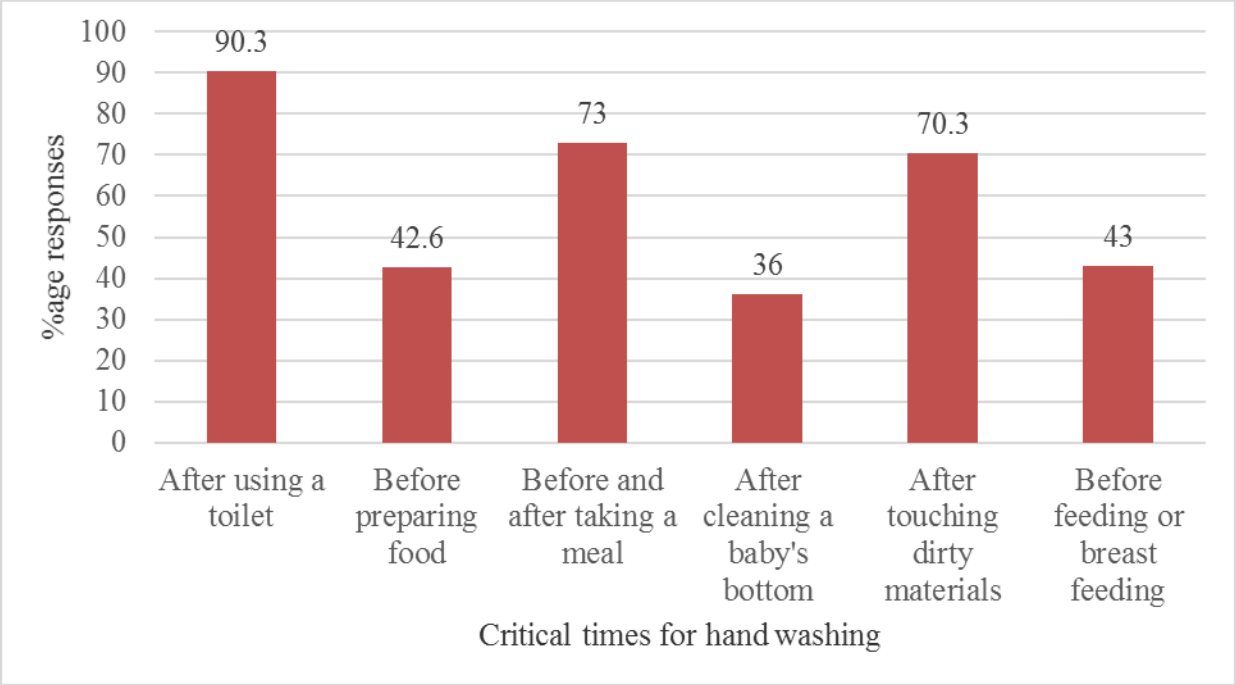


Figure 5: Critical handwashing times

6.1.9. Access to information on WASH

Respondents were asked if they had heard of any information on Water, Sanitation and Hygiene (WASH) while at the health facility. Just 52.7% (158/300) mentioned that they had heard some information on WASH. Regarding the source of information on WASH; about 153/158 (96.8%) mentioned health workers; only 3.8% (6/158) mentioned a village health team member; 22.8% (36/158) mentioned posters while 8.9% (14/158) mentioned a television. These results are shown in the table below;

Table 9: Sources of information on WASH

Variable	Attribute	Frequency (n=300)	Percentage (%)
Heard some information on WASH	Yes	158	52.7
	No	142	47.3
Source of information on WASH (n=158) **			
Health worker	Yes	153	96.8
	No	5	3.2
Village Health Team member	Yes	6	3.8
	No	152	96.2
Posters	Yes	36	22.8
	No	122	77.2
Television	Yes	14	8.9
	No	144	91.1

Multiple response**

6.1.10. Thematic area relating to information on WASH

Respondents were asked about the kind of information they had received while at the health facility. About 36.4% (64/176) ** mentioned handwashing while 23.3% (41/176) ** mentioned baby hygiene. These findings are shown in the figure below;

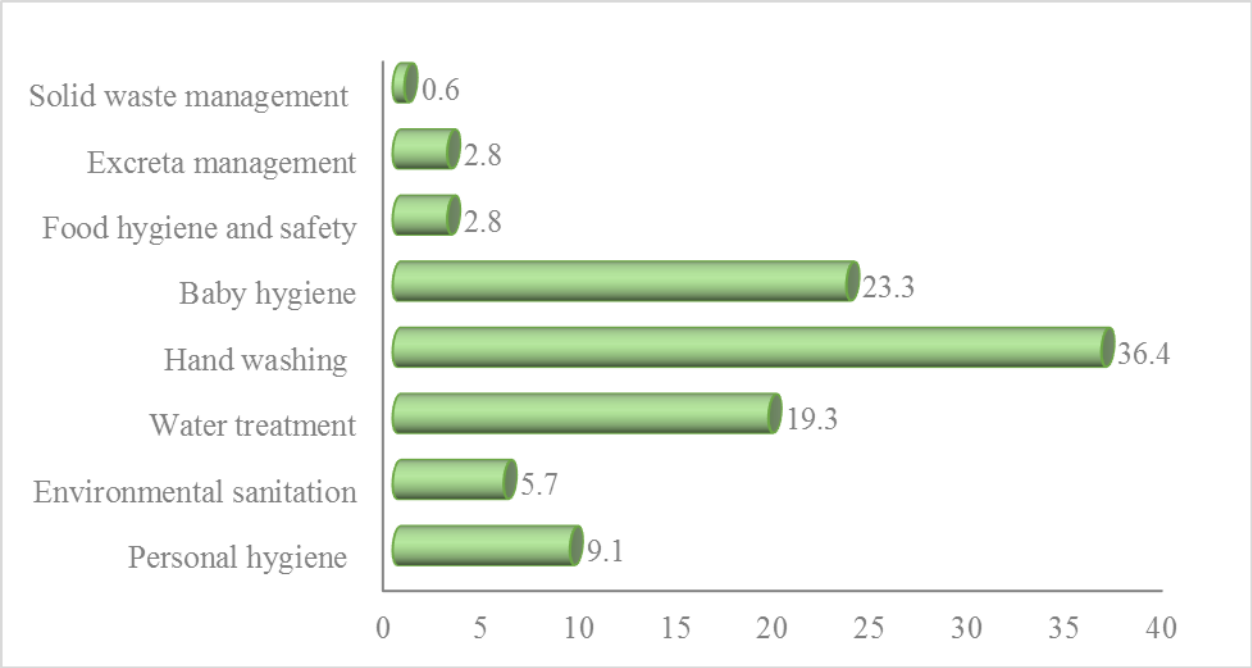


Figure 4: WASH related information received by Mothers while at the Health facility

6.1.11. Water, sanitation and hygiene status of health care facilities

The JMP scoring system was used to assess the status of water, sanitation and hygiene in health care facilities. Results indicated that 48.1% (26/54) of the health care facilities had a limited water service; about 85.2% (46/54) had a limited sanitation service; 51.9% (28/54) had limited environmental cleanliness; 57.4% (31/54) had a limited hand hygiene service whereas 53.7% (29/54) had a limited waste management service. These results are further summarised in the table below;

Table 10: Water, sanitation and hygiene status of health care facilities

Variable	Attribute	Frequency (N=54)	Percentage (%)
Water supply	Basic	25	46.3
	Limited	26	48.1
	Unimproved	3	5.6
Sanitation	Basic	1	1.8
	Limited	46	85.2
	Unimproved	7	13.0
Hand hygiene	Basic	19	35.2
	Limited	31	57.4
	Unimproved	4	7.4
Waste management	Basic	24	44.4
	Limited	29	53.7
	Unimproved	1	1.9
Environmental cleanliness	Basic	21	38.9
	Limited	28	51.9
	Unimproved	5	9.3

6.1.12. Factors associated with the water service status in health care facilities

There was a statistically significant association between water service status and; the level of health care facility (χ^2 (4) =15.103, p=0.004); ownership (χ^2 (2) =6.00, p=0.050); regular staff appraisal on performance (χ^2 (2) =6.361, p=0.042); frequent communication between the in charge and maintenance staff about WASH issues (χ2 (2)=09.828, p=0.007); undertaking regular audits in wards to establish availability of hand sanitizer and soap (χ^2 (2) =6.843, p=0.033) and presence of a clearly visible and legible up-to-date diagram of the facility management structure (χ^2 (2) =8.864, p=0.012). These results are further shown in the table below;

Table 11: Factors associated with the water service status in health care facilities

Variable	Attribute	Water supply			χ^2	P-value
		Basic (N=25) (%)	Limited (N=26) (%)	Unimproved (N=3) (%)		
Level of health facility	Health Centre III	12 (48)	20 (76.9)	3 (100)	15.103	0.004*
	Health Centre IV	3 (12)	6 (23.1)	0 (0)		
	Hospital	10 (40)	0 (0)	0 (0)		
Ownership	Public	13 (52)	21 (80.8)	1 (33.3)	6.000	0.050*
	PNFP	12 (48)	5 (19.2)	2 (66.7)		
	Health facility managers' attitudes towards WASH services					
Overseeing the maintenance of WASH infrastructure, including preventative maintenance and repairs, is my responsibility.	Yes	21 (840	22 (84.6)	2 (66.7)	0.639	0.727
	No	4 (16)	4 (15.4)	1 (33.3)		
It is my responsibility to ensure that staff at the hospital are educated about IPC and WASH.	Yes	22 (88)	23 (88.5)	2 (66.7)	1.171	0.557
	No	3 (12)	3 (11.5)	1 (33.3)		
Spending time learning about WASH is a good use of my time as a director/manager.	Yes	23 (92)	26 (100)	3 (100)	2.409	0.300
	No	2 (8)	0 (0)	0 (0)		

I am ultimately responsible for the sustainability of the WASH infrastructure, conditions, and behaviours at this facility.	Yes	21 (84)	24 (92.3)	2 (66.7)	1.948	0.738
	No	4 (16)	2 (7.7)	1 (33.3)		
Making sure that there is sufficient funding for the supplies associated with WASH is my responsibility.	Yes	18 (72)	18 (69.2)	2 (66.7)	0.068	0.967
	No	7 (28)	8 (30.8)	1 (33.3)		
	WASH management systems					
Staff regularly appraised on their performance	Yes	25 (100)	21 (80.8)	2 (66.7)	6.361	0.042*
	No	0 (0)	5 (19.2)	1 (33.3)		
Availability of cleaning protocols	Yes	14 (56)	8 (30.8)	0 (0)	5.544	0.063
	No	11 (44)	18 (69.2)	3 (100)		
In charge/ director communicates with the maintenance staff frequently enough to be aware of important WASH issues at the facility	Yes	24 (96)	18 (69.2)	1 (33.3)	9.828	0.007*
	No	1 (4)	8 (30.8)	2 (66.7)		
Health care facility has written policies and protocols relating to cleaning the delivery room	Yes	12 (48)	10 (38.5)	0 (0)		0.264
	No	13 (52)	16 (61.5)	3 (100)		
Regular audits undertaken in each ward to assess the availability of hand sanitizer, soap, single use towels and other hand hygiene resources	Yes	22 (88)	16 (61.5)	1 (33.3)	6.843	0.033*
	No	3 (12)	10 (38.5)	2 (66.7)		
Have an annual planned budget for the healthcare facility that includes funding for WASH infrastructure (sinks, toilets, etc.), services (pit emptying) and personnel	Yes	17 (68)	18 (69.2)	2 (66.7)	0.014	0.993
	No	8 (32)	8(30.8)	1 (33)		
Healthcare facility has a dedicated infection control focal person or committee	Yes	18 (72)	14 (53.8)	3 (100)	3.566	0.168
	No	7 (28)	12 (46.2)	0 (0)		

Presence of a clearly visible and legible up-to-date diagram of the facility management structure	Yes	17 (68)	7 (26.9)	1 (33.3)	8.864	0.012*
	No	8 (32)	19 (73.1)	2 (66.7)		
Main source of funds for WASH activities	Facility generated revenue	11 (44)	3 (11.5)	2 (66.7)	11.430	0.076
	Government	13 (52)	21 (80.8)	1 (33.3)		
	No budget for WASH	1 (4)	0 (0)	0 (0)		
	Non-profit	0 (0)	2 (7.7)	0 (0)		
healthcare personnel receive infection prevention and control (IPC) training as part of their orientation program	Yes	20 (80)	15 (57.7)	1 (33.3)	4.442	0.108
	No	5 (20)	11 (42.3)	2 (66.7)		
High performing staff recognized and rewarded, while staff that do not perform well dealt with accordingly	Yes	16 (64)	8 (30.8)	1 (33.3)	5.875	0.053
	No	9 (36)	18 (69.2)	2 (66.7)		
HCF has adequate cleaners and maintenance staff	Yes	16 (64)	18 (69.2)	1 (33.3)	1.533	0.465
	No	9 (36)	8 (30.8)	2 (66.7)		
HCF has written guidelines pertaining to water, sanitation, and hygiene	Yes	11 (44)	12 (46.2)	1 (33.3)	0.183	0.913
	No	14 (56)	14 (53.8)	2 (66.7)		

*Statistically significant

6.1.13. Factors associated with the sanitation status in health care facilities

There was no statistically significantly association between sanitation status and level of health care facility, ownership of health care facility, and management system variables under study. These findings are further indicated in the table below;

Table 12: Factors associated with the sanitation status in health care facilities

Variable	Attribute	Sanitation status				P-value
		Basic (N=1) (%)	Limited (N=46) (%)	Unimproved (N=7) (%)	χ^2	
Level of health facility	Health Centre III	1 (100)	29 (63)	5 (71.4)	3.084	0.588
	Health Centre IV	0 (0)	7 (15.2)	2 (28.6)		
	Hospital	0 (0)	10 (21.8)	0 (0)		
Ownership	Public	0 (0)	29 (63)	6 (85.7)	0.245	0.197
	PNFP	1 (100)	17 (37)	1 (14.3)		
	Attitudes towards WASH in HCF					
Making sure that there is sufficient funding for the supplies associated with WASH is my responsibility	True	1 (100)	31 (67.4)	6 (85.7)	1.407	0.495
	False	0 (0)	15 (32.6)	1 (14.2)		
I am ultimately responsible for the sustainability of the WASH infrastructure, conditions, and behaviours at this facility.	True	1 (100)	39 (84.8)	7 (100)	1.399	0.497
	False	0 (0)	7 (15.2)	0 (0)		
Spending time learning about WASH is a good use of my time as a director/manager.	True	1 (100)	45 (97.8)	6 (85.7)	2.538	0.281
	False	0 (0)	1 (2.2)	1 (14.3)		
It is my responsibility to ensure that staff at the hospital are educated about IPC and WASH.	True	1 (100)	39 (84.8)	7 (100)	1.399	0.497
	False	0 (0)	7 (15.2)	0 (0)		
Overseeing the maintenance of WASH infrastructure, including preventative maintenance and repairs, is my responsibility.	True	1 (100)	38 (82.6)	6 (85.7)	0.246	0.884
	False	0 (0)	8 (17.4)	1 (14.3)		
	Management systems					

Staff regularly appraised on their performance	Yes	1 (100)	40 (87)	7 (100)	0.246	0.556
	NO	0 (0)	6 (13)	0 (0)		
Availability of cleaning protocols	Yes	0 (0)	21 (45.7)	1 (14.3)	3.176	0.204
	No	1 (100)	25 (54.3)	6 (85.7)		
In charge/ director communicates with the maintenance staff frequently enough to be aware of important WASH issues at the facility	Yes	1 (100)	37 (80.4)	5 (71.4)	0.564	0.754
	No	0 (0)	9 (19.6)	2 (28.6)		
Health care facility has written policies and protocols relating to cleaning the delivery room	Yes	0 (0)	20 (43.5)	2 (26.8)	0.153	0.533
	No	1 (100)	26 (56.5)	5 (71.4)		
Regular audits undertaken in each ward to assess the availability of hand sanitizer, soap, single use towels and other hand hygiene resource	Yes	1 (100)	34 (73.9)	4 (57.1)	1.244	0.537
	No	0 (0)	12 (26.1)	3 (42.9)		
Have an annual planned budget for the healthcare facility that includes funding for WASH infrastructure (sinks, toilets, etc.), services (pit emptying) and personnel	Yes	0 (0)	33 (71.7)	4 (57.1)	2.818	0.244
	No	1 (100)	13 (28.3)	3 (42.9)		
Healthcare facility has a dedicated infection control focal person or committee	Yes	0 (0)	31 (67.4)	4 (57.1)	2.157	0.340
	No	1 (100)	15 (32.6)	3 (42.9)		
Presence of a clearly visible and legible up-to-date diagram of the facility management structure	Yes	1 (100)	22 (47.8)	2 (28.6)	2.088	0.352
	No	0 (0)	24 (52.2)	5 (71.4)		
Contracted someone to complete tasks related to the maintenance and repair of your water source and/or distribution system	Yes	0 (0)	26 (56.5)	2 (28.6)	2.998	0.233
	No	1 (100)	20 (43.5)	71.4%		
Daily availability and function of water, sanitation and hygiene infrastructure (sinks, toilets, etc.) is shared across more than one staffs	Yes	1 (100)	31 (67.4)	4 (57.1)	0.797	0.671
	No	0 (0)	15 (32.6)	3 (42.9)		

