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Assessing Sanitation and Hygiene at Public Health Facilities: A Case Study on the University Teaching Hospital

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Abstract

Poor sanitation and hygiene conditions in health facilities negatively impact both individual and community health. In Zambia, infant, neonatal and under-five mortality rates are still quite high. While there are sanitation and hygiene standards in place for infection prevention and control in Zambian health facilities, issues with implementation and compliance have prevented the improvement of health conditions at the University Teaching Hospital. The purpose of this study is to assess the level of implementation and compliance by the hospital staff to the Water, Sanitation, & Hygiene Recommended Minimum Standards for Infection Prevention & Control in Health Care Facilities. In addition to detailed observations, interviews were conducted with UTH physicians, nurses and other health officers in order to garner a better understanding of this issue. Reasons for non-compliance with the current standards include negative staff attitudes, insufficient training and knowledge, limited resources, and a lack of support from hospital management. This paper argues that with adequate staff training, increased government funding and better resource allocation, consistent monitoring and evaluation, and a push for capacity building, UTH could improve its less than optimal conditions. As a result, overall patient and staff health and safety will be improved, specifically in terms of maternal, neonatal and child health.

Acronyms and Abbreviations

CDC- Centers of Disease Control and Prevention
HCAI Health Care Associated Infection
HCWM- Health Care Waste Management
HFAI - Health Facility Acquired Infection
IPC - Infection Prevention and Control
IPCS - Infection Prevention and Control Standards
IPG - Infection Prevention Guidelines
JHPIEGO- John Hopkins Information and Education on Gynecology and Obstetrics
LMIC - Low and Middle Income Countries
MDG - Millennium Development Goal
MNCH- Maternal, Neonatal and Child Health
NGO - Non-Governmental Organization
SDG - Sustainable Development Goal
SOP - Standard Operating Procedures
UNICEF - United Nations Children's Fund
UTH - THe University Teaching Hospital
WASH - Water, Sanitation, and Hygiene
WHO - World Health Organization

Definitions
Standard - a required or agreed level of quality or attainment
Guideline - a general rule or principle
Policy - a set of guidelines or rules that determine a course of action
Hazardous healthcare waste - waste that may create a variety of health risks
Non-hazardous healthcare waste - waste that is comparable to domestic waste

Background

According to the World Health Organization, sanitation refers to the provision of facilities and services for the safe disposal of human waste, including urine and feces, and the management of hygienic living conditions. Hygiene refers to conditions or practices that help to prevent the spread of disease, including but not limited to proper hand-washing. Both proper sanitation and hygiene are fundamental to maintaining both individual and community health. It has been shown that improving sanitation has a positive effect on health in communities around the world, as inadequate sanitation is a major cause of disease (World Health Organization [WHO], 2017a).

Nearly 2.4 million people live in Lusaka, one of the fastest growing cities in all of Africa and the capital city of Zambia (Africanews, 2017). As a product of its rapidly expanding population, Lusaka's improved sanitation levels have dropped in the recent decade, with almost half of its population having no access to improved sanitation. City residents living in lower-income communities continue to use pit latrines and septic tanks to manage waste, posing a risk to community health. In fact, septic tanks, if not maintained regularly, may contaminate water supplies in the area. Given the recent population boom, the city's institutions have failed to provide adequate hygiene and sanitation services. Additionally, a lack of infrastructure and continuous water shortages act as key barriers to improving less than optimal health conditions in the area (Water and Sanitation for the Urban Poor, 2017).

Despite its numerous efforts to improve MNCH outcomes, Zambia is still far from meeting the MDG target for reducing child mortality. According to the MDG 2013 Progress Report, recent declines in child mortality rates were not enough to reach the 2015 MDG target. From 1992 to 2010, under-five mortality rates for the country had only dropped from 190.7 deaths per 1,000 live births to 137.6 deaths per 1,000 live births. Infant mortality decreased from 107 deaths per 1,000 live births to 76.2 deaths per 1,000 live births in that

same time period, a decline too gradual to meet the MDG target. As stated in the report, Zambia needs to focus on improving child health as respiratory and diarrheal diseases remain a major threat to Zambian infants and children. In terms of the SDGs that came into effect in January of 2016, there has yet to be a report on Zambia's performance in further reducing these mortality rates (United Nations Development Programme, 2013).

Cholera is a critical diarrheal disease that can be contracted by consuming contaminated water or food. Although infected persons often show little to no symptoms, if not treated, death can ensue within hours of infection. In October of 2017, the CDC declared a cholera outbreak in the Lusaka Province of Zambia, with several hundred cases of the disease plaguing the city by December, and nearly 2,000 cases by January of the new year, according to one of the CDC's Morbidity and Mortality Weekly Reports from May 2018. In response to the epidemic, the Ministry of Health as well as other stakeholders, such as the Zambia National Public Health Institute and the WHO, enacted public health measures including "increased chlorination of the Lusaka municipal water supply, provision of emergency water supplies, water quality monitoring and testing, enhanced surveillance, epidemiologic investigations, a cholera vaccination campaign, aggressive case management and healthcare worker training, and laboratory testing of clinical samples". Although the number of cholera cases had declined in the months of January and February, during which time approximately 2 million doses of the cholera vaccine were given to Lusaka residents, strong flooding in March resulted in yet another spike in cholera cases for the province, causing widespread shortage of water for city residents. According to this report, by mid-May, the cholera epidemic had spread to 70% of the country, with a case fatality rate of 1.9% and leaving 98 residents of Lusaka dead. This event provides accurate insight into the current WASH situation and challenges in Lusaka and the surrounding area (Centers for Disease Control and Prevention, 2018).