*Statistically significant

6.1.14. Factors associated with hygiene status in health care facilities

There was a statistically significant association between hygiene status and staff including having a clear and legible job description ($\chi 2$ (2) = 6.163, p=0.046). No statistically significant association was found between hygiene status and level of health facility, ownership, communication between the in charge and maintenance staff, and new cleaners receiving IPC training. These findings are further elaborated in the table below;

Table 13: Factors associated with hygiene status in health care facilities

Variable	**Attribute**	**Hand hygiene status**				**P-value**
		Basic (N=19) (%)	Limited (N=31) (%)	Unimproved (N=4) (%)	χ^2	
Level of health facility	Health Centre III	12 (63.2)	19 (61.3)	4 (100)	6.767	0.109
	Health Centre IV	1 (5.3)	8 (25.8)	0 (0)		
	Hospital	6 (31.6)	4 (12.9)	0 (0)		
Ownership of health care facility	Public	9 (47.4)	23 (74.2)	3 (75)	1.933	0.141
	PNFP	10 (52.6)	8 (25.8)	1 (25)		
In charge/ director communicates with the maintenance staff frequently enough to be aware of important WASH issues at the facility	Yes	17 (89.5)	23 (74.2)	3 (75)	1.753	0.416
	No	2 (10.5)	8 (25.8)	1 (25)		
Health care facility has written policies and protocols relating to cleaning the delivery room	Yes	9 (47.4)	12 (38.7)	1 (25)	0.122	0.667
	No	10 (52.6)	19 (61.3)	3 (75)		
Regular audits undertaken in each ward to assess the availability of hand sanitizer, soap, single use towels and other hand hygiene resource	Yes	16 (84.2)	21 (67.7	2 (50)	2.565	0.265
	No	3 (15.8)	10 (32.3)	2 (50)		
Healthcare facility has a dedicated infection control focal person or committee	Yes	15 (78.9)	18 (58.1)	2 (50)	2.668	0.263
	No	4 (21.1)	13 (41.9)	2 (50)		
Presence of a clearly visible and legible up-to-date diagram of the facility management structure	Yes	9 (47.4)	16 (51.6)	0 (0)	3.809	0.149
	No	10 (52.6)	15 (48.4)	4 (100)		

HCF has adequate cleaners and maintenance staff	Yes	16 (84.2)	17 (54.8)	2 (50)	4.872	0.880
	No	3 (15.8)	14 (45.2)	2 (50)		
HCF has written guidelines pertaining to water, sanitation, and hygiene	Yes	11 (57.9)	13 (41.9)	0 (0)	4.671	0.097
	No	8 (42.1)	18 (58.1)	4 (100)		
Needed new sinks, taps or pipes but could not buy them in the previous year	Yes	10 (52.6)	20 (64.5)	3 (75)	1.051	0.591
	No	9 (47.4)	11 (35.5)	1 (25)		
All staff have a job description written clearly and legibly, including cleaners	Yes	16 (84.2)	29 (93.5)	2 (50)	6.163	0.046*
	No	3 (15.8)	2 (6.5)	2 (50)		
Contracted someone to complete tasks related to the maintenance and repair of your water source and/or distribution system	Yes	10 (52.6)	18 (58.1)	0 (0)	4.792	0.091
	No	9 (47.4)	13 (41.9)	4 (100)		
HCF has a mechanism to track the supply of IPC-related materials (such as hand sanitizer, gloves and protective equipment)	Yes	15 (78.9)	20 (64.5)	3 (75)	1.221	0.543
	No	4 (21.1)	11 (35.5)	1 (25)		
Healthcare personnel trained on infection prevention and control (IPC) every year	Yes	13 (68.4)	12 (38.7)	1 (25)	5.093	0.078
	No	6 (31.6)	19 (61.3)	3 (75)		
New cleaners and maintenance personnel receive infection prevention and control (IPC) training as part of their orientation	Yes	14 (73.7)	15 (48.4)	3 (75)	0.257	0.168
	No	5 (26.3)	16 (51.6)	1 (25)		

*Statistically significant

6.1.15. Factors associated with health care waste management status

Health care waste management was associated with a healthcare facility having a dedicated infection control focal person or committee ($\chi 2$ (2) = 7.630, p=0.022); and all staff responsible for cleaning received training on WASH ($\chi 2$ (2) =12.855, p=0.012). There was no statistically significant association between health care waste management and level of health facility, ownership and availability of cleaning protocols. These results are further elaborated in the table below;

Table 14: Factors associated with health care waste management status

Variable	Attribute	Waste management				P-value
		Basic (N=34) (%)	Limited (N=29) (%)	Un improved (N=1) (%)	χ^2	
Level of health facility	Health Centre III	14 (58.3)	20 (69.0)	1 (100)	7.209	0.103
	Health Centre IV	2 (8.3)	7 (24.1)	0 (0)		
	Hospital	8 (33.3)	2 (6.9)	0 (0)		
Ownership	Public	16 (66.7)	18 (62.1)	1 (100)	1.412	0.714
	PNFP	8 (33.3)	11 (37.9)	0 (0)		
Availability of cleaning protocols	Yes	13 (54.2)	9 (31)	0 (0)	3.611	0.164
	No	11 (45.8)	20 (69)	1 (100)		
In charge/ director communicates with the maintenance staff frequently enough to be aware of important WASH issues at the facility	Yes	22 (91.7)	20 (69)	1 (100)	4.433	0.109
	No	2 (8.3)	9 (31)	0 (0)		
Health care facility has written policies and protocols relating to cleaning the delivery room	Yes	12 (50)	10 (34.5)	0 (0)	2.101	0.366
	No	12 (50)	19 (65.5)	1 (100)		
Regular audits undertaken in each ward to assess the availability of hand sanitizer, soap, single use towels and other hand hygiene resource	Yes	20 (83.3)	18 (62.1)	1 (100)	3.352	0.187
	No	4 (16.7)	11 (37.9)	0 (0)		
Have an annual planned budget for the healthcare facility that includes funding	Yes	18 (75)	18 (62.1)	1 (100)	1.468	0.476
	No	6 (25)	11 (37.9)	0 (0)		

for WASH infrastructure (sinks, toilets, etc.), services (pit emptying) and personnel						
Healthcare facility has a dedicated infection control focal person or committee	Yes	20 (83.3)	14 (48.3)	1 (100)	7.630	0.022*
	No	4 (16.7)	15 (51.7)	0 (0)		
Presence of a clearly visible and legible up-to-date diagram of the facility management structure	Yes	14 (58.3)	11 (37.9)	0 (0)	3.077	0.215
	No	10 (41.7)	18 (62.1)	1 (100)		
Healthcare personnel receive infection prevention and control (IPC) training as part of their orientation program	Yes	19 (79.2)	16 (55.2)	1 (100)	3.192	0.141
	No	5 (20.8)	13 (44.8)	0 (0)		
High performing staff recognized and rewarded, while staff that do not perform well dealt with accordingly	Yes	13 (54.2)	11 (37.9)	1 (100)	2.754	0.276
	No	11 (45.8)	18 (62.1)	0 (100)		
HCF has adequate cleaners and maintenance staff	Yes	19 (79.2)	15 (51.7)	1 (100)	4.890	0.087
	No	5 (20.8)	14 (48.3)	0 (0)		
HCF has written guidelines pertaining to water, sanitation, and hygiene	Yes	13 (54.2)	11 (37.9)	0 (0)	2.217	0.330
	No	11 (45.8)	18 (62.1)	1 (100)		
All staff responsible for cleaning received training on WASH	None trained	2 (8.3)	14 (48.3)	0 (0)	12.855	0.012*
	Some	9 (37.5)	5 (17.2)	1 (100)		
	Yes	13 (54.2)	10 (34.5)	0 (0)		
Healthcare personnel trained on infection prevention and control (IPC) every year	Yes	15 (62.5)	11 (37.9)	0 (0)	4.121	0.127
	No	9 (37.5)	18 (62.1)	1 (100)		
At least a staff has been trained on WASH issues in healthcare facilities	Yes	13 (54.2)	8 (27.6)	1 (100)	5.325	0.070
	No	11 (45.8)	21 (72.4)	0 (0)		
HCF has a focal person(s) responsible for managing water, sanitation and hygiene resources for the healthcare facility (e.g., soap, chlorine, disinfectant, etc.)	Yes	21 (87.5)	18 (62.1)	1 (100)	4.779	0.092
	No	3 (12.5)	11 (37.9)	0 (0)		

*Statistically significant

6.1.15.1. Factors associated with environmental cleanliness status at HCFs

The environmental cleanliness status was statistically significantly associated with availability of cleaning protocols ($\chi 2$ (2) = 6.071, p=0.048); regular communication between the in charge and maintenance staff on issues regarding WASH ($\chi 2$ (2) =6.383, p=0.041); undertaking regular audits to assess availability of hygiene supplies such as soap and sanitisers ($\chi 2$ (2) =10.551, p=0.005); training of health care personnel on infection prevention and control (IPC) as part of their orientation program ($\chi 2$ (2) =7.329, p=0.026); training of all staffs involved in cleanings ($\chi 2$ (4) =13.982, p=0.007); and annual training of all health care personnel on infection control ($\chi 2$ (4) =11.074, p=0.004). These results are further summarised in the table below;

Table 15: Factors associated with environmental cleanliness status at health care facilities

Variable	Attribute	Environmental cleanliness				P-value
		Basic (N=21) (%)	Limited (N=38) (%)	Unimproved (N=5) (%)	χ^2	
Level of health facility	Health Centre III	14 (66.7)	18 (64.3)	3 (60)	6.130	0.187
	Health Centre IV	1 (4.8)	6 (21.4)	2 (40)		
	Hospital	6 (28.6)	4 (14.3)	0 (0)		
Ownership	Public	13 (61.9)	19 (67.9)	3 (60)	0.242	0.886
	PNFP	8 (38.1)	9 (32.1)	2 (40)		
Staff regularly appraised on their performance	Yes	17 (81)	27 (96.4)	4 (80)	3.351	0.187
	No	4 (19)	1 (3.6)	1 (20)		
Availability of cleaning protocols	Yes	12 (57.1)	10 (35.7)	0 (0)	6.071	0.048*
	No	9 (42.9)	18 (64.3)	5 (100)		
In charge/ director communicates with the maintenance staff frequently enough to be aware of important WASH issues at the facility	Yes	19 (90.5)	22 (78.6)	2 (40)	6.383	0.041*
	No	2 (9.5)	6 (21.4)	3 (60)		
Health care facility has written policies and protocols relating to cleaning the delivery room	Yes	11 (52.4)	10 (35.7)	1 (20)	2.363	0.307
	No	10 (47.6)	18 (64.3)	4 (80)		
Regular audits undertaken in each ward to assess the availability of hand sanitizer, soap, single use towels and other hand hygiene resource	Yes	19 (90.5)	19 (67.9)	1 (20)	10.551	0.005*
	No	2 (9.5)	9 (32.1)	4 (80)		

Have an annual planned budget for the healthcare facility that includes funding for WASH infrastructure (sinks, toilets, etc.), services (pit emptying) and personnel	Yes	17 (81)	17 (60.7)	3 (60)	2.464	0.292
	No	4 (19)	11 (39.3)	2 (40)		
Presence of a clearly visible and legible up-to-date diagram of the facility management structure	Yes	12 (57.1)	12 (42.9)	1 (20)	2.518	0.284
	No	9 (42.9)	16 (57.1)	4 (80)		
Healthcare personnel receive infection prevention and control (IPC) training as part of their orientation program	Yes	18 (85.7)	14 (50)	4 (80)	7.329	0.026*
	No	3 (14.3)	14 (50)	1 (20)		
HCF has written guidelines pertaining to water, sanitation, and hygiene	Yes	11 (52.4)	11 (39.3)	2 (40)	0.877	0.645
	No	10 (47.6)	17 (60.7)	3 (60)		
All staff have a job description written clearly and legibly, including cleaners	Yes	19 (90.5)	25 (89.3)	3 (60)	3.585	0.167
	No	2 (9.5)	3 (10.7)	2 (40)		
HCF has a mechanism to track the supply of IPC-related materials (such as hand sanitizer, gloves and protective equipment)	Yes	18 (85.7)	18 (64.3)	2 (40)	5.080	0.079
	No	3 (14.3)	10 (35.7)	3 (60)		
All staff responsible for cleaning received training	None trained	2 (9.5)	11 (39.3)	3 (60)	13.982	0.007*
	Some	11 (52.4)	3 (10.7)	1 (20)		
	Yes	8 (38.1)	14 (50)	1 (20)		
Healthcare personnel trained on infection prevention and control (IPC) every year	Yes	16 (76.2)	9 (32.1)	1 (20)	11.074	0.004*
	No	5 (23.8)	19 (67.9)	4 (80)		
At least a staff has been trained on WASH issues in healthcare facilities	Yes	11 (52.4)	10 (35.7)	1 (20)	2.363	0.307
	No	10 (47.6)	18 (64.3)	4 (80)		

*Statistically significant

6.1.16. WASH practices and behaviours for health practitioners and clients

6.1.16.1. Sanitation and Hygiene related practices in health care facilities

Cleaning processes

The cleaning processes described generally covered floors, walls and wards including beds and mattresses. Cleaning of floors generally involved dusting, sweeping and mopping. The commonest cleaning materials were water; disinfectants such as JIK, vim, liquid soap, and OMO; protective wears such as gloves and boots; and other tools for example scrubbers, blooms, and buckets. Some reported that they wear more than a pair of gloves.

> *"I put on gloves, before starting cleaning I first put on gloves, we cannot touch anything without gloves and we usually put on more than a pair of gloves" (Cleaner, Health care facility, Wakiso district)*

Cleaning was generally not done in the night by cleaners except for emergency events like vomiting. Besides the cleaning staff, respondents said that nurses assisted in cleaning areas which the cleaners may not clean/reach such as theatre and labour suite.

Frequency of cleaning

Most respondents indicated that generally the facilities were cleaned 2-3times daily (morning before start of any other activity, lunch and evening), but more often during rainy and busy days. Some cleaners reported more than 3 times, sometimes every after 30 minutes cleaning on most busy places such as the outpatient bathrooms, and maternity wards. However, it was reported that at some facilities, mopping was done once although sweeping twice a day. During the day, regular visits are conducted to check in case of any emergencies that may need cleaning for instance when a patient is discharged, and the room or bed is cleaned for the next patient.

> *"So, we clean in the morning, then monitor because there are emergencies and at times there are those who have been discharged and have left garbage so we remove it…for private rooms, there is no specific time because if a patient that has been occupying it leaves, we have to go and clean so that the next patient finds it clean" Kibuli*

Qualitative findings revealed that, based on the activities and nature of some departments such as maternity and laboratory, they are considered sensitive areas which should be cleaned most frequently and with extra caution.

> *"I clean the whole hospital daily, but the maternity is cleaned more because that is where patients stay, and it needs to be clean. Even the buckets where their rubbish is put has to be emptied regularly because they throw their used gloves and other material and if they stay for long, they can start smelling" (Cleaner, Health Centre III, Wakiso district)*

Patients unhygienic practices

Respondents reported instances when patients unnecessarily soil the facility by using toilets and wards and leaving them dirty. There were reports of mothers littering including leaving pumpers around wards which indicated lack of adequate sensitization of mothers and other patients about good hygiene practices.

6.1.16.2. Waste management

Sorting of wastes

Almost all respondents reported that waste is sorted at the generation point by staff and patients and their attendants using the colour codes of red, yellow and black as recommended.

> *"We put bin liners and we separate rubbish according to the code. Then after that, that rubbish is tied in the bin liner. Those which are sharps, blood, those which are not very infectious like bottles, we separate them according to the code" (Cleaner, PNFP hospital)*

Onsite disposal

Some respondents reported that waste from their facilities was managed onsite through use of pits and burning including incineration. Burning was affected by rainy days. In most public facilities, they revealed poor onsite waste disposal, full and smelly placenta pits.

"We throw our rubbish in a ditch behind the health centre…the sharp instruments are thrown in the placenta pit and the infectious waste is also dumped in the pit" Kyengera HCIV.

"We have one pit for the waste where we put the sharps waste as well, the other pit that we have is the placenta pit" (Cleaner Health centre III, Wakiso district)

Offsite disposal

Other respondents reported that wastes especially the sharps and infectious waste were collected by council authorities and contractors after 2-3 days. It was however a concern that the vans for collecting the waste sometimes delay which presents a huge challenge to the facilities.