According to the 2016 UNICEF Budget Brief for Zambia's water and sanitation sector, government allocation of money to this sector had been at a standstill for three years. The sector received ZMW 285 million for 2014-2016, a ZMW 90 million reduction from 2013 (UNICEF, 2016b). This drastic drop in government aid can be attributed partly to the

government withholding a larger portion of the budget, as well as inconsistencies in the reporting of aid by the sector. Despite 58% of the Zambian population residing in rural settings, 48% of the 2016 water and sanitation budget was allocated to urban areas, while 44% of the budget was allocated to rural areas. With a majority of Zambia's rural inhabitants lacking access to a clean water source and proper sanitation, the budget brief calls for a better division of resources (UNICEF, 2016b). Resource allocation should reflect the distribution of various population groups in the country and provide assurance that all citizens of the country have access to proper hygiene and sanitation services. However, it is important to note that urban areas should not be neglected when it comes to these issues, as urban populations are growing and cities are home to some of the country's most fundamental institutions. The percent share of the annual budget has also been in decline for the health sector in recent years. According to UNICEF's 2016 Health Sector Budget Brief, the share of the national budget has dropped from 11.3% in 2013 to 8.3% in 2016. The breakdown of the health sector budget into prioritized areas shows a very low percentage of funds allocated to WASH activities. In 2016, approximately 60% of the budget went towards personal emoluments, while only 9% went to medical infrastructure and equipment, and the construction and improvement of health facilities. (UNICEF, 2016a)

According to the WHO, improving WASH in health care facilities is an important step to improving overall health outcomes in communities (WHO, 2017b). There are many benefits of adequate sanitation, hygiene practices, and services in health care facilities. WASH services are essential for the improvement of infection prevention culture amongst health facility staff and communicable disease outbreak prevention and control, especially where the volume of patients and visitors is high. (WHO & UNICEF, 2016). Previously, WASH initiatives in healthcare facilities had focused primarily on addressing poor hand hygiene. While this is an important aspect of hygiene promotion, a broader scope is needed in order to encompass all relevant aspects, including those related to sanitation. Other relevant aspects to address include unsafe water and improper waste disposal (Ministry of Health & UNICEF, 2015). These substandard sanitation and hygiene conditions in health facilities contribute to the spread of HCAIs such as diarrhea, hepatitis,

and influenza. A review conducted by the WHO concluded that it is plausible that a significant HCAI disease burden is associated with poor WASH, and that this problem is most acute in LMICs, particularly in the most vulnerable populations. For example, the HCAI disease burden in the United States is 4%, while in LMICs it is about 40% (WHO & UNICEF, 2016). In addition, a 2015 global report from the WHO and UNICEF found that 40% of health facilities lack water supplies, 19% are without sanitation, and 35% do not have any hand hygiene materials. This large gap in WASH services hinders healthcare providers' ability to provide high-quality and safe care to patients. In order to address this gap, the WHO, UNICEF, and other partners have created an aim to achieve universal access to WASH services in all health facilities by the year 2030 (WHO & UNICEF, 2016). This aim is especially important as many literatures emphasize the importance of prioritizing SDG 6, Clean Water and Sanitation, especially in healthcare, in order to progress towards achieving SDG 3, Good Health and Wellbeing.

Waste management is an integral aspect of WASH in healthcare facilities, as hazardous waste puts human health at risk. The Ministry of Health, with support from the World Bank, has recently created a document called the National Health Care Waste Management Plan (2015-2019) as a guide to assist the country's healthcare institutions in the "planning and implementation of interventions that will reduce mismanagement of hazardous waste in Zambia" (Ministry of Health, 2015). The document emphasizes the importance of the MoH and other stakeholders prioritizing HCWM in order to decrease the prevalence of illnesses and injuries acquired by staff, patients, and visitors of healthcare facilities due to improper management and disposal of waste. Financing of these plans has proven to be a problem. According to the document, institutions are required to include HCWM financing in their annual actions plans in order to ensure the sustainability of the HCWM system, but this is not always the case. According to the National Healthcare Waste Management Plan, the five tertiary level hospitals in the country in combination produce about 11,796 kg of waste per day, with a large percentage of this coming from UTH. Proper management of this waste, both hazardous and non-hazardous,, is necessary for the betterment of public health.

It has been found that poor WASH practices negatively impact maternal, neonatal and child health. Although there is not much quantitative data on the subject, countries such as India, Bangladesh, Malawi, and Tanzania, which have the lowest WASH coverage in their regions, also have the highest maternal and neonatal disease burden (Ministry of Health & UNICEF, 2015). Overall, prioritizing WASH in the health sector has the potential to improve MNCH, as proper sanitation and hygiene practices ensure high quality healthcare services for these vulnerable populations. It has been proven that the presence of a hygienic birthing area almost halves the risk of neonatal mortality, and also reduced the risk of maternal infection (Seward, 2012). Currently, the number of health facility births is increasing globally, but without a concurrent increase in WASH standards in these facilities. The unavailability of safe sanitary facilities in hospitals and health clinics leads to poor service and staff absenteeism, which may discourage patients, particularly pregnant women from seeking care. Overall, the maternal and neonatal disease burden will continue to increase if WASH services in healthcare facilities do not improve (WHO & UNICEF, 2016). Furthermore, children are more susceptible than adults to acquiring diseases such as diarrhea, which is one of the leading causes of morbidity and mortality of children under five in Zambia and worldwide (Dehenney, 2005). Thus, child health should prioritized when considering the disease burden of WASH related infections in healthcare facilities.

According to the 2014 UN-Water Global Analysis and Assessment of Sanitation and Drinking-Water (GLAAS) findings, only 25% of all countries have policies on WASH in healthcare facilities that are implemented with funding and regular review (WHO, 2014). In Zambia, the district, provincial, and central health offices under the Ministry of Health are responsible for overseeing healthcare facility activities, including the implementation of WASH standards (Ministry of Health & UNICEF, 2015). The Zambian health system is divided into three levels of care: primary, secondary, and tertiary. The University Teaching Hospital, located in the city of Lusaka, is the largest tertiary hospital and referral center in all of Zambia. UTH has a total of about 1,700 patient beds, and is also a training center for medical students and nurses. The hospital aims to achieve the following objectives: to provide general health care to all citizens of Zambia, train healthcare personnel in

medicine, nursing, and other disciplines, conduct research on commonly recurring diseases in the region, and act as a referral center for all of the country's medical needs. Day-to-day operations of the hospital are handled by the Managing Director, who reports to the Ministry of Health. In addition to the managing director, there is a management team consisting of administrative, clinical, and nursing branches, which are critical in maintaining hospital standards.

Multiple studies have shown the negative effects of improper sanitation and hygiene practices and monitoring in health facilities. A study conducted by Nsubuga and Jaakola at Mulago National Referral Hospital in Uganda showed that 57% of the 526 nurses and midwives in the study had experienced at least one needle-stick injury within the last 6 months, and only 18% had never experienced one at all. Analysis showed that lack of training and knowledge were some predictors of needlestick injuries amongst nurses and midwives. Another study conducted at the University of Benin Teaching Hospital showed that low adherence to the appropriate precautionary guidelines when dealing with HIV/AIDS patients could be attributed to a lack of knowledge in 40% of the healthcare workers, and a lack of resources in 60% of the healthcare workers. Finally, a third study conducted by Hamomba in 2006 shows the positive effects of availability of resources and knowledge on adherence to HIV infection prevention guidelines by healthcare workers. Amongst midwives and trained birth attendants during deliveries in the Siavonga and Mazabuka districts, adherence to the guidelines was at 63.5%. Training and availability of supplies were key indicators for adherence in this study as well. The results showed that respondents who had been trained on the universal precautions were 24.89 times more likely to adhere to them than those who were not, and that respondents who received supplies on a weekly rather than monthly basis were 11.89 times more likely to adhere. Overall, these results show that utilization of infection prevention guidelines is very much affected by availability of knowledge and resources to healthcare workers (Munganga, 2007).

Introduction

Less than optimal sanitation and hygiene conditions in health facilities create negative outcomes for the staff and community of people they aim to serve. In Zambia, policies and standards have been developed using both international and Zambian guidelines. However, at the University Teaching Hospital, an inconsistent water supply and scanty amounts of government funding over recent years have meant that plans for improving health conditions in the hospital have been stagnant. Previous research studies have proven that noncompliance with such standards leads to higher rates of HCAIs and other negative healthcare outcomes. Thus, the objective of this paper is to assess the level of compliance with the Water, Sanitation, & Hygiene Recommended Minimum Standards for Infection Prevention & Control in Health Care Facilities in Lusaka, Zambia, through a case study of UTH. Furthermore, this paper will address reasons for non-compliance, and propose next steps for improvement of sanitation and hygiene conditions at the facility in order to also improve health (Munganga, 2007).

Methodology

A variety of resources were used in order to conduct research for this paper. The current Water, Sanitation, & Hygiene Recommended Minimum Standards for Infection Prevention & Control in Health Care Facilities were assessed for their ability to promote proper sanitation and hygiene practices at UTH. The level of implementation of these standards was assessed through detailed observations and interviews with experts and relevant stakeholders. The purpose for conducting these interviews was to gain a general understanding of the current state of sanitation and hygiene, the standards currently in place, and any barriers to their implementation. Following, this paper will include an analysis of our research findings, as well as their implications.

Rationale

This research focuses specifically on the sanitation and hygiene aspects of WASH. This is resulting from an overarching international push for a focus on hygiene as a key component of health improvement. It is difficult to separate sanitation from hygiene in

health facilities, as the two are highly interconnected. Further, sanitation and hygiene in conjunction have effects on individual and community health. An urban, resource-limited, setting was chosen due to its convenient location, and because much of the previous research on this subject focused on rural areas.

UTH was taken as the prime example of a public health facility in Lusaka due to the fact that it is the largest health center with the highest patient volume in the city. The conditions at UTH are representative of the urban health care experience that a large portion of the population receives. Additionally, the poorest and most vulnerable groups within Zambia often cannot afford to access private healthcare services. Also, preliminary research showed that there have not been any recent research assessments of UTH's compliance with infection prevention and control standards. We chose to assess the Water, Sanitation, and Hygiene Recommended Minimum Standards for Infection Prevention and Control in Health Care Facilities formulated in 2015, as opposed to the previous IPGs from 2003, as these standards are more relevant to UTH today.

Throughout our research, we honed in on MNCH by focusing more specifically on certain departments and wards within UTH that provide maternal, neonatal, and child health care. As mentioned previously, MNCH is an important indicator for the success of a health system. Mothers, newborns, and children are vulnerable populations that are at-risk for being negatively impacted by poor sanitation and hygiene practices in health facilities.

Policy Review

Water, Sanitation and Hygiene Recommended Minimum Standards for Infection Prevention and Control in Health Care Facilities

The WASH Recommended Minimum Standards for Infection Prevention and Control in Health Care Facilities was adopted in 2015 as part of a Millenium Development Goal Initiative- Accelerating the Reduction of Maternal, Neonatal, and Child Mortality. Developed by a WASH task force committee including members from the MoH, MCDMCH,

and other government bodies, this document proposes simplified guidelines and standards for WASH in healthcare facilities, and was developed based on pre-existing international IPC guidelines, in addition to pre-existing Zambian guidelines from 2010.