"Sometimes these guys who come to collect them take a long time and you find we have wastes like for a full week and too much for us" (Cleaner, HCIV facility).

6.1.16.3. Faecal management

Almost all privately owned facilities used toilets which were connected to the national sewer or septic tanks while others had both latrine and toilets. A number of public facilities used latrines including those facilities which shared their facilities with communities which made it difficult to keep appropriate hygiene.

"Now, we really have a problem of the community the facility shares with the community the latrines. This makes my work hard because I keep cleaning all the time" (HCIII, Mukono district).

6.1.16.4. Limited use of hand washing facilities

Another concern was related to lack of proper sanitation and hygiene facilities such as hand washing at many health centres. Where available, the facilities were reportedly insufficient, or non-functional.

"Hand washing facilities are there in some facilities, ideally, it supposed to be in all. But you find that in some places either the tap got broken, the trough which collects the water after washing, in the process of washing is nit there or it's there but it's a white elephant with no water" (District official)

6.1.16.5. Utilities

Power sources

Electricity from the main grid was the main source of power at many facilities, although some respondents said solar was their main power source. For those mainly supplied by the grid, they reported power back up by stand-by generators or solar systems were reported which they used when main supply was not available, which was common.

Irregular power supply

Power was generally available in many facilities, however they reported power cuts lasting 1-3 days in some facilities. The major issues raised for lack of electricity were related to transformer issues, and unpaid bills. Although relied on for power backups, report revealed that use of solar and generators was still challenging because of rainy seasons and high fuel costs respectively.

> *"Well in the rainy season the solar is not efficient and the women and people in the wards use their torches for light, even I use a torch when there is no electricity, I place the torch on my boot for light" (Cleaner, Health Centre III, Wakiso district)*

Some respondents especially from public facilities said they didn't have power backups and reported total darkness and use of candles when main source of power was off.

> *"When there's no UMEME we have no power because we do not have a stand by generator when the power goes off, we remain in darkness" (Cleaner, Health Centre III, Wakiso district)*

Priority power supply

It was noted that generators and solar systems are installed in a way that ensures prioritized continuous power supply to sensitive departments especially theatre and maternity wards. While this approach to power supply is important for functioning of critical departments, besides lack of bulbs, the lack of light in other areas such as toilets generally affects limits proper hygiene practices.

"We use UMEME here and we also have solar however there is no solar in the lower buildings but there is solar in the maternity rooms. However, the problem we have is that some places have no bulbs and the biggest problem is that there is no light in the toilets so in the morning the toilets are very dirty because the women make them dirty during the night" (Cleaner, Health Centre III, Wakiso district)

Power affects cleaning routines

Although most respondents thought that lack of power didn't affect cleaning processes because they usually not worked in the night, most of them were concerned that patients soil the health facility especially toilets during darkness.

"There are very few instances though when people defecate outside at night because there is no light in the toilets" (Cleaner, Health Centre III, Wakiso district)

Water supply

Water sources: NWSC was the main source of water at most facilities. There were a number of public facilities that were not connected to the NWSC such as Nakifuma HCIII, but only relied on rain water (which was a challenge during the dry seasons)

"There are days when there is no water especially those dry seasons, when there is no water, I inform the in charge and he gets/ buys water from outside" (Cleaner, Health Centre III, Wakiso district)

For those with NWSC connections, in case of shortages, respondents reported several alternative sources including facilities water trucking, and facilities buying water from vendors, and patients resorting to neighbourhood/community sources about 5km away or spending 1,000UGX per jerry can. In almost all public facilities, patients are told to find the water themselves in case of shortages.

"we advise them to come with a jerry can of water…they try to find some water or buy because we can't do anything but when water is available everyone uses it freely, so they also understand the lack of it" (Cleaner, HC III, Mukono district).

Water shortage and rationing: Rationing of water was reported especially among public health facilities which experienced water shortages especially during dry seasons. For instance, at one of the health facilities a respondent said there are days when there is no water in the tank or when water available is restricted.

> *"Yes, those days are there but they are rare, usually happens during the dry seasons when there is no water in the tanks. The water in the tanks is mainly used by the medical officers, other people do not use it" (Cleaner, Health Centre III, Wakiso district).*

Drinking water

Most respondents reported that drinking water provided at their facilities was boiled. Some cleaners recounted that their facilities purchased drinking water which was stored in dispensers. While absent at most public facilities, drinking water was generally available for everyone in private facilities

> *"We have a machine which boils water and that water is taken to different points were people get water from. That machine boils water then for us we put in containers then we take to different points, no there are no restrictions, Water is always there anyone who wants water it's always there." (Cleaner, PNFP hospital)*

> *"That depends maybe at a level 3 because they do dots treatment, but not in the other facilities of which am not even sure because it is not like a must that where you enter you find drinking water" (District official)*

Poor storage of drinking water: In some facilities where water boiled, adequate storage facilities such as dispensers were desired. Respondents reported times when the containers cover fall down leaving water open to contamination.

> *"Or when patients give the water covers to children to play with and cockroaches fall in the water, so we pour it away and boil more" (Cleaner, Mukono district)*

6.1.16.6. Infection control

Infection control practices

Asked to describe their practices of infection control, almost all of them mentioned use of heavy-duty gloves, boots, and disinfectants such as jik. A few of the cleaners mentioned use of nose and mouse masks. Majority respondents said that they had uniforms and took extra caution when dealing with infectious wastes.

Supervision of cleaners

Reported by most key informants, supervision was also another practice of infection control. It was noted that supervision by ward in-charge and nurses was a way to ensure that cleaners were appropriately stationed and performed adequate cleaning.

Infection control training

Training staff in infection control is important for providing knowledge on how spread of infections persons including cleaners can be prevented. However, majority cleaners including some who started cleaning at some facilities since 2007 said they had no training in infection control. The few who reported having been trained in infection control said the training covered best cleaning practices such as proper use of recommended gloves, waste segregation, and self-protection against infections including hand washing.

> ***"****They talk about the importance of putting heavy duty gloves, not these ordinary gloves, how to handle particular wastes like infectious, highly infectious and non-infectious" (Cleaner, Kampala district).*

Some of those who reported they had been trained in infection control revealed an informal approach of training by their in-charges and other health workers who usually told them how to control infections. Others respondents said that they were informed on job about best practices by their own cleaning colleagues when they first reported too workplace while a number of them said they were not trained even when they first reported as cleaners.

> *"But I have never attended any training my boss just gave me what to use and asked ne whether I know what to do and said yes" (PNFP Health Centre III)*

Of those who had received training in infection control, some reported they last trained 10 years ago. Although irregular, all believed infection control trainings would be beneficial due to the nature of their work, for the safety of patients, and the training content.

> *"It helped me because in the hospital there are so many diseases and so many people who come and we don't know them so they taught us how to work in the toilet, how to deal with blood, when someone vomits what to do, how to deal with urine, children suffering from measles, how to avoid TB and also how to avoid HIV. They taught us how we can be protected and what you have to use like you need a mask and every ward you enter its compulsory that you have to be putting on gloves' (Cleaner, PNFP hospital)*

Inadequate training

Some key informants from facilities that had received some training had concerns that the trainings were short and lacked demonstration materials. They said that use of demonstration materials such as images, and charts would be important in enhancing learning especially for many workers such as cleaners who have low level of education.

> *"They are short, and what they lack is demonstration materials basically because my workers on ground are not educated. They need illustrations that were in picture form, after the training you leave at least something on those boards where somebody can recap, instead of only use of projectors followed by handouts. The education level of my cleaners is zero so that's the challenge" (Public hospital manager)*

6.1.16.7. Inhibitors of desired WASH practices

Respondent were also asked to make recommendations which ranged from provision of supplies to ensuring regular training in infection control.

Inadequate supplies

Lack of enough supplies was a general challenge. In response, all cleaners called for timely provision of adequate cleaning supplies such as jik, dust bins, and soap they said was irregularly available at hand washing facilities. In some public facilities, some cleaners reported that

sometimes they buy their own latex disposable gloves. They said that lack of adequate cleaning materials makes it difficult to ensure proper cleaning.

> *"At times we need bin liners to put in those dustbins so that it is easy for us to take them were we deposit them but at times we don't have bin liners and it's very hard to wash those dustbins mostly blood, when it is full of blood, now the effects we have at the times when those bin liners are out of stock. We find our work hard" (Cleaner PNFP hospital).*

> *"[Silence], me it's only because of God. Do you know sometimes I clean using water only with no jik, my supervisor says that I waste those things. It isn't easy for me, so I am just bearing to be here" (Cleaner, PNFP Health centre III, Wakiso district).*

The issue of limited funds to secure enough materials for cleaning and other WASH related activities especially in public facilities was stressed by key informants.

> *"The big issue is basically the medical supplies because we have the clients are available the big issue is supplies. I think if it is the limited budgets that the government give that curtails the human resource and willingness" (Hospital administrator).*

> *"The other problem is at times we can go two weeks without good cleaning material like rugs and when I inform the in charge, he says there is no money" (Cleaner, public health facility, Wakiso district).*

Lack of awareness

It was reported that some people at the health facility lack awareness on good hygiene practices such as waste segregation which created double work for cleaners who have to segregate the waste before disposal. Patients also reportedly had negative attitude and practiced undesirable practices to ensure that the cleaners have work to do. Some respondents mentioned that some patients at the outpatients do not know how to use the toilet which causes and difficulty in cleaning and also wastage of resources.

> *"The problem is that our patients going to the toilet and throwing the toilet paper in the water and when you have just put it there by the time you go to check it's already*

soaked in water and so no one can use it so you have to replace it" (Cleaner, Health Centre IV, Mukono district).

Limited water supply

Asked about what they thought was the biggest issue regarding water and sanitation and hygiene at the facility, some reported lack of enough water which affects hygiene of facilities. In some instances, toilets are closed, and patients requested to understand the situation.

"The problem is water, because when water goes, the toilets are dirty and when the tank is dry, we face challenge, you can't tell a patient to flash, I close them [toilets]. They [patients] complain but I explain to them" (Cleaner, Kampala public health centre III)

Need for constant water supply was emphasized. At some facilities, intermittent water supply was said to last up to 3 day. In addition to lack of NWCS and lasting alternative water sources- for back up, some facilities had no storage tanks.

"It would be nice if we had a constant supply of water because during the dry seasons the water is used up as we just have one tank. They should bring national water so that we have a backup supply of water" (Cleaner, Public Health Centre III, Wakiso district).

Repair and maintenance of pipes was also recommended to ensure proper flow of water in the system.

"Well I think the pipes should be worked on and cleaned so that water can flow in the rooms because usually water is in the tank but can't get through the taps" (Cleaner, Public Health Centre III, Wakiso district).

Technology limitation

Respondents were also concerned about the limited technology of some of the WASH facilities, which can also become infectious.

"You know those WASH services we have they are also infectious. You see like the bottles we have for soap; we touch there and also another person can come and touch

there. I don't know whether the technology can change. There are some hospitals where they use anchors others sense you just put there and the machine senses that you are there water pours there and soap you clean yourself and dry yourself there but here its touching everywhere, we touch, and infections are continuing all over the hospital. So, if that technology can improve, that can be better, it would reduce infections in the hospital" (Cleaner, PNFP hospital).

When a key informant was asked if they had conducted any sensitizations on WASH in health care facilities, one of the district health managers was quoted saying;

"Hand washing, we have not done it in facilities we usually do it in the community and we promote hand washing facilities in the community. In the facility we know by default, so we have not gone there to do a demo of hand washing but in communities where we do CLTS (Community Led Total Sanitation), a hand washing facility is one of the packages that is pushed out there" (District health manager)

Regarding when should a health worker wash their hands, another district health manager was quoted saying;

"Every time after they have touched a patient, they are supposed to wash even if they were wearing gloves. Like now am looking at somebody at the dispensing window, you're going to be touching tablets probably you don't have a spoon, so you're supposed to wash your hands, your clerking patients in between patients your supposed to wash. You have seen this one examined them wash like that" (District health manager)

The respondents were also asked about the importance of WASH in health facilities, some key informants agreed that its critical especially in the maternity ward. In this regard, was quoted saying;

"Yeah because a labour suit is supposed to be clean, you're dealing with life and death, so you're supposed to deliver a mother in a clean setting actually when we go and a labour suit is not clean and we have gone for supervision, we are usually hard on those midwives and we are like what kind of mothers are you. Would you deliver in such a facility you yourself being a woman?" (District health manager)

"I know somebody needs to give birth in an environment whose cleanliness is near to theatre cleanliness and premises where mother can deliver and easily access a bathroom because they need to wash cause in like the clinic where I also supervise for the ministry if somebody is putting up a clinic that will even deliver a mother we usually advice that let labour suit be connected to bathroom so that the mothers can have easy access" (District health manager)Asked about what challenges do health facilities in Mukono face in terms of WASH.

"*Like those ones that have a filled up latrine, they may run for many years when they have not dug for them another one because it depends on planning period and whether money has been allocated to that and now there is not so much money that comes under capital development, it is the sub county that is supposed to take the initiative to put it in their plans to construct a facility for them. That is why when you were asking how can a mid-wife handle, you may find that even an In charge, his budget cannot construct a latrine so they have to wait and keep informing sub county chief they don't have a facility till they put it up for them so there are those challenges within means of people and those that are not. Also, some places do not have cleaners, in the dry season if it is a community borehole the entire community will come even the health workers will need to use the facility" (District health manager)*

6.1.17. Management systems of WASH sustainability in HCFs

In order to assess the indicators for management systems of WASH sustainability in HCFs, 63 Key informants (1 per HCF) were conducted with in-charges or administrators, one at each facility. The results on the present in the Table below: It is intriguing that only 6.2% of HCFs had ever had their water tested within the facility.

Table 16: Indicators for management systems of WASH sustainability in HCFs

Indicators for management systems of WASH sustainability in HCFs	Percentage (%) N=65
% of HCFs where staff are regularly appraised on their performance	86.2
% of HCFs where a manager makes sure that there is sufficient funding for the supplies associated with WASH	75.4
% of HCFs where a manager/ in charge is ultimately responsible for the sustainability of the WASH infrastructure, conditions, and behaviours.	86.2
% of HCFs where a manager/ in charge thinks spending time learning about WASH is a good use of his/her time	96.9
% of HCFs where a manager/ in charge thinks it is his/her responsibility to ensure that staff at the hospital are educated about IPC and WASH	87.7
% of HCFs where a manager/ in charge where a manager thinks overseeing the maintenance of WASH infrastructure, including preventative maintenance and repairs, is his/her responsibility.	84.6
% of HCFs with a budget for the maintenance of the healthcare waste incinerator	30.8
% of HCFs with cleaning protocols	43.1
% of HCFs where a manager/ in charge communicates with the maintenance staff frequently so that they are aware of important WASH issues at the facility	83.1
% of HCFs with written policies and protocols available within the facility relating to cleaning the delivery room	41.5
% of HCFs where regular audits of each ward are undertaken to assess the availability of hand sanitizer, soap, single use towels and other hand hygiene resources	67.7

% of HCFs with an annual planned budget for the healthcare facility that includes funding for WASH infrastructure	69.2
% of HCFs with a dedicated infection control focal person or committee	61.5
% of HCFs with an up-to-date diagram of the facility management structure clearly visible and legible	47.7
% of HCFs where new healthcare personnel receive infection prevention and control (IPC) training as part of their orientation program	63.1
% of HCFs where high performing staff recognized and rewarded, while staff that do not perform well dealt with accordingly	49.2
% of HCFs with adequate cleaners and maintenance staff	63.1
% of HCFs with written guidelines pertaining to water, sanitation, and hygiene for the healthcare facility	46.2
% of HCFs that needed new sinks, taps or pipes but could not buy them	56.9
% of HCFs where all staff have a job description written clearly and legibly, including cleaners	87.7
% of HCFs that assigned or contracted someone to complete tasks related to the maintenance and repair of your water source and/or distribution system	44.6
% of HCFs where activities related to ensuring the daily availability and function of water, sanitation and hygiene infrastructure (sinks, toilets, etc.) shared across more than one staff person	69.2
% of HCFs where someone has tested and/or monitored the water quality within the facility	6.2
% of HCFs with a mechanism to track the supply of IPC-related materials (such as hand sanitizer, gloves and protective equipment)	67.7
% of HCFs where cleaners and maintenance personnel receive infection prevention and control (IPC) training as part of their orientation	47.7
% of HCFs where staff responsible for cleaning the delivery room received training in the last 24 months	36.9
% of HCFs where new cleaners and maintenance personnel receive infection prevention and control (IPC) training as part of their orientation	58.5
% of HCFs where all healthcare staff (including cleaners) received training on sorting, storage and elimination of healthcare waste (e.g. used needles,	58.5

bandages, tubes) in the last 24 months	
% of HCFs where staff have been trained on WASH issues in healthcare facilities	41.5
% of HCFs with a focal person who is responsible for managing the daily availability and function of water, sanitation and hygiene infrastructure for the healthcare facility	70.8
% of HCFs with a focal person who is responsible for managing water, sanitation and hygiene resources for the healthcare facility (e.g., soap, chlorine, disinfectant, etc.)	72.3

CHAPTER SEVEN

7.1. DISCUSSION

This study revealed that 48.1% of the health care facilities had a limited water service; 85.2% had a limited sanitation service; more than half (51.9%) had a limited environmental cleanliness service; 57.4% had limited hand hygiene service, and 53.7% had a limited health care waste management service. Water service status was associated with the level of health care facility (p=0.004); ownership (p=0.050); regular staff appraisal on performance (p=0.042); frequent communication between the in charge and maintenance staff about WASH issues; undertaking regular audits in wards to establish availability of hand sanitizer and soap (p=0.033) and presence of a clearly visible and legible up-to-date diagram of the facility management structure (p=0.012).