This WASH package has two focus areas. The first is a focus on access to quality infrastructure, including building design, construction and management. The second is a focus on adoption of sustainable and government-supervised WASH operations, maintenance, and hygiene practices by health facility staff. The goal of this initiative is to include a framework for the provision of trainings, SOPs, and tools, to health facility staff in order to ensure sustainability and successful implementation.

These recommended standards include five priority areas:

I. Access to adequate and clean water
II. Hand hygiene
III. Access to basic sanitation
IV. Solid waste management
V. Cleaning, decontamination and sterilization

In addition, standard operating procedures for coordination and monitoring of these practices are provided. For instance, the guidelines specify that each health care facility should have an Infection Prevention and Control Committee with clearly defined responsibilities including ongoing education of healthcare personnel, patients and visitors, and provision of PPE. All health facilities should also be receiving regular IPC and hand hygiene training for medical and non-medical staff, and be able to meet with district health officials and policy makers to address specific risks identified in the facility. Roles are also specified for training, capacity building, and monitoring by the district, provincial, and central health offices. The district health office is responsible for monitoring, supervising, and providing support to the health facilities.

Occupational Health and Safety Act

The Occupational Health and Safety Act of 2010 provides for the establishment of an Occupational Health and Safety Institute within the government, in addition to health and safety committees at workplaces. It also provides for the protection of persons at work from any health and safety risks associated with work activities.

Part IV, Section 15 states that an employer should ensure the health, safety, and welfare of employees at the workplace. Specifically, the employer should maintain systems of work that pose no risk to human health; ensure that articles, devices, items and substances provided for the use of the employees at a workplace are used, handled, stored and transported in a manner that is safe; provide information, trainings, instruction, and supervision which ensures health and safety at the workplace; and maintain a workplace and working environment that pose no risk to human health and safety. The employer should also provide for first-aid arrangements in the case of a workplace accident, in addition to providing the necessary PPE for all employees. Section 17 details the employees' responsibility to take care of their own, in addition to others, health and safety at the workplace, and to comply with the employers duties. Section 19 details that any person who has the management or control of a workplace shall ensure maintenance and repair of the workplace or any exit from the workplace, and ensure the health and safety of persons using the workplace. Part VII, Section 38 specifies regulations for the carrying out of this act. These include regulations that provide for occupational diseases and injuries and hazardous occupations, occupational health and safety standards to be established at workplaces, and the use of protective equipment by employees, amongst other provisions.

Other relevant acts include the Environmental Management Act of 2011 and the Public Health Act.

Research Findings

The following are research findings from observations and interviews conducted at the University Teaching Hospital.

Physicians from the University Teaching Hospital were interviewed in order to garner a better understanding of the current sanitation and hygiene conditions at the facility. According to a physician from the Children's Hospital, the Water, Sanitation, and Hygiene Recommended Minimum Standards for Infection Prevention and Control in Health Facilities are adequate, however the hospital lacks the resources to be able to carry them out. Another general physician who conducts research in the neonatal wards revealed that neonatal sepsis and HCAIs remain large issues at UTH because of improper hand hygiene practices by hospital staff. Multiple physicians agreed that because of the large patient load at UTH, the demand for services often outstrips the supply, and many SOPs for sanitation and hygiene often get overlooked during day-to-day operations at the hospital.

In addition to interviews with physicians, observations were made in specific wards of the hospital. Nurses and other hospital staff in these areas were also interviewed in order to find out more about the daily execution of sanitation and hygiene activities in the wards. The following are key findings from interviews and observations regarding the ongoing conditions in these wards:

1. In the pediatric surgical ward, which provides both inpatient and outpatient care for children, the patient and caretaker area has no hand washing facility. The nurses' bay is equipped with a mobile hand washing station, however according to a nurse, soap is often unavailable. Patients and visitors in this ward have one toilet facility that is not gender-segregated. In this toilet, there is no running water, soap, or provisions for menstrual hygiene management. Additionally, the floor is often wet and the drum provided for handwashing is filled with turbid water. While some waste bins are labelled "Food Waste" and "Diaper Waste", the same color bin and bin liner are being used for both. According to a nurse in this ward, the hand washing practices learned in nursing school are not easily followed due to a lack of resources, like soap. This nurse had not been re-trained on proper hand washing

practices since starting work at UTH. It was also emphasized that due to a lack of proper sharp boxes for waste disposal, this nurse had suffered a needlestick injury. Furthermore, while patient bed linens are supposed to be changed between every patient and decontaminated before being taken to the laundry, a nurse revealed that dry linens without any evidence of spills are usually taken straight to the laundry without being decontaminated. Additionally, linens without any identifiable spills are sometimes left in the ward to be used again for other patients. Overall, this nurse would like to see an improvement in reliability of the UTH resource supply.

2. In the obstetrics and gynecology emergency ward, the patient and visitor toilets are not properly signposted to distinguish between male and female. While there is running water from the sink faucet, there is no soap provided for hand washing. In addition, the toilets do not have a working flush and require water from the drum to aid in the flushing process.
3. In the neonatal intensive care unit, a nurse explained that the NICU rarely has problems following the proper sanitation and hygiene standards. According to this nurse, handwashing is easy because there are handwashing stations at every key point. This nurse also learned about proper handwashing practices in nursing school, but has been re-trained every three months since starting work at UTH. In this ward, the waste is collected every time the bins are full, and waste is segregated by type. This nurse also stated that bed linens are changed every time a patient leaves, but was unsure about the process of decontamination before being placed in laundry. Overall, this nurse believes that UTH management should monitor these conditions in the wards on a more regular basis, as not all wards are functioning at the same level.

Finally, a health officer of UTH, who wishes to remain anonymous, was interviewed about the facility's level of compliance with the Water, Sanitation, & Hygiene Recommended Minimum Standards for Infection Prevention & Control in Health Care Facilities. The Environmental Health Department carries out routine water testing, inspections of the wards and sanitation facilities, as well as many other duties. These interviews provided a

better understanding of the level of compliance with the standards amongst staff. Below are the key findings from the health officer's interviews. UTH showed low levels of compliance in all five of the priority areas mentioned in the Water, Sanitation, & Hygiene Recommended Minimum Standards for Infection Prevention & Control in Health Care Facilities. A more in-depth review of the health officer's responses on each standard included in the study can be found in Table 1 of the Appendix. It is to be noted that some of the conditions indicated by the health officer as meeting or partially meeting the standard do not meet the standard in actuality. Additionally, some standards were excluded from this study as they were repetitive, non-applicable to the urban-setting of UTH, or unable to be assessed due to a lack of information. These excluded standards are indicated with a strikethrough.

I. Access to Adequate and Clean Water

Most notable is the lack of continuous and sufficient water running through the hospital, with multiple supply interruptions happening throughout the day. As a result, there is often difficulty for staff to follow standard protocols. Drinking water and hand washing points are not adequately labeled throughout the facility. However, the hospital has made plans to purchase more signage to clearly indicate these points.

II. Hand Hygiene

As there are no established waiting areas for visitors, hand washing stations consisting of a water drum and basin are few in number and scattered throughout the hallways of the wards. Currently, a small percentage of the hospital's staff has been trained on proper hand washing practices, with most of the trained staff working in the Women's and Newborn Hospital.

III. Access to Basic Sanitation

Gender differentiation in the sanitary facilities is not always appropriately labeled for staff toilets. All toilets are equipped with a flush mechanism, however due to an unreliable water supply, water drums have been made available to aid with flushing. Although many of the patients of UTH are wheelchair-bound or disabled in some way, there is a lack of provision for individuals with disabilities such as

wheelchair ramps, adequate toilet space for wheelchair mobility, and wall-mounted handles.

IV. Solid Waste Management

Proper waste segregation is often absent, as the hospital lacks enough colored bins and bin liners coded for various types of waste. Currently, all bins in the hospital are black. Additionally, not all of these bins are labeled according to the type of waste that they carry. Instead, the wall is often labeled to inform hospital staff of where certain waste bins should be placed. There is often improper segregation and disposal of both hazardous and non-hazardous healthcare waste, leading to health risks, and an overflow of trash in the dumpsite and bins in the wards.

V. Cleaning, Decontamination, and Sterilization

Waste water from mopping bins is improperly disposed of in the hospital yard instead of in the sewage drain. Although they should be disposed of when three-quarters of the way full, sharp boxes are often filled to capacity. Staff do not always wear their PPE when cleaning, performing decontamination, and performing sterilization, despite having the appropriate PPE administered to them. It is possible that nurses are not properly disinfecting the beds in the wards after each patient since monitoring in these areas is often poor and inconsistent.

Conclusion

This study was aimed at assessing the level of implementation and compliance of hospital staff to the Water, Sanitation, and Hygiene Recommended Minimum Standards for Infection Prevention and Control in Health Care Facilities. Given the apparent discrepancies between the perceptions of the Environmental Health Department and the actual conditions in the hospital, it is clear that the level of compliance of staff is lower than perceived. For example, while the health officer was under the impression that menstrual provisions were present in all female toilets, such was not the case upon observation. Additionally, the toilets were not adequately labelled and the waste storage areas throughout the hospital were not secure, despite contradictory information

provided in the interviews. The findings revealed that the low level of compliance could be attributed to negative attitudes amongst staff, a lack of training, resources, and support from management. Overall, it was found that the standards are adequate and in alignment with international WASH standards for healthcare facilities (WHO, 2017b). However, this study has proven that the formulation of such standards does not imply or guarantee their proper utilization and implementation within a facility. Based on numerous interviews at UTH, it was discovered that there are many factors influencing the low compliance of the hospital staff. The main reasons for non-compliance are as follows:

Negative Staff Attitudes

As stated frequently in the expert interviews, negative staff attitudes play a major role in determining to what extent sanitation and hygiene standards are followed. These negative attitudes amongst some staff members may stem from a lack of knowledge about health risks and infection prevention, a feeling of being overwhelmed by a heavy work and patient load at UTH, as well as simply not being provided with the resources to properly carry out the protocols outlined in the standards document.

Lack of Resources

Resources such as gloves, disinfectants, soap, waste bins, and even running water are some of the key elements of a sanitary, hygienic, and properly functioning health facility. Without these important infection prevention materials, staff members often fail to follow protocol. According to prior research studies, JHPIEGO, a non-profit organization affiliated with John Hopkins University, had provided UTH with resources to carry out the the Infection Prevention Guidelines of 2003 (Chembe, 2010). The non-profit allocated decontamination buckets, utility gloves, bin liners, and other materials to the hospital, as well as training on infection prevention. It is unclear whether this procurement of medical items and training has continued into recent years, however it is evident that positive outcomes are not being seen and more resources are needed.