Access to water supply unlike provision of sanitation and hygiene services and waste management is well mainstreamed. In this case, the role of the ministry of water and environment, umbrella organisations, and National Water and Sewerage Corporation are clearer than the roles played by the ministries of water and environment, health and local government in sanitation and hygiene and waste management. Therefore, domains that are well mainstreamed in the different ministries are likely to have higher scores compared to ones that are not. Water service status was associated with the level of health care facility due to the fact that hospitals and health centre IVs receive more WASH supplies compared to lower level facilities possibly due to the high volume of patients and staff. Staff appraisals may also be a driver to water service status since the health facility staff may want to be a contribution to the safety and smooth running of the health unit. Communication between the health facility managers and maintenance staff was also associated with the water service status. This could be attributed to the timely maintenance of water facilities in the health care unit.

This study revealed that only 6.2% of the health care facilities had tested or monitored the water quality. This indicates that water quality is not prioritised; or facilities lack knowledge of existence of expertise on water quality assessments. Consequently, 10% (6/60) of the health care facilities did not meet the WHO microbial water quality guidelines of 0 CFU E. coli per 100mL

sample. This is lower than what that was reported in a study by (Huttinger et al., 2017) which indicated that over 25% of 12 water samples in selected rural health care facilities in Rwanda did not meet the WHO standards of microbial quality of water. The low microbial quality of water in health care facilities could be attributed to a lack of cleaning of storage reservoirs such as water tanks and poor environmental sanitation surrounding the water sources. Similarly, those conditions would explain why almost a quarter of the mothers thought that the water at the different health care facilities was unsafe. A recent review of WASH in health care facilities indicates that poor WASH provision is with significant patient dissatisfaction with infrastructure and quality of care (Bouzid et al., 2018). Bouzid et al. (2018), however, points out that dissatisfaction with WASH facilities usually relates to the client's expectation, which is strongly influenced by patients' socioeconomic status and level of education.

Based on the JMP scores, hand hygiene had the overall minimum score (1.0) and this could be attributed to the lack of an enabling environment for hand washing for instance presence of hand washing stations with water and soap. A study by Wasswa et al. (2015) indicated that healthcare workers were more likely to wash their hands if they have ever suffered from a nosocomial infection, received in-service training on infection control, were educated beyond ordinary level, or knew hand washing as one of the infection control measures. The factors could be affecting hand hygiene in health care facilities in the study area.

This study revealed that only 41.5% of HCFs train staff on WASH issues in healthcare facilities. This is by far lower than the expectation of all health care facilities being able to provide this training as it is part and parcel of infection control. Facilities that are unable to provide training on WASH could be grappling with competing priorities, or lack adequate resources to facilitate such trainings. In addition, some managers may not consider WASH as an important aspect of health care. In relation to this, the fact that 3.1% of HCFs managers/ in charge/s thought spending time learning about WASH was not good use of their time indicates the need for behavioural change interventions to influence attention to WASH. Influencing the WASH perceptions of the managers would be critical in ensuring sustainability of WASH interventions in health care facilities.

CHAPTER EIGHT

8.1. Conclusion

Generally, HCFs lacked adequate WASH services. 53.7% lacked a basic water service; 98.2% lacked a basic sanitation service; 64.8 lacked a basic hand hygiene service; 55.6 lacked a basic waste management service and 61.2% lacked a basic environmental cleanliness service. Specifically, 48.1% of the health care facilities had a limited water service; 85.2% had a limited sanitation service; more than half (51.9%) had a limited environmental cleanliness service; 57.4% had limited hand hygiene service, and 53.7% had a limited health care waste management service. The factors associated with water service status included; the level of health care facility (p=0.004); ownership (p=0.050); regular staff appraisal on performance (p=0.042); frequent communication between the in charge and maintenance staff about WASH issues; undertaking regular audits in wards to establish availability of hand sanitizer and soap (p=0.033) and presence of a clearly visible and legible up-to-date diagram of the facility management structure (p=0.012). Health care waste management status was associated with having a dedicated infection control focal person or committee (P=0.022); training of all staffs involved in cleaning on WASH (p=0.012). The environmental cleanliness status was statistically significantly associated with availability of cleaning protocols (p=0.048); regular communication between the in charge and maintenance staff on issues regarding WASH (p=0.041); undertaking regular audits to assess availability of hygiene supplies such as soap and sanitisers (p=0.005); training of health care personnel on infection prevention and control (IPC) as part of their orientation program (p=0.026); training of all staffs involved in cleanings (p=0.007); and annual training of all health care personnel on infection control (p=0.004). Conversely, hygiene status of health care facilities was statistically significant associated with having a clear and legible job description (p=0.046).

Regarding WASH practices and behaviours; this study revealed that health care facilities were cleaned between 2-3times daily. In line with waste management, qualitative interviews indicated indiscriminate health care waste onsite disposal as well as delays by contractors in collecting medical wastes. The use of hand hygiene was also limited since many facilities did not have them. Effective cleaning routines at health care facilities were mainly affected by unreliable

supply of electricity. Improvement of WASH practices in the study facilities was through the supervision of janitorial staff and provision of cleaning supplies such soap. However, efforts towards better WASH practices were marred by inadequate supplies, lack of awareness on hygiene practices and limited water supply. In line with WASH management systems, only 43.1% of HCFs had cleaning protocols; only 41.5% had written policies and protocols relating to cleaning the delivery room available within the facility; only 6.2% of HCFs where someone has tested and/or monitored the water quality within the facility, and 47.7% of the HCF had provided orientation on infection prevention and control (IPC) to their cleaners and maintenance personnel.

8.2. Recommendations

S/n	Issue	Recommendations to who and on how to deal with it
1.0	Development of WASH in HCFs national guidelines	○ *Ministry of Health, Environmental Health Department* should develop and incorporate WASH in Health Care Facilities national guidelines in the national Sanitation policy framework to support and guide planning budgeting and execution of WASH in HCFs services at all health facility levels
2.0	Sensitisation of health care providers on the importance of WASH and IPC in HCFs	○ *Ministry of Health, Health Promotion, Education and Strategic Communication Division, jointly with the Environmental Health Department* should develop and scale up Hygiene Behaviour Change campaigns/interventions. These can be either as standalone interventions where possible or integrated in ongoing services like routine Immunisation campaigns or Continuous Medical Education (CMEs) for all staff at health care facilities. The study findings indicate that improved staff and patients attitude towards WASH in Health Care facilities can contribute to improved WASH services at HCFs.
3.0	Strengthening operation and maintenance of WASH facilities in HCF	○ The MOH should ensure that all HCFs have well constituted and functioning Health Unit Management committees (HUMC) ○ The in-charges of HCFs and HUMC should ensure that they have well-functioning WASH/IPC committees/personnel with clear job descriptions.
4.0	Increasing resource allocation to WASH in HCFs vote function	○ The Ministry of Health (MoH) should increase resource allocation to Vote 0881 Primary Health Care and Sanitation Services grant-specifically under Transitional Development – Health Ad Hoc grant with a directive to local government and other implementing agencies to use these funds for WASH facilities infrastructure rehabilitation or construction in health care facilities especially for HCFs in the rural areas
5.0	Promotion of gender sensitive and mobility friendly WASH facilities	○ The Ministry of Health Jointly with Ministry of Gender Labour and Social Development and Ministry of Water and Environment should promote construction of female friendly Sanitation facilities for all new constructions and empower communities to support WASH/IPC programmes in HCFs.
6.0	Advocacy for WASH in HCFs	○ *Partners* should support MoH in advocating for developing the WASH in HCFs guidelines and increased resource allocation to WASH in HCFs.
9.0	Inspections in wards to assess WASH	○ *Kampala Capital City Authority (KCCA)* and other relevant local governments should conduct regular health facility

	status establish availability of hygiene and cleaning supplies	sanitary inspections so as to identify and provide guidance on the mitigation of WASH related challenges. o *The In-charges of HCFs* should ensure that they conduct regular audits in wards to establish the presence of hygiene and cleaning supplies

References

AIREDE, A. K. I. 1992. Neonatal septicaemia in an African city of high altitude. *Journal of tropical pediatrics,* 38**,** 189-191.

ALI, S. M., ALI, S. M., ALI, A. O., FAULKNER, S., GON, G., GRAHAM, W. J., HAJI, H. S., KABOLE, I., KAHABUKA, C. & MORRISON, E. 2015. IMPROVING MATERNAL AND NEWBORN HEALTH IN ZANZIBAR: A needs assessment of IPC and WASH.

ALI, T. S., FIKREE, F. F., RAHBAR, M. H. & MAHMUD, S. 2006. Frequency and determinants of vaginal infection in postpartum period: a cross sectional survey from low socioeconomic settlements, Karachi, Pakistan. *Journal of Pakistan Medical Association,* 56**,** 99.

ALKEMA, L., CHOU, D., HOGAN, D., ZHANG, S., MOLLER, A.-B., GEMMILL, A., FAT, D. M., BOERMA, T., TEMMERMAN, M. & MATHERS, C. 2016. Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: a systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. *The Lancet,* 387**,** 462-474.

ALLEGRANZI, B., NEJAD, S. B., COMBESCURE, C., GRAAFMANS, W., ATTAR, H., DONALDSON, L. & PITTET, D. 2011. Burden of endemic health-care-associated infection in developing countries: systematic review and meta-analysis. *The Lancet,* 377**,** 228-241.

BARTRAM, J. & CAIRNCROSS, S. 2010. Hygiene, sanitation, and water: forgotten foundations of health. *PLoS medicine,* 7**,** e1000367.

BOUZID, M., CUMMING, O. & HUNTER, P. R. 2018. What is the impact of water sanitation and hygiene in healthcare facilities on care seeking behaviour and patient satisfaction? A systematic review of the evidence from low-income and middle-income countries. *BMJ Global Health,* 3**,** e000648.

CAVANAGH, S. 1997. Content analysis: concepts, methods and applications. *Nurse researcher,* 4**,** 5-16.

CRESSWELL, P. & MONROUXE, L. V. 2018. 'And you'll suddenly realise 'I've not washed my hands': medical students', junior doctors' and medical educators' narratives of hygiene behaviours. *BMJ open,* 8**,** e018156-e018156.

CRONK, R. & BARTRAM, J. 2018. Environmental conditions in health care facilities in low- and middle-income countries: coverage and inequalities. *International journal of hygiene and environmental health,* 221**,** 409-422.

DEARDEN, K. A., SCHOTT, W., CROOKSTON, B. T., HUMPHRIES, D. L., PENNY, M. E. & BEHRMAN, J. R. 2017. Children with access to improved sanitation but not improved water are at lower risk of stunting compared to children without access: a cohort study in Ethiopia, India, Peru, and Vietnam. *BMC public health,* 17**,** 110.

GON, G., RESTREPO-MÉNDEZ, M. C., CAMPBELL, O. M. R., BARROS, A. J. D., WOODD, S., BENOVA, L. & GRAHAM, W. J. 2016. Who Delivers without Water? A Multi Country Analysis of Water and Sanitation in the Childbirth Environment. *PLOS ONE,* 11**,** e0160572.

GRANEHEIM, U. H. & LUNDMAN, B. 2004. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse education today,* 24**,** 105-112.

HSIEH, H.-F. & SHANNON, S. E. 2005. Three approaches to qualitative content analysis. *Qualitative health research,* 15**,** 1277-1288.

HUTTINGER, A., DREIBELBIS, R., KAYIGAMBA, F., NGABO, F., MFURA, L., MERRYWEATHER, B., CARDON, A. & MOE, C. 2017. Water, sanitation and hygiene infrastructure and quality in rural healthcare facilities in Rwanda. *BMC health services research,* 17**,** 517-517.

ICCDR, B. 2014. Bangladesh National Hygiene Baseline Survey Preliminary Report.

KASSEBAUM, N. J., BERTOZZI-VILLA, A., COGGESHALL, M. S., SHACKELFORD, K. A., STEINER, C., HEUTON, K. R., GONZALEZ-MEDINA, D., BARBER, R., HUYNH, C. & DICKER, D. 2014. Global, regional, and national levels and causes of maternal mortality during 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet,* 384**,** 980-1004.

LARSON, E. & KRETZER, E. 1995. Compliance with handwashing and barrier precautions. *Journal of Hospital infection,* 30**,** 88-106.

MINISTRY OF HEALTH. 2018. *NATIONAL HEALTH FACILITY MASTER LIST. A complete list of all health facilities in Uganda. Division of Health Information (DHI). Ministry of Health, Kampala.* [Online]. [Accessed].

MOFFA, M., GUO, W., LI, T., CRONK, R., ABEBE, L. S. & BARTRAM, J. 2017. A systematic review of nosocomial waterborne infections in neonates and mothers. *International journal of hygiene and environmental health,* 220**,** 1199-1206.

MULOGO, E. M., MATTE, M., WESUTA, A., BAGENDA, F., APECU, R. & NTARO, M. 2018. Water, Sanitation, and Hygiene Service Availability at Rural Health Care Facilities in Southwestern Uganda. *Journal of environmental and public health,* 2018.

NATHOO, K., MASON, P. & CHIMBIRA, T. 1990. Neonatal septicaemia in Harare Hospital: aetiology and risk factors. The Puerperal Sepsis Study Group. *The Central African journal of medicine,* 36**,** 150-156.

NYIRENDA, D. C. & FERREY, S. 2018. WASH in health care facilities: reinforcing existing structures and best practices.

OZA, S., LAWN, J. E., HOGAN, D. R., MATHERS, C. & COUSENS, S. N. 2014. Neonatal cause-of-death estimates for the early and late neonatal periods for 194 countries: 2000–2013. *Bulletin of the World Health Organization,* 93**,** 19-28.

RAMSEY, C. A. & HEWITT, A. D. 2005. A methodology for assessing sample representativeness. *Environmental Forensics,* 6**,** 71-75.

UBOS 2014. National population and housing census 2014. Uganda Bureau of Statistics Kampala (Uganda).

UBOS & ICF 2017. Uganda demographic and health survey 2016: key indicators report. UBOS, and Rockville Maryland.

UNICEF, W. H. O. 2019. WASH in health care facilities. *Global baseline report 2019.* World Health Organization.

VAN DILLEN, J., ZWART, J., SCHUTTE, J. & VAN ROOSMALEN, J. 2010. Maternal sepsis: epidemiology, etiology and outcome. *Current opinion in infectious diseases,* 23**,** 249-254.

WASSWA, P., NALWADDA, C. K., BUREGYEYA, E., GITTA, S. N., ANGUZU, P. & NUWAHA, F. 2015. Implementation of infection control in health facilities in Arua district, Uganda: a cross-sectional study. *BMC infectious diseases,* 15**,** 268-268.

WHO 2011. Report on the burden of endemic health care-associated infection worldwide.

WHO 2014. *Antimicrobial resistance: global report on surveillance*, World Health Organization.

WHO. 2018. *Maternal mortality* [Online]. World Health Organisation. Available: https://www.who.int/news-room/fact-sheets/detail/maternal-mortality?fbclid=IwAR2_c-o534rz4QafDLXoufml1mz1f-Brrpxl3srhA5mj30bFYJzieanHHEI [Accessed 7 July 2019].

WHO & UNICEF 2012. Countdown to 2015 maternal, newborn and child survival: building a future for women and children. *Washington DC: World Health Organization and UNICEF*.

WHO & UNICEF 2015. Water, sanitation and hygiene in health care facilities: status in low and middle income countries and way forward.

ZAIDI, A. K., HUSKINS, W. C., THAVER, D., BHUTTA, Z. A., ABBAS, Z. & GOLDMANN, D. A. 2005. Hospital-acquired neonatal infections in developing countries. *The Lancet,* 365**,** 1175-1188.

APPENDICES

Informed consent form for key informants

Water, sanitation and hygiene (WASH) status in HCFs in Wakiso, Kampala and Mukono districts.*".*

1. Introduction

Hello, I am…….. working on a research study ". Water, sanitation and hygiene (WASH) status in HCFs in Wakiso, Kampala and Mukono districts

". You are being asked to volunteer for a research study. The Principal Investigator for this study is Dr. John Bosco Isunju. The Sponsor of the study is WaterAid Uganda.

2. Purpose of this research study

The specific objectives of this study include: establish the status of WASH (water supply and quality, sanitation, hygiene, waste management and cleaning routines) in HCFs; assess the WASH practices and behaviours for both health practitioners and clients in HCFs; assess factors associated with status of WASH in HCF; assess management systems for WASH sustainability in HCFs (policies, guidelines, budgets/budget gaps, HR/responsibilities, structures, plans) as well as Recommend appropriate models (management and service delivery) for WASH sustainability in HCFs

3. Length of your participation

Your participation in the study will last about 60 minutes.

4. Where the study is being done and number of people participating

This study is taking place at 63 HCFs in Kampala, Wakiso and Mukono districts.

5. Study procedures

You have been selected to participate in this study. If you consent, you were asked some questions about your experience of delivery and WASH services at this HCF and your answers were recorded on this form. Observations were made in selected departments and 1 water sample were taken form of points of use.

6. Possible risks or side effects of taking part in this study

No possible risks.

7. Possible benefits to you for taking part in the Study

There are no direct benefits to you for participating in this study. However, your participation in this study may add to the scientific knowledge about WASH status and related factors. We hope the results of this study will also lead to the overall improvement of the health status of especially mothers and children that use services here.

8. About participating in this study

Your participation in this study is voluntary. You may stop participating in this study at any time. Your decision not to take part in this study or to stop your participation will not affect your medical care or any benefits to which you are entitled.

9. Compensation for taking part in this study

No compensation for participation in this study were provided.

10. Confidentiality of study records and medical records

Your participation is voluntary and all the information given to me were treated with utmost confidentiality. In the event of any publication regarding this study, your identity will not be disclosed.

11. Names of Contacts for Questions about the Study

If you have any questions about taking part in this study, or if you think you may have been injured because of the study, call Dr. John Bosco Isunju on +256 772346304.

Otherwise do you have any questions for me before we proceed? Would you be willing to participate in our study? If you are willing, please read the volunteer's statement and sign this consent form in the space provided below.

12. VOLUNTEER'S STATEMENT

I have been given a chance to ask questions about this research study. These questions have been answered to my satisfaction. I have been informed that if later I have any questions about taking part in this study, I may contact Dr. John Bosco Isunju on 0772346304. I understand that my participation in this research project is voluntary. I know that I may quit the study at any time.

I understand that my participation in this research project is voluntary. I know that I may quit the study at any time. I also understand that the Investigator in charge of this study may decide at any time that I should no longer participate in this study. If I have any questions about my rights as a research subject in this study, I may contact the chairperson:

Dr. Suzanne Kiwanuka on 0772886377 Higher Degrees, Research and Ethics Committee, Makerere University School of Public Health,

P.O. Box 7072, Kampala, Uganda.

By signing this consent form, I have not waived any of my legal rights or released the parties involved in this study from liability for negligence. I have read and understand the above information. I agree to participate in this study. I have informed that I were given a signed copy of this form for my own records.

Name of Participant	Signature or thumbprint of Participant	Date
Name of Person Obtaining Consent	Signature of Person Obtaining Consent	Date
Name of Witness	Signature of Witness	Date

Key Informants guide for the District staff

e.g. DHO, Assistant DHO (MCH)/District Health Inspector)/NGO staff and Frontline Health workers.

Study title: Water, sanitation and hygiene (WASH) status in HCFs in Wakiso, Kampala and Mukono districts.

1. What is the status of water, sanitation and hygiene services in health facilities in Kampala, Mukono and Wakiso? Probe for type of water sources available, type of latrine facilities available, functionality and number of latrines and stances, presence of latrine facilities segregated by sex, presence and functionality of hand washing facilities, availability of soap at hand washing facilities, cleanliness of walls, beds and hand-washing stations. Also ask if the health facilities have:
    I. drinking water available for patients,
    II. bath shelters with water available all the time,
    III. facilities and supplies for health workers to practice hand hygiene (probe for the moments when health care workers wash their hands),
    IV. Latrines/toilets in good conditions with privacy, no smells, and no flies
    V. Clean labour and postnatal ward. *Probe for cleaning routines*

    Probe for factors that influence the status of WASH in health care facilities.

2. How does the WASH (accessible and treated water, clean environment, clean latrine/toilet facilities, presence of hand washing facilities with soap) status of a health facility influence choice of where to deliver from? *What are your suggestions for improving delivery services at hospitals in Kampala, Mukono and Wakiso?*
3. Is it common to find mothers and neonates with blood infections in health facilities in Kampala, Mukono and Wakiso? Probe for infections in children and the risks of getting infections including sepsis from the hospital and homes. What can be done to prevent infections in mothers and neonates?
4. Are there any organisations that are implementing WASH interventions (construction of sanitation facilities, construction of water tanks, health education……e.t.c) in health facilities in *Kampala, Mukono and Wakiso*? *If yes, which organisations are these which specific interventions are they implementing?*
5. What is the status of hospital acquired infections in Kampala, *Mukono and Wakiso*? What are the common hospital related acquired infections in Kampala? *Probe for prevalence of maternal and neonatal sepsis in Kampala, Mukono and Wakiso.*
6. What are your recommendations for improving delivery services and prevention of maternal and neonatal sepsis and other hospital acquired infections in *Kampala, Mukono and Wakiso*?

Structured questionnaire for Health facility in-charges/administrators (WASH Status)

I am _____from _____ working on a research study "Study title: Water, sanitation and hygiene (WASH) status in HCFs in Wakiso, Kampala and Mukono districts".

You have been identified as one of the Key Informants and I kindly request you to participate in this study by responding to some questions.

Interviewer:……

Title of the respondent:……

Profession of the respondent:…….

SECTION 1: IN-CHARGE INTERVIEW Interview the hospital director and/or deputy director. If the director does not know the answers, you should try to speak with the maintenance person or administrator if time permits.	
Respondent 1. In-charge 2. Administator	
DISTRICT 1. Kampala 2. Wakiso 3. Mukono	Type of Area: 1. Urban 2. Rural
Facility Type: 1. Hospital 2. HC IV 3. HC III	Type of Ownership: 1. Public 2. Private Not for Profit

B1	Please tell me which of the following sources of water are available at the hospital/HC: (Read all options aloud. Check all that apply) Note: The question refers to the source of water for general purposes, not only for drinking	☐ Piped into facility ☐ Piped to facility grounds ☐ Public tap/standpipe ☐ Tubewell /borehole ☐ Protected dug well ☐ Unprotected dug well ☐ Protected spring ☐ Surface water ☐ Rainwater collection ☐ Bottled water ☐ Cart w/small tank/drum ☐ Tanker truck ☐ Other ☐ Don't know ☐ No response ☐ No water source	Water Quantity & Access
B2	If there is more than one source of water, which is the primary source used by the hospital/HC? (Note: only asked if there is more than one source of water)	☐ Piped into facility ☐ Piped to facility grounds ☐ Public tap/standpipe ☐ Tube well/borehole ☐ Protected dug well ☐ Unprotected dug well ☐ Protected spring ☐ Surface water ☐ Rainwater collection ☐ Bottled water ☐ Cart w/small tank/drum ☐ Tanker truck ☐ Other ☐ Don't know ☐ No response ☐ No water source	Water Quantity & Access
B3	If the water source is not piped, how close is the nearest source of water?	☐ Water source is _____meters ☐ Don't know ☐ No response	Water Quantity & Access
B4	Are there times when [the main water source for any use] is unavailable?	☐ Yes ☐ No ☐ Don't know ☐ No response	Water Quantity & Access

	If NO, skip to B7.			
B5	If yes, why? (Read all options aloud. Check all that apply)	☐ Power outage ☐ Water rationing/shortage ☐ Equipment malfunction (i.e. broken pump) ☐ Season (dry or wet)	☐ Pipe breakage ☐ Other: ☐ Don't know ☐ No response	Water Quantity & Access
B6	How often is the main water supply interrupted?	☐ Never ☐ For part of the day, rarely ☐ For part of the day, frequently ☐ For part of the year (seasonal problem), frequently	☐ For part of the year (seasonal problem), rarely ☐ Don't know ☐ No Response	Water Quantity & Access
B7	In case water is not available from the main supply, is a backup supply available?	☐ No backup supply is available ☐ Yes, storage on site sufficient for < 1 days ☐ Yes, storage on site sufficient for 1-2 days ☐ Yes, storage on site sufficient for more than 2 days	☐ Yes, water is brought in by tanker truck as needed ☐ Other: ☐ Don't know ☐ No response	
B8	If a backup supply is available, what is the source?	☐ Piped into facility ☐ Piped to facility grounds ☐ Public tap/standpipe ☐ Tube well/borehole ☐ Protected dug well ☐ Unprotected dug well ☐ Protected spring ☐ Surface water	☐ Rainwater collection ☐ Bottled water ☐ Cart w/small tank/drum ☐ Tanker truck ☐ Other ☐ Don't know ☐ No response ☐ No water source	

B9	Does the hospital/HC ever ration water? If NO, skip to B12	☐ Yes ☐ No ☐ Don't know ☐ No response	Water Quantity & Access
B10	If yes, why?	☐ Cost of water ☐ Concerned water will run out ☐ Other: ☐ Don't know ☐ No response	Water Quantity & Access
B11	What sources of electricity are available at the hospital/HC? (Read all options aloud. Check all that apply)	☐ Municipal power ☐ Solar power ☐ Functioning generator ☐ Non-functioning generator ☐ Other: ☐ Don't know ☐ No response	Electricity
B12	If there is more than one source of electricity, which is the primary source used by the hospital/HC? (Note: only asked if there is more than one source of water)	☐ Municipal power ☐ Solar power ☐ Functioning generator ☐ Non-functioning generator ☐ Other: ☐ Don't know ☐ No response	Electricity
B13	How many days last month was the electricity from [the primary source] interrupted for more than	☐ Everyday ☐ Most days but not every day ☐ Several times ☐ Once ☐ Never ☐ Don't know ☐ No response	Electricity

	2 hours at a time?		
B14	What affects the availability and consistency of power?	☐ Equipment malfunction ☐ Seasonal weather ☐ Repairs/construction ☐ Don't know ☐ No response	Electricity
B15	Is there sufficient fuel/energy to pump water to storage tanks?	☐ Always ☐ Usually ☐ Sometimes ☐ Rarely ☐ Never ☐ Don't know ☐ No response	
B16	Where do most patients get their drinking water while at the hospital/HC? (Check all that apply)	☐ Piped into facility ☐ Piped to facility grounds ☐ Public tap/standpipe ☐ Tube well/borehole ☐ Protected dug well ☐ Unprotected dug well ☐ Protected spring ☐ Surface water ☐ Rainwater collection ☐ Bottled water ☐ Cart w/small tank/drum ☐ Tanker truck ☐ Other ☐ Don't know ☐ No response ☐ No water source	☐ Drinking Water
B17	Is water from the primary water source chlorinated? (Read all options aloud)	☐ No ☐ Yes, chlorinated before delivery to the healthcare centre ☐ Yes, chlorinated after delivery to the healthcare centre ☐ Don't know ☐ No response	
B18 b	What proportion of patients treat or boil their water while at the hospital/HC?	☐ None ☐ Less than half ☐ Half or more than half ☐ All ☐ Don't know ☐ No response	Drinking Water

B19 a	Where do the majority of the staff get their drinking water while at the hospital/HC? (Check all that apply)	☐ Piped into facility ☐ Piped to facility grounds ☐ Public tap/standpipe ☐ Tube well/borehole ☐ Protected dug well ☐ Unprotected dug well ☐ Protected spring ☐ Surface water ☐ Rainwater collection ☐ Bottled water ☐ Cart w/small tank/drum ☐ Tanker truck ☐ Other ☐ Don't know ☐ No water source	Drinking Water
B19 b	What proportion of staff treat or boil their water while at the hospital/HC?	☐ None ☐ Less than half ☐ Half or more than half ☐ All ☐ Don't know ☐ No response	Drinking Water
B20	Does the hospital do anything to treat water for drinking? If NO, skip to B23	☐ Yes ☐ No ☐ Don't know ☐ No response	DW/ Treatment
B21	If yes, how does the hospital treat drinking water?	☐ Chlorination ☐ Filtration ☐ Boiling ☐ Distillation	DW/ Treatment
B22	Are there times when treated drinking water is not available?	☐ Yes ☐ No ☐ Don't know ☐ No response	DW/ Treatment

B23	Is treated drinking water available at all times for patients?	☐ Yes ☐ No ☐ Don't know No response	DW/ Treatment
B24	Is treated drinking water available at all times for caregivers?	☐ Yes ☐ No ☐ Don't know ☐ No response	DW/ Treatment
B25	Does the hospital/HC do anything to treat water for purposes other than drinking? (such as medical uses) If NO, skip to B20	☐ Yes ☐ No ☐ Don't know ☐ No response	Treatment
B26	If yes, for what purpose and how? (Read all purposes aloud. Check all that apply and circle the type of treatment.)	☐ Surgery/cleaning wounds Chlorination Filtration Boiling Distillation Other: ☐ Sterilization/cleaning equipment Chlorination Filtration Boiling Distillation Other: ☐ Use in medical devices Chlorination Filtration Boiling Distillation Other: ☐ Dentistry Chlorination Filtration Boiling Distillation Other: ☐ Mixing medication Chlorination Filtration Boiling Distillation	Treatment

		Other: ☐ Laboratory Chlorination Filtration Boiling Distillation Other: ☐ Other: Chlorination Filtration Boiling Distillation Other: ☐ Don't know ☐ No response	
B27	Is there water distillation equipment at the hospital/HC? If NO, skip to B29.	☐ Yes ☐ No ☐ Don't know ☐ No response	Treatment
B28	If so, what is the distilled water used for?	☐ Drinking water ☐ Surgery/cleaning wounds ☐ Sterilization/cleaning medical equipment ☐ Use in medical devices ☐ Mixing medication ☐ Laboratory ☐ Dentistry ☐ Other: ☐ Don't know ☐ No response	Treatment
B29	Is the water distillation equipment functioning?	☐ Yes ☐ No ☐ Don't know ☐ No response	Treatment
B30	Do you have medical devices that require water?(examples: CPAP, incubators)	☐ Yes ☐ No ☐ Don't know ☐ No response	

	If NO, skip to B31.		
B31	If yes, where do you get the water for these machines?	☐ Piped into facility ☐ Piped to facility grounds ☐ Public tap/standpipe ☐ Tube well/borehole ☐ Protected dug well ☐ Unprotected dug well ☐ Protected spring Surface water ☐ Rainwater collection ☐ Bottled water ☐ Cart w/small tank/drum ☐ Tanker truck ☐ Other ☐ Don't know ☐ No response ☐ No water source	
B32	Do you provide soap for handwashing for staff?	☐ Yes ☐ Sometimes ☐ No ☐ Don't know ☐ No response	Hygiene
B33	Do you provide soap for handwashing for patients and caregivers?	☐ Yes ☐ Sometimes ☐ No ☐ Don't know ☐ No response	Hygiene
B34	Which of the following items used for cleaning equipment are AVAILABLE AND FUNCTIONAL at the hospital/HC today? (Read all options aloud. Check all that apply)	☐ Electric autoclave (pressure & wet heat) ☐ Non-electric autoclave ☐ Electric dry heat sterilizer ☐ Electric boiler or steamer (no pressure ☐ Non-electric pot with cover for boiling/steam ☐ Heat source for non-electric equipment ☐ Other: ☐ Don't know ☐ No response	IPC
B35	Are there functional laundry machines on	☐ Yes, there are functional washing machines ☐ No, there are no functioning laundry machines on premises	IPC

	premises?	and drying machines ☐ Yes, there are functional washing machines but not drying machines ☐ Yes, there are functional drying machines but not washing machines ☐ Don't know ☐ No response	
B36	Are beds, mattresses, pillows and/or mats cleaned between patients? (Select all that apply.)	☐ Always ☐ Sometimes ☐ Never ☐ Patients bring bedding from home ☐ Don't know ☐ No response	IPC
B37	Is infectious linen separated from used linen?	☐ Yes ☐ No ☐ Don't know ☐ No response	IPC
B38	How frequently are floors in the hospital cleaned?	☐ More than twice per day ☐ Twice per day ☐ Once per day ☐ Less than once per day ☐ Less than once per week ☐ Don't know ☐ No response	IPC
B39	What is currently used to clean the floors? (Select all that apply)	☐ Water ☐ Detergent ☐ Bleach ☐ Other: ☐ Don't know ☐ No response	IPC
B40	How frequently are the toilets for patients cleaned?	☐ More than twice per day ☐ Twice per day ☐ Once per day ☐ Less than once per day ☐ Less than once per week ☐ Don't know	IPC