Lack of Training and Knowledge

A lack of knowledge amongst hospital staff can partly be attributed to differing education levels. During interviews with UTH nurses, it was found that some nurses had last received infection prevention training in nursing school. Nurses and medical doctors are more likely to have received this kind of training at some point in their academic careers. However, general workers and cleaning staff of the facility may not have ever been introduced to such standards in school. Alternatively, staff members like nurses, who have acquired knowledge from prior experience, may be resistant to complying with new and improved IPGs and protocols (Chembe, 2010). Evidently, infection prevention trainings to acquaint staff with the Water, Sanitation, & Hygiene Recommended Minimum Standards for Infection Prevention & Control in Health Care Facilities are not occurring as often as they should. This can be accredited to a shortage of funding that is needed to train the large number of staff employed at UTH. The Environmental Health Department and hospital management require this funding to provide manuals, incentives, and infection prevention materials for these training sessions. In 2016, UNICEF came to the hospital to train staff members in the Women's and Newborn Hospital. However, UTH has not received any recent training from external organizations, and as a result the majority of staff are untrained. Given this, staff are poorly equipped to promote infection prevention and properly use the accompanying materials.

Lack of Support from Management

Despite failures of the hospital staff and Environmental Health Department, this issue warrants a collective blame as hospital management has the responsibility to ensure workplace health and safety and have not been fulfilling this duty. There is also a need for increased monitoring of conditions in the wards. It is unclear the last time many of the hospital's workers have been properly trained. Additionally, the support of management is required in carrying out plans to create and implement an Occupational Health and Safety policy that aligns with the Occupational Health and Safety Act. This program would serve to improve health and safety throughout the hospital and increase the knowledge of IPC among UTH staff. With such a program supported by management, service delivery is

expected to improve and there will be a reduction in workers' exposure to health hazards from non-compliance with hospital standards.

Implications

Given the non-compliance with the Water, Sanitation, & Hygiene Recommended Minimum Standards for Infection Prevention & Control in Health Care Facilities and the resulting sub-standard conditions at UTH, swift public health measures should be taken to strengthen the organization and management of the hospital, as well as drastically improve the state of sanitation and hygiene in the facility. These measures include revitalizing staff communication and organization through capacity building, provisions of adequate staff training, better monitoring and evaluation by the Environmental Health Department and management, and increased government prioritization of these issues and better allocation of resources accordingly.

More in-depth and consistent training is necessary for staff to feel compelled to follow protocol and carry out good sanitation and hygiene behaviors for the benefit of themselves and patients. However, training methods may also need to be improved upon and more infection prevention materials issued to the facility in order to see an improvement. In order to guarantee that all hospital staff are acquainted with the sanitation and hygiene standards of the hospital, regardless of differing education levels, every individual, including medical doctors, nurses, and general workers, should be required to go through this training. This training should cover not only infection prevention, but also outline potential hazards and risks. Currently, UTH uses a compilation of various international, non-governmental, and Zambian guidelines for their WASH standards. For the sake of convenience and clarity, UTH should combine all of these guidelines to create one document that clearly outlines the sanitation and hygiene expectations of the facility. The hospital should also reimagine the guidelines in order to make them more applicable to the urban and resource-limited setting of UTH, as well as to Zambian culture. It is the responsibility of hospital management and related departments to be generally knowledgeable on WASH, assess whether these policies are feasible for the staff to follow, and act accordingly. To boost staff compliance, the terminology and

framework of the standards can also be altered to ensure that staff understand what is expected of them. Poor communication of standards was also shown to be a key reason for low levels of compliance. It was found that oftentimes, new staff members are simply trained informally by coworkers. Instead, upon being formally trained, staff should also be given a hard copy of the standards, including pictograms, or have the ability to access them at any time. Additionally, hospital staff should be reminded of these standards on a regular basis, as well as introduced to new protocols as they are formulated.

According to a health officer, a very small percentage of the funding granted to UTH every year is allocated to the Environmental Health Department and IPC measures. Because of this, it is not only important that more funding is allocated to the hospital, but also that the MoH places priority on sanitation and hygiene in order to ensure that enough money is being allocated to this area specifically. In health facilities, adequate WASH resources, such as hand washing soap and waste bins, are critical to preventing the transmission of diseases. As UTH services a rapidly growing urban population and referral patients from all over the country, health demands of the population often exhaust the facility's resources for many of the priority areas. UTH seemingly lacks the most necessary resources in the area of solid waste management. In addition to an increase in government funding allocation to the Environmental Health Department and IPC, UTH could also partner with biomedical technology and medical supply companies in Zambia in a rebate program as a possible solution. In forming these partnerships, UTH would be guaranteed medical supplies at a substantial discount, while Zambian companies would be ensured a consistent buyer and profit. Not only would UTH save money on important sanitation and hygiene promoting goods, but the facility would also help to support national businesses. Reliable provision of plastic bin liners, color coded waste bins, sharp boxes, and other items would allow for staff members to properly follow protocol. Additionally, UTH would be better equipped to manage epidemics, HCAIs, and the overall transmission of disease within the facility with these resources.

For many of the standards presented in this study, UTH has an existing protocol that outlines SOPs. However, these protocols are often being blatantly disregarded or only

partially followed. There were large discrepancies between what the Environmental Health Department believed the hospital's sanitation and hygiene conditions were and what was actually revealed during detailed observations of the wards. This in part can be attributed to a lack of monitoring by the department and hospital management, and also to a lack of monitoring by the government. Consistent monitoring of all hospital staff behaviors and levels of compliance is essential in providing insight into the effectiveness of the standards. Not only should the Environmental Health Department feel responsible for surveying the wards, but all staff members should feel the shared duty of holding each other accountable for meeting expectations and standards set by hospital management as well as the MoH.

Capacity building is defined by the WHO as the development and strengthening of human and institutional resources (who.int). Resources in this regard may refer to training sessions and infection prevention measures, as well as a team of individuals with a specified role. In the case of UTH, a lack of action and support by management, coupled with the limited numbered of resources, has resulted in poor organization within the facility. Thus, the overall solution is that the capacity of individuals at UTH and the institution as a whole need to be strengthened. With better training, knowledge amongst staff will increase and patient health can positively be impacted. Better and more consistent monitoring and evaluation by the Environmental Health Department and hospital management allows for departments to be reprimanded when protocols are not followed and increases accountability. Capacity building will also help better manage, implement, and sustain hospital programs when external aid from other organizations is not available. In this way, health promotion strategies, goals, and services will be revitalized. This will not only be beneficial for the betterment of patient health, but also the longevity of hospital goals and endeavors centered around these standards.