		☐ No response	
B41	How frequently are the toilets for staff cleaned?	☐ More than twice per day ☐ Twice per day ☐ Once per day ☐ Less than once per day ☐ Less than once per week ☐ Don't know ☐ No response	IPC
B42	Is there an infection control committee?	☐ Yes ☐ No ☐ Don't know ☐ No response	IPC
B43	When was the last time an infection control training was carried out?	☐ In the past month ☐ In the past 6 months ☐ In the past year ☐ In the past 5 years ☐ More than 5 years ago ☐ Never ☐ Don't know ☐ No response	IPC
B44	Is infectious, non-sharps waste separated from other waste?	☐ Yes ☐ No ☐ This kind of waste is not generated ☐ Don't know ☐ No response	Healthcare Waste Disposal
B45	If yes, how do you dispose of infectious, non-sharps waste most of the time? (Read each bolded category aloud and the probe for more specific	BURN INCINERATOR ☐ 2-CHAMBER INDUSTRIAL (800-1000+° C) ☐ 1-CHAMBER DRUM/BRICK OPEN BURNING ☐ FLAT GROUND - NO PROTECTION ☐ PIT OR PROTECTED GROUND DUMP WITHOUT BURNING ☐ FLAT GROUND - NO PROTECTION ☐ COVERED PIT OR PIT LATRINE ☐ OPEN-PIT - NO PROTECTION ☐ PROTECTED GROUND OR PIT	Healthcare Waste Disposal

	location)	REMOVE OFFSITE ☐ STORED IN COVERED CONTAINER ☐ STORED IN OTHER PROTECTED ENVIRONMENT ☐ STORED UNPROTECTED OTHER ☐ Other, specify: ☐ NEVER HAS INFECTIOUS WASTE ☐ Don't know ☐ No response	
B46	Is sharps waste separated from other waste? If NO, skip to B43.	☐ Yes ☐ No ☐ This kind of waste is not generated ☐ Don't know ☐ No response	Healthcare Waste Disposal
B47	If yes, how do you dispose of sharps waste most of the time? (Read each bolded category aloud and the probe for more specific location)	BURN INCINERATOR ☐ 2-CHAMBER INDUSTRIAL (800-1000+° C) ☐ 1-CHAMBER DRUM/BRICK OPEN BURNING ☐ FLAT GROUND - NO PROTECTION ☐ PIT OR PROTECTED GROUND DUMP WITHOUT BURNING ☐ FLAT GROUND - NO PROTECTION ☐ COVERED PIT OR PIT LATRINE ☐ OPEN-PIT - NO PROTECTION ☐ PROTECTED GROUND OR PIT REMOVE OFFSITE ☐ STORED IN COVERED CONTAINER ☐ STORED IN OTHER PROTECTED ENVIRONMENT ☐ STORED UNPROTECTED OTHER ☐ Other, specify: ☐ NEVER HAS SHARPS WASTE ☐ Don't know ☐ No response	Healthcare Waste Disposal

B48	Is general waste separated from other waste? If NO, skip to B45.	☐ Yes ☐ No ☐ This kind of waste is not generated ☐ Don't know ☐ No response	Healthcare Waste Disposal
B49	If yes, how do you dispose of general waste most of the time? (Read each bolded category aloud and the probe for more specific location)	BURN INCINERATOR ☐ 2-CHAMBER INDUSTRIAL (800-1000+° C) ☐ 1-CHAMBER DRUM/BRICK OPEN BURNING ☐ FLAT GROUND - NO PROTECTION ☐ PIT OR PROTECTED GROUND DUMP WITHOUT BURNING ☐ FLAT GROUND - NO PROTECTION ☐ COVERED PIT OR PIT LATRINE ☐ OPEN-PIT - NO PROTECTION ☐ PROTECTED GROUND OR PIT REMOVE OFFSITE ☐ STORED IN COVERED CONTAINER ☐ STORED IN OTHER PROTECTED ENVIRONMENT ☐ STORED UNPROTECTED ☐ OTHER _____(SPECIFY) OTHER ☐ Other, specify: ☐ NEVER HAS GENERAL WASTE ☐ Don’t know ☐ No response	Healthcare Waste Disposal
B50	Is there a functional incinerator? If NO, skip to B48.	☐ Yes ☐ No ☐ Don't know ☐ No response	Healthcare Waste Disposal

B51	Is fuel/power for the incinerator available today?	☐ Yes ☐ No ☐ Don't know ☐ No response	
B52	How is human waste (feces) from toilets disposed of? Read all responses.	☐ Sewerage system ☐ Septic Tank ☐ Goes underground (NOT septic tank) ☐ Cesspit/field ☐ Other: ☐ Don't know ☐ No response	Wastewater Disposal
B53	If septic tank, what do you do when it is full?	☐ Has never been full ☐ Remove manually ☐ Call a waste company for removal ☐ Build a new pit ☐ Other: ☐ Don't know ☐ No response	Wastewater Disposal
B54	Does the hospital have a drainage system for managing grey water? If NO, skip to B52.	☐ Yes ☐ No ☐ Other: ☐ Don't know ☐ No response	Wastewater Disposal
B55	Does the drainage system function during heavy rain? (Read all options aloud)	☐ Yes (no visible flooding of health facility grounds) ☐ No (visible flooding of health facility grounds) ☐ Don't know ☐ No response	Waterwater Disposal

B56	Which of the following services are available at this hospital/HC? (Read all options aloud. Check all that apply)	☐ Outpatient services ☐ Antenatal care/CPN ☐ Dentistry ☐ Diabetes Treatment ☐ Eye care ☐ Family Planning ☐ HIV/VCT/ARV ☐ Inpatient ☐ Kitchen ☐ Laboratory ☐ Major surgery ☐ Maternity	☐ Minor surgery ☐ Nutrition Services ☐ Outpatient ☐ Pediatrics ☐ Pharmacy/Dispensing ☐ Post surgery ☐ TB Ward ☐ Vaccination ☐ Waiting Area ☐ Other: ☐ Don't know ☐ No response	

Structured questionnaire for Health facility in-charges/administrators

Question Type	Question/Answer Text
Label	Interview with the In-charge or Administrator
Label	– Introduce yourself to the director and explain your purpose. – Explain that the survey were done on a mobile device. – Ask for permission to interview and then visit the wards and toilets to observe and take samples.
Select Multiple	Which of the following services or departments are available at this healthcare facility?
	Antenatal Care
	Dentistry
	Emergency Department
	Environmental Services
	Eye Clinic
	Family Planning
	HIV/VCT/ARV Clinic
	Housing for Staff
	Immunization
	Inpatient
	Intensive Care Unit
	Kitchen
	Labor and Delivery

	Laboratory
	Major Surgery
	Morgue
	Minor Surgery
	Nutrition Services
	Outpatient
	Pediatric
	Pharmacy
	Postnatal
	TB Services
	Other
Free Text	Specify other:
Label	Electricity
Select Multiple	What sources of electricity are used at the healthcare facility?
	Utility power
	Solar power
	Generator (petroleum)
	Firewood
	Charcoal
	LPG
	No power source

	Other
	Don't know
	If there is more than one source of electricity, which is the main source used by the healthcare facility?
	Utility power
	Solar power
	Generator (petroleum)
	Firewood
	Charcoal
	LPG
	No power source
	Other
	Don't know
Select One	If electricity (utility, solar, generator) is used to power the facility, how many days last month was the electricity from [the main source] interrupted for more than 2 hours at a time?
	Everyday
	Most days but not every day
	Several times
	Once
	Never
	Don't know

Label	Water Supply
Select Multiple	Please tell me which of the following sources of water are available to the healthcare facility:
	Piped supply from outside the facility
	Tube well
	Borehole
	Protected dug well
	Rain water
	Unprotected dug well
	Surface water
	Tanker truck
	Other
	Don't know
	No water source
Free Text	Specify other:
Select One	What is the main water source for the healthcare facility?
	Piped supply from outside the facility
	Tube well
	Borehole
	Protected dug well
	Protected spring
	Rain Water

	Unprotected dug well
	Surface water
	Tanker truck
	Other
	Don't know
	No water source
Free Text	Specify other:
Select One	Where is the main water source for the facility?
	On premises
	Off premises, within 500m
	Off premises, farther than 500m
	No water source
	Don't know
Integer	What is the round trip travel time to collect water off premises?
Select Multiple	Who collects the water off premises?
	Patients/caregivers only
	Staff only
	Both patients/caregivers and staff
	Other
	Don't know
Select One	Are there times when the main water source is unavailable?

	Yes
	No
	Don't know
Select Multiple	Why are there times when the main water source is unavailable?
	Power outage
	Water rationing/shortage
	Equipment malfunction (i.e. broken pump)
	Season (dry or wet)
	Pipe breakage
	Problems at the water provider
	Other:
	Don't know
Free Text	Specify other:
Select One	How often is the main water supply unavailable?
	For part of the day, rarely
	For part of the day, frequently
	For part of the year (seasonal problem), frequently
	For part of the year (seasonal problem), rarely
	Don't know
Select One	Is there routinely a time of year when the healthcare facility has severe shortage or lack of water?

	Yes
	No
	Don't know
Select One	Does the healthcare facility ever ration water?
	Yes
	No
	Don't know
Select Multiple	Why does the healthcare facility ration water?
	Cost of water
	Concerned water will run out
	Other
	Don't know
Free Text	Specify other:
Select Multiple	How does the healthcare facility store water?
	In centralized storage tank (s) (plastic/concrete/steel)
	In storage tanks (plastic/concrete/steel) at the various wards
	In containers (such as buckets/jerry cans) inside the wards
	In containers on facility premises
	Other
	No water storage available

	Don't know
Free Text	Specify other:
Select Multiple	What type of water storage facilities are available?
	Plastic tanks
	Concrete tanks
	Elevated steel tanks
	Buckets/jerrycans within wards
	Other
	Don't know
Free Text	Specify other:
Integer	What is the total water storage capacity at the healthcare facility in liters?
Select One	Can this storage capacity provide at least 24 hours of water supply to meet the needs of this healthcare facility?
	Yes
	No
	Don't know
Select Multiple	Which users have access to water?
	Patients/Caregivers
	Staff
	Community Members

	None
	Don't know
Select One	Is water accessible to all users at all times?
	Yes
	No, patients/caregivers do not have access at times
	No, staff do not have access at times
	No, both staff and patients/caregivers do not have access at times
	Don't know
Select One	Are there tastes, odors or colors that discourage consumption or use of the drinking-water?
	Yes
	Sometimes
	No
	Don't know
Select Multiple	How is water accessed within the healthcare facility?
	Piped taps
	Uncovered buckets/barrels
	Covered buckets/barrels
	Covered buckets with taps on bottom
	Uncovered buckets with taps on bottom
	Jerrycans

	Other
	Don't know
Free Text	Specify other:
Select Multiple	How is water removed from buckets/barrels for use in the wards?
	Cup or ladle
	Tap
	Pour
	Other
	Don't know
Free Text	Specify other:
Select One	Does this healthcare facility expect that pregnant women will bring their own water when they come to deliver?
	Yes
	Sometimes
	No
	Don't know
Label	Water Treatment
Select One	Is water from the main water source chlorinated (treated with chlorine)?
	Yes
	No
	Don't know

Select One	Does chlorination occur on the healthcare facility premises?
	Yes
	No
	Don't know
Select One	Does the healthcare facility purchase or produce drinking-quality water for staff, patients and caregivers?
	Yes
	No
	Don't know
Select Multiple	How does the healthcare facility provide treated drinking-water?
	Chlorination of drinking-water onsite
	Filtration of drinking-water onsite
	Boiling of drinking-water onsite
	UV treatment of drinking-water onsite
	Bottled (or sachet) drinking-water available
	Drinking-water is treated before reaching the healthcare facility (i.e. by a utility treatment plant)
	Other:
	Don't know
Free Text	Specify other:
Select One	In the previous two weeks, was drinking-water available for patients throughout each day?

	Yes
	No
	Don't know
Label	Water treatment for medical purposes
Select Multiple	How is water treated for surgical procedures?
	Chlorination
	Filtration
	Boiling
	Distillation
	Purchase
	UV
	Other
	No treatment
	Not applicable
	Don't know
Select Multiple	How is water treated for labor and delivery?
	Chlorination
	Filtration
	Boiling
	Distillation

	Purchase
	UV
	Other
	No treatment
	Not applicable
	Don't know
Select Multiple	How is water treated for wound and burn care?
	Chlorination
	Filtration
	Boiling
	Distillation
	Purchase
	UV
	Other
	No treatment
	Not applicable
	Don't know
Select Multiple	How is water treated for the processing of medical equipment?
	Chlorination
	Filtration

	Boiling
	Distillation
	Purchase
	UV
	Other
	No treatment
	Not applicable
	Don't know
Select Multiple	How is water treated for use in medical devices?
	Chlorination
	Filtration
	Boiling
	Distillation
	Purchase
	UV
	Other
	No treatment
	Not applicable
	Don't know
Select Multiple	How is water treated for dentistry?

	Chlorination
	Filtration
	Boiling
	Distillation
	Purchase
	UV
	Other
	No treatment
	Not applicable
	Don't know
Select Multiple	How is water treated for mixing medication?
	Chlorination
	Filtration
	Boiling
	Distillation
	Purchase
	UV
	Other
	No treatment
	Not applicable
	Don't know

Select Multiple	How is water treated for use in the laboratory?
	Chlorination
	Filtration
	Boiling
	Distillation
	Purchase
	UV
	Other
	No treatment
	Not applicable
	Don't know
Label	Hygiene
Select One	Does the healthcare facility provide the staff with soap for handwashing?
	Yes
	Sometimes
	No
	Don't know
Select One	Does the healthcare facility provide patients and caregivers with soap for handwashing?
	Yes
	Sometimes

	No
	Don't know
Select One	Are bathing facilities available to patients?
	Yes
	No and have inpatient services
	No but do no have inpatient services
	Don't know
Select One	Are beds, mattresses, pillows and/or mats cleaned between patients?
	Always
	Sometimes
	Rarely or never
	Bedding is not provided by healthcare facility (patients bring their own)
	No inpatient services
	Don't know
	Are the healthcare facility floors, surfaces and toilets cleaned whenever soiled, at least once a day, with water and detergent?
	Yes, cleaned every day with water and detergent
	Cleaned with water and detergent, but less than once a day
	No
	Don't know
	Are functional laundry facilities available to wash linens and medical scrubs?
	Yes

	No
	Don't know
Select Multiple	What functional sterilization equipment is available at the healthcare facility today?
	Autoclave (pressure & wet heat)
	Dry heat sterilizer
	Boiler or steamer (no pressure - electric or not)
	Other
	No functional sterilization equipment available
	Don't know
Free Text	Specify other:
Label	Sanitation
Select One	Are toilet facilities available on the healthcare facility premises?
	Yes
	No
	Don't know
Select One	Are there sufficient toilet facilities to meet the healthcare facility's needs?
	Yes
	No
	Don't know
Select One	How is human waste (feces) from toilets disposed of most of the time?
	Sewerage system

	Septic Tank
	Pit/chamber
	Discharged into drain or immediate environment
	Other
	Don't know
Free Text	Specify other:
Select One	How is the septic tank or underground holding pit emptied most of the time?
	Manually remove waste
	Call a waste company for removal
	Build a new pit
	Other
	Has never been full
	Don't know
Free Text	Specify other:
Label	Waste Management
Select One	Are fenced and protected areas available for the storage of waste awaiting disposal or removal?
	Yes
	Sometimes
	No
	Don't know
Select One	Is there a functional incinerator with fuel available?

	Yes, and fuel is available today
	Yes, but no fuel is available today
	No
	Don't know
Select One	Is infectious waste separated from other waste in the ward?
	Yes
	Sometimes
	No
	This kind of waste is not generated
	Don't know
Select One	How is infectious waste treated most of the time?
	Autoclave
	Chemical disinfection with hypochlorite (ex: chlorine, bleach, etc.)
	Other
	Not treated
	Don’t know
Free Text	Specify other:
Select One	How is infectious waste disposed most of the time?
	Incinerate (two chamber, 850-1000 C)
	Incinerate (brick incinerator)

	Bury in a lined, protected pit
	Bury in an unprotected pit
	Open burning
	Open dumping
	Collected for medical waste disposal
	Other
	Don't know
Free Text	Specify other:
Select One	Is sharps waste separated from other waste in the ward?
	Yes
	Sometimes
	No
	This kind of waste is not generated
	Don't know
Select One	How is sharps waste treated most of the time?
	Autoclave
	Chemical disinfection with hypochlorite (ex: chlorine, bleach, etc.)
	Other
	Not treated
	Don't know
Free Text	Specify other:

Select One	How is sharps waste disposed most of the time?
	Incinerate (two chamber, 850-100 C)
	Incinerate (brick incinerator)
	Bury in a lined, protected pit
	Bury in unprotected pit
	Open burning
	Open dumping
	Collected for medical waste disposal
	Other
	Don't know
Free Text	Specify other:
Select One	How is non-infectious general waste disposed most of the time?
	Incinerate (two chamber, 850-100 C)
	Incinerate (brick incinerator)
	Bury in a lined, protected pit
	Bury in unprotected pit
	Open burning
	Open dumping
	Other
	Don't know
Free Text	Specify other:
Select One	Are placentas separated from other waste?

	Yes
	Sometimes
	No
	This kind of waste is not generated
	Don't know
Select One	How are placentas disposed most of the time?
	Incinerate (two chamber, 850-100 C)
	Incinerate (brick incinerator)
	Bury in a lined, protected pit
	Bury in unprotected pit
	Open burning
	Open dumping
	Women bring placentas home
	Collected for medical waste disposal
	Other
	Don't know
Free Text	Specify other:

Administrative and management questions

Question	Question/Answer Text

Type	
label	Administrative Data
Select One	Does this healthcare facility have outpatient services?
	Yes
	No
Integer	On average, how many outpatients are seen per month?
Integer	How many days in a month are outpatients seen?
Select One	Does this healthcare facility have inpatient services?
	Yes
	No
Integer	On average, how many inpatients are seen per month?
Integer	On an average day, how many inpatients are at the healthcare facility?
Integer	How many inpatient beds are available?
Integer	On average, how many deliveries take place per month?
Integer	Of these deliveries, how many were cesarean sections?
Select One	Are surgical procedures performed at this healthcare facility?
	Yes
	No
Integer	On average, how many surgical procedures are performed per month?

Integer	How many clinical staff are employed at the healthcare facility?
Integer	Of the clinical staff, how many are medical doctors?
Integer	How many non-clinical staff are employed at the healthcare facility?
Integer	Of the non-clinical staff, how many are cleaners?
Integer	On average, how much water is used daily (in liters)?
Management Questions	
Question Type	Question/Answer Text
Select One	Are there written guidelines pertaining to water, sanitation, and hygiene for the healthcare facility?
	Yes
	No
Select One	Are there written policies and protocols available within the facility relating to cleaning the delivery room?
	Yes
	No
Select One	Are there written policies and protocols available within the facility relating to cleaning in-patient rooms (non-surgical)?
	Yes
	No
Select One	Is there a water, sanitation, and hygiene improvement plan in place for the healthcare facility?
	Yes

	No
Select One	If yes, is the improvement plan implemented and regularly monitored?
	Yes
	No
Select One	Do you have an annual planned budget for the healthcare facility that includes funding for WASH infrastructure (sinks, toilets, etc.), services (pit emptying), personnel and the continuous procurement of WASH items (hand soap, chlorine/bleach, etc.)?
	Yes
	No
Select One	Do you have a budget for the maintenance of the healthcare waste incinerator (if it applies)?
	Yes
	No
	No incinerator
Select One	Are regular audits of each ward undertaken to assess the availability of hand sanitizer, soap, single use towels and other hand hygiene resources?
	Yes
	No
Select One	Is there a mechanism to track the supply of IPC-related materials (such as hand sanitizer, gloves and protective equipment)
	Yes
	No
Select	Is there an up-to-date diagram of the facility management structure clearly visible and

One	legible?
	Yes
	No
Select One	Are there adequate cleaners and maintenance staff available at this healthcare facility?
	Yes
	No
Select One	Are the activities related to ensuring the daily availability and function of water, sanitation and hygiene infrastructure (sinks, toilets, etc.) shared across more than one staff person?
	Yes
	No
Integer	If yes, how many staff are involved with ensuring there is available and functional WASH infrastructure?
Select One	Is there a focal person(s) who is responsible for managing the daily availability and function of water, sanitation and hygiene infrastructure for the healthcare facility (e.g., sinks, toilets, handwashing stations, etc.)?
	Yes
	No
Free Text	If yes, what is the job title of that person?
Select One	Is there a focal person(s) who is responsible for managing water, sanitation and hygiene resources for the healthcare facility (e.g., soap, chlorine, disinfectant, etc.)?
	Yes

	No
Free Text	If yes, what is the job title of that person?
Select One	Is there a dedicated staff responsible for the operation and maintenance of the incinerator?
	Yes
	No
Select One	Does the healthcare facility have a dedicated infection control focal person or committee?
	Yes
	No
Select One	Do all staff have a job description written clearly and legibly, including cleaners?
	Yes
	No
Select One	Are the staff regularly appraised on their performance?
	Yes
	No
Select One	Are high performing staff recognized and rewarded, while staff that do not perform well dealt with accordingly?
	Yes
	No
Select	Do you communicate with the maintenance staff frequently enough so that you are

One	always aware of important WASH issues at the facility?
	Yes
	No
Select One	Do new healthcare personnel receive infection prevention and control (IPC) training as part of their orientation program?
	Yes
	No
Select One	Do new cleaners and maintenance personnel receive infection prevention and control (IPC) training as part of their orientation?
	Yes
	No
Select One	Are healthcare personnel trained on infection prevention and control (IPC) every year?
	Yes
	No
Select One	Has any staff been trained on WASH issues in healthcare facilities?
	Yes
	No
Select One	Have staff responsible for cleaning the delivery room received training in the last 24 months?
	Yes
	No

Select One	Have all healthcare staff (including cleaners) received training on sorting, storage and elimination of healthcare waste (e.g. used needles, bandages, tubes) in the last 24 months?
	Yes
	No
Select One	When you bring up issues regarding water access and supply, how often are the maintenance staff able to resolve those issues?
	Always
	Sometimes
	Rarely
	Never
Select One	When the maintenance staff bring up issues regarding water access and supply, how often are you able to resolve those issues?
	Always
	Sometimes
	Rarely
	Never
Select One	In the past two years, has anyone tested and/or monitored the water quality within the facility?
	Yes
	No
Select One	In the last year, have you assigned or contracted someone to complete tasks related to the maintenance and repair of your water source and/or distribution system?

	Yes
	No
Select One	In the last year, has there been a time when you needed new sinks, taps or pipes but could not buy them?
	Yes
	No
Select Multiple	What was the main reason?
	Insufficient funds
	No supply chain/part unavailable
	Other
Free Text	Specify other:
	Who mainly pays for WASH-related operation and maintenance costs for this healthcare facility?
	Government (national or district)
	Non-profit (NGO, foundation, church)
	Facility Revenue
	Other:
	No budget for WASH-related operation and maintenance
	Don't know
Label	"I am now going to read you a few statements. Please respond with either true or false."

Select One	The cleaning staff is an important part of infection prevention and control at the healthcare facility.
	True
	False
Select One	Making sure that there is sufficient funding for the supplies associated with WASH is my responsibility.
	True
	False
Select One	I am ultimately responsible for the sustainability of the WASH infrastructure, conditions, and behaviors at this facility.
	True
	False
Select One	Spending time learning about WASH is a good use of my time as a director/manager.
	True
	False
Select One	I consider water, sanitation and hygiene within the facility to be a top 10 priority issue.
	True
	False
Select One	It is my responsibility to ensure that staff at the hospital are educated about IPC and WASH.
	True

	False
Select One	WASH/IPC training should be mandatory for everyone working in a healthcare facility, including cleaners and cooks.
	True
	False
Select One	Quality of care for patients includes a clean hospital environment.
	True
	False
Select One	Overseeing the maintenance of WASH infrastructure, including preventative maintenance and repairs, is my responsibility.
	True
	False
Free Text	What are the most important WASH issues that should be addressed at this healthcare facility?

Ward Observation checklist

Question Type	Question/Answer Text
Select One	Which ward are you observing?
	Labor and Delivery Ward
	Postnatal Ward
	Surgery Ward
	Pediatric Ward
	Inpatient Ward
	Outpatient Ward
	Emergency Ward
	Kitchen
	Other
Free Text	Specify other:
Select one	Is water piped into this ward?
	Yes
	Yes, but currently unavailable
	No
	Didn't observe
	What type of water is currently available in this ward?
	Treated water

	Untreated water
	Treated and untreated water
	No water available
	Didn't observe
Select Multiple	How is water accessed in the ward?
	Piped taps
	Uncovered buckets/barrels
	Covered buckets/barrels
	Uncovered buckets with tap on bottom
	Covered buckets with tap on bottom
	Jerrycans
	Other
	Didn't observe
Free Text	Specify other:
Select One	Who has access to water in this ward?
	Staff
	Patients/caregivers
	Both staff and patients/caregivers
	Neither staff nor patients/caregivers
	Didn't observe
Select One	Is water stored in the ward?

	Yes
	No water storage for the ward, but storage is available for whole healthcare facility
	No water storage available at all at this healthcare facility
	Didn't observe
Select Multiple	How is water stored in the ward?
	Storage tank
	Covered container
	Uncovered container
	Jerrycan
	Other
	Didn't observe
Free Text	Specify other:
Select One	Is there at least 100L of stored water available
	Yes
	No
	Didn't observe
Select One	Observe a functional hand hygiene facility at the point of care and select the available hand hygiene materials.
	Water only
	Soap only
	Hand sanitizer only

	Water and soap
	Water and sanitizer
	Soap and sanitizer
	Water, soap and sanitizer
	No supplies available
	Didn't observe
Select Multiple	Observe a functional hand hygiene facility accessible to patients/caregivers and select the available hand hygiene materials.
	Water only
	Soap only
	Hand sanitizer only
	Water and soap
	Water and sanitizer
	Soap and sanitizer
	Water, soap and sanitizer
	No supplies available
	Didn't observe
Select Multiple	Observe if the following resources/supplies used for infection control are available today in the ward:
	Disposable latex gloves
	Environmental disinfectant (chlorine, ethanol, alcohol)
	Hand sanitizer

	Soap/detergent
	Mop and bucket
	Broom
	No supplies available
	Didn't observe
Select Multiple	Observe if the following resources/supplies used for infection control are available today in the ward:
	Disposable latex gloves
	Environmental disinfectant (chlorine, ethanol, alcohol)
	Hand sanitizer
	Soap
	Mop and bucket
	Broom
	Clean blade for cord cutting
	Clean cord for tying
	Clean towels to wrap baby and mother
	Clean delivery surface
	No supplies available
	Didn't observe
Select One	Is chlorhexidine available for the treatment of umilical cords?
	Yes
	No

	Didn't observe
Select One	Is waste safely segregated into at least three labeled bins, including sharps waste, infectious waste and non-infectious general waste?
	Yes
	Bins are present but do not meet all requirements
	No
	Didn't observe
Select One	Are there functional needle cutters/hub cutters available next to the sharps bin?
	Yes
	No
	Didn't observe
Select One	Is the ward visibly clean and free from dust and soil?
	Yes
	No
	Didn't observe
Select One	Are there uncleaned spills from bodily fluids (blood, urine, feces, vomit, etc.)?
	Yes
	No
	Didn't observe
Select one	Are the floors clean?
	Yes
	No

	Didn't observe
Select One	Are there hand hygiene promotion materials clearly visible and understandable at key places within the ward?
	Yes
	No
	Didn't observe
Select One	Is there a toilet block for patients within 30m of this ward?
	Yes
	Toilet available, but non-functional
	No
	Don't know
Select One	Is there a bathing shelter available to patients?
	Yes
	Yes, but not hygienic or non-functional
	No
	Don't know

Toilet Observation Guide

Label	TOILET FACILITY OBSERVATIONS
Select One	Is the facility locked from the outside?
	No
	Yes and staff unlocked for observation
	Yes, but staff did not unlock for observation
Select Multiple	What areas/wards does this toilet block primarily serve?
	Outpatient Ward
	Inpatient Ward
	Labor and Delivery Ward
	Administrative Services (and other non-patient care services)
	Other
	Didn't observe
Free Text	Please specify other:
Select One	Who uses this toilet block?
	Staff
	Patients/caregivers
	Both staff and patients/caregivers
	Both staff and patients/caregivers, but separated

	Didn't observe
Select One	What gender has access to this toilet block?
	Male
	Female
	Both male and female (unseparated)
	Both male and female, but separated
	Didn't observe
Select One	From what material is the slab made?
	Sticks/wood
	Concrete
	Plastic
	No slab
	Didn't observe
Select One	Are there any cracks in the slab?
	Yes
	No
	Didn't observe
Select Multiple	What type of toilet(s) can be found in this block?
	Pit latrine without slab
	Bucket latrine
	Pit latrine with slab

	Ventilated Improved Pit (VIP) Latrine
	Flush
	Pour-flush
	Other improved
	Other unimproved
Integer	How many usable improved toilets can be found in this toilet block?
Select One	How many usable improved toilets have doors?
	All
	Some
	None
	Didn't observe
Integer	How many usable improved toilets are available to patients?
Integer	How many usable improved toilets are designated for staff?
Integer	How many non-usable toilets can be found in this toilet block?
Select One	Do the toilet blocks have adequate light, including at night?
	Yes
	No
	Didn't observe
Select One	How many usable improved toilets have flies?
	All
	Some
	None

	Didn't observe
Select One	Is there an unpleasant smell (of urine or feces) on the block?
	Yes
	No
	Didn't observe
Select One	Is the toilet block visibly clean, with no presence of feces, blood or bodily substances?
	Yes
	No
	Didn't observe
	Is the toilet pit blocked?
	Yes
	No
	Didn't observe
	Are there major holes in the walls?
	Yes
	No
	Didn't observe
Select One	Observe a functioning hand hygiene facility within 5 meters of the toilet block and select the available hand hygiene materials.
	Water only
	Soap only

	Water and soap
	No supplies available
	Didn't observe
Select One	Observe a functional hand hygiene facility accessible to people with reduced mobility within 5 meters of the toilet block and select the available hand hygiene materials.
	Water only
	Soap only
	Water and soap
	No supplies available that could be accessed by with reduced mobility
	Didn't observe
Select One	Is there at least one usable improved toilet designated for women and girls, which provides facilities to manage menstrual hygiene needs?
	Yes
	No
	Didn't observe
Select One	Is there at least one usable improved toilet that meets the needs of people with reduced mobility?
	Yes
	No
	Didn't observe

Appendix 7: General Sanitary inspection guide for water sources

Question	Question/Answer Text

Type	
Select One	Is water available from the main source at the time of the survey?
	Yes
	No
	Didn't observe
Select One	Is an alternative water source available?
	Yes, and the alternative source is improved.
	Yes, but the alternative source is unimproved.
	Have alternative source but is unavailable
	No alternative water source
	Don't know
Select One	Is there at least one drinking water point available to staff, patients and caregivers on the healthcare facility's premises?
	Yes
	No
	Didn't observe
Select One	Is there at least one drinking water point available to staff, patients and caregivers on the healthcare facility's premises available to people with reduced mobility?
	Yes
	No
	Didn't observe
Select One	Is open defecation practiced at this healthcare facility?

	Yes
	No
	Didn't observe
Select One	Are feces from babies uncontained?
	Yes
	No
	Didn't observe
Select One	Is there uncontained solid waste on facility premises?
	Yes
	No
	Didn't observe
Free Text	Please describe any other notable conditions of the facility:

Key informant interviews with Janitorial staff

Key Questions: Infection Control Practices/Janitorial Practice

1. What types of hygiene practices are available for the cleaning staff?
Probe: hand soap, cleaning products

2. Walk me through the details on how the hospital rooms are cleaned.
Probe: how often, details on how bathrooms and toilets are cleaned

3. What wards/rooms do you clean daily at the HCF?
4. What are infection control practices?
5. Have you ever attended a training on infection control practices? (*if no, skip questions 4 and 5)*
6. How do you feel about the infection protocol trainings?
7. What do the trainings teach about infection control protocols?

Key Questions: Availability and Cleanliness of Water

8. What is your primary source of water at the healthcare facility?
Probe: source of drinking water for staff and patients?

9. What are some restrictions on the availability or cleanliness of water at the healthcare facility?
Probe: main water break, rationing of water, limited resources

10. What do you do when there is no available clean water?
Probe: round trip travel time in minutes to collect water off premises

Key Questions: Availability of Electricity (Power Source)

11. What is the primary source of electricity?
12. How often is the primary source of electricity unavailable?
13. What have you noticed affects the availability and consistency of power?
14. What happens when the main power supply is interrupted for extended periods of time?
Probe: time when protocol was not followed

Key Questions: Waste Disposal

15. How is waste disposed of at this HCF?
Probe: general vs infectious vs sharp

16. What happens when the system in place for waste disposal is not functioning?
17. How are human feces disposed of at the HCF?
18. What effects waste disposal methods?
Probe: seasonal patterns

Closing Questions:

What do you think is the biggest issue regarding WASH services at this HCF?

Thank you so much for taking the time to complete this interview.