Many positive outcomes will result from implementing all, or even some, of these measures. Specifically, MNCH outcomes can be improved. Research has shown that increasing compliance with the WASH standards will decrease the burden of HCAIs and maternal and neonatal diseases. These tangible outcomes are greatly beneficial to the

community and country as a whole. Increased compliance with the standards will also lead to higher quality care for all patients at UTH, and create a safer environment for hospital staff and patients alike. As UTH is the largest hospital in the city and in the country, it can serve as a model for other health care facilities to begin prioritizing proper sanitation and hygiene practices as a means of improving health outcomes. According to WaterAid, "More attention needs to be paid by governments and other service providers to skilled management and maintenance of facilities" (wateraid.org). Capacity building is necessary because an institution like UTH should not have to solely rely on external aid to carry out WASH activities. However, the Zambian government can partner with NGOs to achieve these goals sustainably. Where the government is lacking in funds to support these initiatives for change, NGOs can step in to bridge the gaps in funding and collaborate to find the best solutions. By taking action to solve this prominent public health system issue, the Zambian government has the ability to improve the lives of many of its citizens.

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Appendix

Table 1. Classification of standards based on a health officer interview responses

STANDARD	DEFINITION: MEETS STANDARD	DEFINITION: PARTIALLY MEETS STANDARD	DEFINITION: DOES NOT MEET STANDARD	FINDINGS
I. Access to Adequate and Clean Water				
Sufficient and continuous water is available and distributed to collection points and water-use facilities	Yes	Sufficient water is only available sometimes	Sufficient and continuous is never available	Water is not available continuously throughout the day. The frequent supply interruptions because of the service company. **PARTIALLY MEETS STANDARD**
Water points are available in health facility to allow convenient access for the following uses: drinking water, medical use, infection control activities, personal hygiene, food preparation, laundry and cleaning. In health facilities receiving outpatients, access to drinking water points and hand washing points should be provided in the waiting	Water points are available for all activities and are conveniently accessible	Water points are conveniently accessible for some activities	Water points are not conveniently accessible for some activities	There is convenient access to drinking water. All water in the hospital is potable and pathologically safe. **PARTIALLY MEETS STANDARD**

area.				
Drinking water and hand washing points are adequately signposted	Yes, signs labeled clearly and visibly	Some of points are signposted adequately	None of the points are signposted	Currently, there are not many signs for hand washing points and no signs for drinking water. They have plans to buy more signs, possibly including pictograms for convenience **PARTIALLY MEETS STANDARD**
Mobile water points can be used to complement fixed water points	Yes	Points are few in numbers or not not functional	Not present	Hand washing basins and water drums were put out during the cholera outbreak to promote handwashing, some are still present **PARTIALLY MEETS STANDARD**
Turbidity should be less than 1 Nephelometric Turbidity Units (NTUs) and less than 5 NTU in resource limited settings	Yes	N/A	No	Water Chemistry Analysis Report from 19th June, 2018 showed that turbidity was less than 5 NTU in multiple wards of UTH **MEETS STANDARD**
Maximum values of 10				

µg/L arsenic and 1.5 mg/L fluoride in drinking water.				
Less than 1 Escherichia coli or thermotolerant coliform bacteria per 100 millilitre sample of drinking water at the health-care facility	Yes	N/A	No	Bacteriological Analysis Report from 19th June, 2018 showed that 0 CFU/100ml of fecal contamination was found in the water of multiple wards of UTH **MEETS STANDARD**
Each step in the water chain (from water supply point to water distribution/water use point) indicates low risk of fecal contamination	Yes	Some steps in the chain have a higher chance of fecal contamination than others	No steps in the water chain indicate a low risk for fecal contamination	Low risk of fecal contamination due to zero cross-contamination between the sewage and supply lines. The only risk comes from broken pipes (water is chlorinated to handle this) **MEETS STANDARD**
There are no tastes, odors, or colors that would discourage its usage	Yes	Some elements of the water discourage its usage	All elements of the water discourage its usage	Water Chemistry Analysis Report from 19th June, 2018 showed that the water in multiple wards

				of UTH had a clear appearance and inoffensive odor **MEETS STANDARD**
Water quality tests are conducted quarterly to identify actual and potential water contamination risks	Yes, water quality tests are conducted quarterly or more often	Tests are done fewer times than every quarter	Water quality tests are not at all	Tests for water pathological and chemical quality are conducted monthly **MEETS STANDARD**
II. Hand Hygiene				
Reliable handwashing facilities with clean water and soap or hand sanitizers are available in all treatment areas, waiting rooms and near toilets/latrines for patients and staff	Yes, and available in all treatment areas, waiting rooms, and near toilets/latrines	Hand washing facilities are available but only in some areas	Not present at all in the health facility	The facility was not set up with established waiting rooms in the wards. Hand washing basins are scattered throughout hallways in the wards **PARTIALLY MEETS STANDARD**