Patient Exit interviews

STUDY TITLE: BASELINE SURVEY ON WASH IN HEALTH CARE FACIITIES IN UGANDA– PATIENT EXIT INTERVIEW

DATE OF INTERVIEW: _____/_____/_____ [DD/MM/YYYY]
R/ASST NAME: _____
FIELD SUPERVISOR NAME: _____
INTERVIEW START TIME: _____ [HRS]_____[MIN]

HCF LOCATION INFORMATION	
DISTRICT 4. Kampala 5. Wakiso 6. Mukono	Type of Area: 3. Urban 4. Rural
Facility Type: 4. Hospital 5. HC IV 6. HC III	Type of Ownership: 3. Public 4. Private Not for Profit

INFORMATION TO PARTICIPANTS (CONSENT FORM)

[Respondent must be a woman who has been at the respective facility for at least 2 hours. Interviewers should spend a few minutes building rapport with the respondent.]
My name is _____ and I am working on behalf of Makerere University School of Public health and Water Aid Uganda. We are gathering information about access, coverage and affordability of WASH services at health facilities in your area, including the impact of available WASH services on provision of care to delivering mothers and their new-born babies.
You have been selected to participate in this survey because you expect treatment and we would like to hear your experiences of the water and sanitation services available to this facility.
The interview will take about 20 to 30 minutes. All of the answers you give were confidential and will not be shared with anyone other than members of our survey team.

You don't have to be part of this assessment if you don't want to, but we hope you will agree to answer the questions since your contribution is very important to us. The outcome of this survey will serve as a basis to evaluation of the situation before and after implementation of the WASH in health facilities project. If you agree to participate, you can ask me to explain anything you don't understand at any time during our conversation, and you are free to end the conversation at any time. If I ask you any question you don't want to answer, just let me know and I will go on to the next question.
Do you have any questions?
May I begin the interview now?
SIGNATURE OF INTERVIEWER: _____ DATE: _____/_____/_____ [DD/MM/YYYY]

RESPONDENT AGREES TO BE INTERVIEWED……1
[GO TO PART 1]

RESPONDENT DOES NOT AGREE TO BE INTERVIEWED……..……2 [**END THE INTERVIEW**]

PART 1 – RESPONDENT INFORMATION

NO.	QUESTIONS& INSTRUCTIONS	RESPONSES	CODES	SKIPS
1.	Respondent's age	Age in complete years	|____|____|	
2.	Respondent sex	Male Female	1 2	
3.	Location of respondent recruitment	Out-patient department (OPD) In-patient department (IPD) Delivery/maternity area	1 2 3	
4. 3.	Respondent's highest level of education completed. [Please mark only 1 response]	No formal education Some primary education Completed primary education Secondary O-Level Secondary A-Level Post-secondary Level University Other (specify)	1 2 3 4 5 6 7 96	
5. 4.	For how long have the respondent been at the facility? [Please mark only 1 applicable response]	Hours Days	|____|____| |____|____|	

PART 2 – HEALTH EDUCATION ON WASH

6. 6.	Since you arrived at this facility, have you heard of any information on how to prevent yourself or your baby with contaminations and diseases?	Yes No	1 0	If no, SKIP to no. 8
7.	Can you share with me some of the information that you have heard?			
8.	From which source(s) did you hear such information?			
9.	Since arriving at this facility	Yes	1	

NO.	QUESTIONS& INSTRUCTIONS	RESPONSES	CODES		SKIPS
	have you seen any posters or (IEC materials) which are educating on personal hygiene, water safety and environment sanitation posted on open space wall in this facility?	No	0		
10.	If Yes, mention the key three issues which you ever read from these IEC materials, concerning to Water, sanitation and hygiene?	 Hand washing Treatment of drinking water Behaviours of good hygiene Environment cleanliness Other (specify)_____ _____	Yes 1 1 1 1 96	No 0 0 0 0 0	

PART 3 – WATER

11.	What is the commonly used source of water for patients' use at this facility? [More than one option is allowed]	Piped water Piped into the facility rooms Piped into facility yard/plot Public tap Water from well Open/unprotected facility-owned well Open/unprotected public well Protected facility-owned well Protected public well Borehole Borehole at facility yard/plot Surface water River/stream Pond/lake Dam Spring Rain water Water brought in tanker trucks or container No water sources 0ther (specify)	 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 96	
12.	What is your opinion on the quality of water that patients at this facility are drinking? [circle relevant]	Safe …… ……. Unsafe…… …… Don't know	1 2 98	

NO.	QUESTIONS& INSTRUCTIONS	RESPONSES	CODES	SKIPS
13.	Why would you think water at this facility is safe/unsafe?			Ask if Q11=1 or 2
14.	What is the source of water for hand washing for patients at this facility?	Sink connected to a tap Bucket connected to a tap Standing water in a bucket Other (specify)_____	1 2 3 96	
15.	[Only for respondents from the maternity/labour ward] What is the source of water for bathing among women admitted in the maternity & labour ward?	Running water from the shower Water in containers obtained from a tap inside the bathing area Water in containers brought from an outside source Other (specify)	1 2 3 96	

PART 4 – SANITATION

16.	Since you have arrived at this facility, have you used a toilet?	Yes No	1 0		
17.	If No, can you explain the reason why you did not access the toilet service when you were in this facility?	Did not have a need No toilet here Toilet is dirty No water in the toilet Less interested to use public toilets Other (specify)	1 2 3 96		
18.	In your opinion, what do you think about the number of drop holes toilets/latrines for patients at this facility?	Very few Few Enough More than enough Don't know	1 2 3 4 98		
19.	In your opinion, what do you think about the cleanliness of toilets/latrines in the delivery and maternity area?	Clean Dirty Don't know	1 2 98		
20.	Are you satisfied with water availability in toilet facilities?	Yes No	1 0		SKP to Q22 if Yes
21.	In your opinions, what do you think could be done better?				
22.	On your views, do you think the available toilets at this facility are suitable for use by the following?	Under five years Children Pregnant women People with special	Yes 1 1	No 0 0 0	

NO.	QUESTIONS& INSTRUCTIONS	RESPONSES	CODES		SKIPS
		requirements (e.g. Disadvantaged persons) Elderly	1 1	0 0	

PART 4 – HAND WASHING & PERSONAL HYGIENE

23.	What are the critical times that you usually wash your hands? Do not read the responses! [Multiple answers allowed]	 After using the toilet Before preparing your food Before feeding /breastfeeding the baby Before and after taking meal After anal cleansing to a baby After touching dirty materials	Yes 1 1 1 1 1 1	N 0 0 0 0 0 0	
24.	Did you ever wished to wash your hands while at this facility but failed to?	Yes No	1 0		SKP to 26 if No
25.	If Yes, mention the reason which limited you to wash your hands while in this facility? Do not read the responses! [Multiple answers allowed]	 Inadequate/lack of water Inadequate/lack of soap Other (specify)	Yes 1 1 1 96	No 0 0 0	
26.	Are there any challenges related to women taking a bath here at this facility? If yes, what are they?				
27.	If you can recall, how often did the person who examined you washed their hands before starting the examination?	Always Sometimes Never Don't know	1 2 3 98		

INTERVIEW END TIME: _____ [HRS]_____[MIN]

Patient Exit interviews (Luganda version)

STUDY TITLE: BASELINE SURVEY ON WASH IN HEALTH CARE FACIITIES IN UGANDA– PATIENT EXIT INTERVIEW

DATE OF INTERVIEW: _____/_____/_____ [DD/MM/YYYY] R/ASST NAME: _____ **FIELD SUPERVISOR NAME**: _____ **INTERVIEW START TIME**: _____ [HRS]_____[MIN]

HCF LOCATION INFORMATION	
DISITULIKITI 7. Kampala 8. Wakiso 9. Mukono	EKIFO: 5. KIBUGA 6. KYALO
Ekikka ky'ekifo ekijjanjabibwamu: 7. Dwaliro ddene 8. HC IV 9. HC III	Type of Ownership: 5. Dwaliro ly'alukale 6. Dwaliro ly'abwanannyini eritakola magoba

INFORMATION TO PARTICIPANTS (CONSENT FORM)
Amannya nze…..era nkola ne Makerere University School of Public Health n'ekitongole ekya Water Aid Uganda. Tuli mukunonyereza ku mazi n'ebyobuyonjo mu malwaliro mukitundu kyo, n'okugatako engeri empereza z'amazzi n'ebyobuyonjo we zirikosa/ kutumbula endabirira y'abakyala abaze okuzaala awamu n'abaana baabwe. Olondedwa okwetaba mukunonyereza kuno kubanga osuubira obujjanjabi era tusaba okutubulirako byoyisemu eby'ekuusa ku by'amazi n'ebyobuyonjo. Ebibuuzo bijakutwala edakiika eziri wakati wa 20 na 30. Byonna by'onoddamu bijjakutwalibwa nga bya kyama era tewali ajja kubitegera okujjako ffeffeka abali mukunonyereza kuno.

Okwetaba mukunonyereza kuno kwakyeyagalire, naye tusaba wetabe mukudamu ebibuuzo bino. Ebinaava mukunonyereza kuno bijja kutuyamba okutegera embeera bweli nga tetunaba kuleeta mpereza n'ebweneba nga tumazze okulongoosa empereza. Bwoba okiriza okwetaba mukunonyereza kuno osobola okumbuuza ekintu kyona kyotategede ate era oli waddembe okulekelawo okuddamu ebibuuzo bw'oba oyagadde. Bwemba nkubuuziza ekibuuzo kyotayagala kuddamu, Nsaba ombulirire nsobole okubuuza ekirala.
Oyina yo ekibuuzo kyonna?
May I begin the interview now?
OMUKONO/ EKINKUMU: _____ DATE: _____/_____/_____ [DD/MM/YYYY]

OMUNTU AKIRIZA ……1 **[GO TO PART 1]**
RESPONDENT DOES NOT AGREE TO BE INTERVIEWED……..……2 [**END THE INTERVIEW**]

PART 1 – RESPONDENT INFORMATION

NO.	EBIBUUZO N'ENDAGIRIRO	EBIDIBWAMU	KOODI	OKUBUUKA
28. 2.	Emyaka	Emyaka emijuvu	|____| ____|	
29.	Ekikkula	Musaja Mukyala	1 2	
30.	Omulwadde wasangidwa	Abalwadde we batuukira (OPD) Abalwadde we baweerwa ebitanda (IPD) Abalwadde webazaalira	1 2 3	
31. 3.	Wasoma kutuuka ku ddaala ki? [Please mark only 1 response]	Saasomerako ddala Yasoma ko mu pulayimale Yamala pulayimale Yamala siniya (eddala erya O) Yamala haaya Yasoma okusuka haaya Yatuuka ku yunivasite Ekirala	1 2 3 4 5 6 7 96	
32. 4.	Wakamala bbanga ki ku ddwaliro lino? **Ddamu ekitundu kimu kyokka kubino**	Essaawa Ennaku	 |____| ____| |____| ____|	

PART 2 – OKUSOMESEBWA KU BY'OBUYONJO

33. 6.	Okuva wewatuuse ku ddwaliro lino, wawuliddeko obubaka	Ye Nedda	1 0	Oba Nedda genda ku nnamba 8,

NO.	EBIBUUZO N'ENDAGIRIRO	EBIDIBWAMU	KOODI	OKUBUUKA
	bwona obukusomesa okwetangira endwadde awamu n'omwanawo naddala ezeekuusa kuby'obuyonjo?			
34.	Nsaba ombulireko ku byakusomesebwa			
35.	By'ombuidde wabiwulira wa/ babikusomeseza wa?			
36.	Okuva bwewatuuse ku ddwaliro lino olyabyeko ekipande kyona ekisomesa ku by'amazi n'ebyobuyonjo mu kifo kyonna muddwaliro lino?	Ye Nedda	1 0	
37.	Oba ye, bintu ki eby'enkizo by'osinze okusoma ku bipamde bino eby'ekuusa ku mazi n'ebyobuyonjo?	Okunaaba engalo Okulongoosa amazzi g'okunywa Okukuuma obuyonjo Okulongoosaebifo ebinetorodde Ekirla	Ye 1 1 1 1 96	Nedda 0 0 0 0

PART 3 – WATER

38.	Amazi agakozesebwa abalwadde mu ddwaliro lino bagagyawa? Ekidibwamu kisobola okusuka ekimu	Amazzi ga payipo Gagira mu payipo paka mu ddwaliro Gagira mu payipo paka mu lugya we'eddwaliro Taapu y'olukale Amazzi g'oluzi Oluzi olutali lwamuddumu nga lwa ddwaliro…… Oluzi olutali lwamuddumu ……. Oluzi olw'omudumu nga lwa ddwaliro Oluzi olw'omudumu olw'olukale	1 2 3 4 5 6 7 8 9 10 11	

NO.	EBIBUUZO N'ENDAGIRIRO	EBIDIBWAMU	KOODI	OKUBUUKA
		Nayikondo Nayikondo nga eri mulugya lw'eddwaliro Surface water Omugga Ekidiba/ ennyanja Ddaamu Ensulo Amazzi g'enkuba Amazzi bagaletera ku mmotoka Tewali mazzi Ekirala	12 13 14 15 96	
39.	Mundaba yo, omutindo gw'amazi gw'okunywa muddwaliro lino guli gutya?	Mayonjo Makyafu Ssimanyi	1 2 98	
40.	Lwaki olowooza amazi g'okuddwaliro lino malungi/ ssi malungi?			Buuza Q11=1 or 2
41.	Abalwadde b'omuddwaliro lino amazzi ag'anaaba engalo bagagyawa?	Ku ssiinki eri ku taapu Mu kabaketi akali ku taapu Baketi y'amazzi (teli ku taapu) Ekirala	1 2 3 96	
42.	Biddibwamu bakyala bokka abali mu waadi mwebazaalira Abakyala abazze okuzaala mu ddwaliro lino amazi bagagyawa?	Amazzi gali mu binaabiro (''Shawa'') Amazzi bagagya ku taapu Amazzi bagagya bweru mu bidomola… Ekirala	1 2 3 96	

PART 4 – EBY'OBUYONJO

43.	Okuva bwe wazze mu ddwaliro lino, okozesezako ku kabuyonjo?	Ye Nedda	1 0	
44.	Oba nedda, nsonga ki eya kulemesa okukozesa kabuyonjo ng'oli mu ddwaliro lino?	Nali setaaga Tewali kabuyonjo Kabuyonjo yali nkyafu Tewali mazzi mu kabuyonjo	1 2 3 96	

NO.	EBIBUUZO N'ENDAGIRIRO	EBIDIBWAMU	KOODI	OKUBUUKA
		Nali saagala kukozesa kabuyonjo Ekirala		
45.	Mundaba yo, kiki ky'olowooza ku bunji bwa kabuyonjo z'abalwadde mu ddwaliro lino?	Ntono nnyo Ntono Zimala Zimalira ddala Ssimanyi	1 2 3 4 98	
46.	Mundaba yo, kiki kyolowooza ku buyonjo bwa kabuyonjo mu ward gye bazaalisiza mu?	Nyonjo Nkyafu Ssimanyi	 1 2 98	
47.	Oli mumattivu n'obunji by'amazzi mu kabuyonjo?	Ye Nedda	1 0	SKP to Q22 if Yes
48.	Mundowooza yo, ki ekiyina okulongoosebwamu/ okukyusibwamu?			
49.	Mundowooza yo, kabuyonjo eziri ku ddwaliro lino zisaanidde okozesebwa abantu bano wammanga?	Abaana abali wansi w'emyaka ettaano Abakyala ab'embuto Abantu abalina obulemu) Abakadde	Ye 1 1 1 1	Nedda 0 0 0 0

PART 4 – OKUNAABA ENGALO N'EBYOBUYONJO

50.	Biseera ki by'otasaanidde kwelabira kunaaba ngalo? Tosoma bidibwamu	 Nga nvudde mu kabuyonjo Ngasinaba kutegeka mmere Nga sinawa mwana kyakulya oba kuyonsa mwana Nga sinaba newemala okulya emmere Nga mazze okusangula omwana obubi Ngamazze okukwata kubikyafu	Ye 1 1 1 1 1 1 1 1	Nedda 0 0 0 0 0 0 0 0
51.	Wali oyagaddeko okunaaba engalo ng'oli muddwaliro lino n'olemesebwa/	Ye Nedda	1 0	SKP to 26 if No

NO.	EBIBUUZO N'ENDAGIRIRO	EBIDIBWAMU	KOODI	OKUBUUKA
	n'otosobola?			
52.	Oba ye, nsonga ki ezaakulemesa okunaaba engalo nga oi ku ddwaliro lino? Tosoma bidibwamu	Tewaaliwo mazi gamala… Tewaali ssabuuni Nali mubwangu Ekirala	Y N 1 0 0 1 0 1 9 6	
53.	Waliwo ebizibu byonna ebiremesa abakyala okunaaba ku ddwaliro lino? Oba ye, bizibu/ buzibu ki?			
54.	Singa ona ojjukira, omuntu eyakebera ya naaba engalo emirundi emmeka nga tanatandika kukebera?	Bulikiseera Oluusi Tekyabaawo) Ssimanyi	1 2 3 98	

OBUDDE EBIBUUZO WEBIGWEREDE: _____ [ESSAAWA]_____[EDAKIIKA]