Hand washing facilities and surrounding areas should be cleanable (nonporous surfaces)	All hand washing facilities and surfaces are cleanable	Surrounding areas are not cleanable	Hand washing facilities are unable to be cleaned	Surfaces in the wards are cleanable and made of Terrazzo material **MEETS STANDARD**
Hand washing points, which do not provide potable water should be signposted accordingly				
Hand washing guidelines (SOP) to be available and observed by staff. Staff members have been oriented on hand washing practices	SOP is available for hand washing and staff have been oriented on them	SOP is available but staff have not been oriented on them	SOP is not present	Only some of the hospital staff have been trained on handwashing- most are from the women and newborn hospital **PARTIALLY MEETS STANDARD**
1 toilet for every 20 users for inpatient setting; this ratio includes inpatient, as well as staff. 1 toilet per 75 average daily female outpatients. For males, the minimum toilet outpatient (average daily male				

outpatient) ratio is 1:100, where urinals are available				
III. Access to Minimum Sanitation				
Water borne flushing toilets should be provided for when both sufficient and continuous running water is available and a septic system with adequate septic system management is available (including regular cleaning/pumping of the septic tank)	Flushing toilets are available for when water is available, septic system is available	Septic system is available but water drums are needed to aid flushing	Flushing toilets and septic system are not available	The toilets in the hospital flush. However, when sufficient and continuous water is not available, water drums with buckets are used to aid with the flushing process. UTH is directly to the city drainage, there is no on-site wastewater treatment facility (septic system) **DOES NOT MEET STANDARD**
Separate toilets for patients and staff; signposted accordingly	Separate toilets for staff and patients are available, signposted accordingly	Seperate toilets exist but are not clearly signposted	Staff and patients use the same toilets	Some toilets are not labelled to distinguish between patient and staff **PARTIALLY MEET STANDARD**
Separate male and female toilets; signposted accordingly	Separate toilets for males and	Seperate toilets exist but are not	Males and females use the same	In some areas the staff male and female are

	females are available, signposted accordingly	clearly signposted	toilets	the same, but for patients it is always separate **PARTIALLY MEETS STANDARD** **Upon observation, male and female toilets for patients were found to be inadequately signposted*
Provision for people with disabilities: provision of access ramp, toilet space, and entrance allowing wheelchair mobility, wall mounted handles; signposted accordingly	Provision for people with disabilities are available	Provision for people with disabilities are in disrepair	No provision for people with disabilities	The sanitation facilities were made for the general public and do not accommodate disabled individuals in regards to size. **DOES NOT MEET STANDARD**
Toilets have convenient hand washing facilities inside or right outside the block if shared	Hand washing facilities are inside or near the toilets	Hand washing facilities are available but is not near the toilet	Hand washing facilities are not available for toilets	Hand washing facilities are found right next to or outside the sanitation facilities **MEETS STANDARD**

Provision of a washing room in a private setting for women (can be a bathroom or water point in toilet with adequate washing and drainage facilities), provision of a bin for disposing of pads in all female toilets	Private washing room and proper menstrual sanitation items are available in facilities	Private washing room is available but does not provide a bin for sanitary pads	Private washing room and bins for sanitary pads are not available	There are menstrual bins in all of the sanitation facilities for the proper disposal of sanitary pads **MEETS STANDARD** **Upon observation, it was discovered that menstrual bins are not in all of the sanitary facilities*
IV. Solid Waste Management				
Waste segregation is performed at the point of generation through appropriate color coded containers or plastic garbage bags as as through sharp boxes. In the case where color coded containers or plastic bags are unavailable, the containers should be labeled. The personnel involved in health care waste management shall ensure that the waste bags are removed and sealed when they are no more than three-quarters full.	Proper segregation of waste is present and waste is disposed of when bin is nearing capacity	Protocol is in place, but not always followed by staff	Waste is not segregated in this matter	There is not consistency with the color of the bin and the bin liner. All of the bins right now are black, however there are plans to have colored bins by September. The bins themselves are not always labeled for the type of waste. There are only labels on the walls.

				DOES NOT MEET STANDARD
Labels shall be permanent and legible for the entire storage period; information on labels should include, waste type and source of waste	Labels are permanent with proper labeling	Labels do not include source of waste	Waste is not labeled	Correct labels are not present on the bin liners **PARTIALLY MEETS STANDARD**
All waste receptacles shall be labelled with basic information of their content				
Waste segregated storage should be available for non-hazardous/non-medical waste (domestic), medical waste (including infectious, pathological, and anatomical waste) in leak proof containers, sharps in sharp boxes, and pharmaceutical/chemical waste	Proper waste segregated storage is available for all types of waste	Seperate storage is only available for some types of waste	All waste is stored the same way	The waste segregated storage is available for all these types of waste. **MEETS STANDARD**
The hazards of the different waste will determine what storage room and containers should be used for its safe storage of the waste for transport until it has been treated or disposed of (Ex. ventilated rooms for waste that produces odors, protection from	Proper storage conditions are available for various types of waste	Waste is segregated but not safely stored (i.e. accessible to patients and visitors)	All waste is stored the same	There are different types of storage areas for different types of waste, with the sluice room acting as a temporary storage space for all waste.

rodents and rain, cold storage for anatomic waste such as placentas, leak proof containers when presence of fluids)				**MEETS STANDARD**
There is a cleaning and maintenance routine in operation that ensures that clean storage spaces are available at all times	Routine in place and followed	Routine is inconsistent and followed by only some staff	Routine is not in place	There is a storage space in each ward that is generally kept clean **MEETS STANDARD**
Waste generated inside the facility should be removed to onsite storage within 24 hours	Yes	N/A	No	Waste that is generated in the hospital is taken out on a daily basis **MEETS STANDARD**
The storage points for hazardous and non-hazardous waste shall be located separately	Yes	N/A	No	Non-hazardous waste goes to the dumpsite, while hazardous waste goes to the incinerator **MEETS STANDARD**
The storage facility shall be enclosed and surrounded by an impervious wall of appropriate height and provided with a gate and a lock	Storage facility is properly guarded with an impervious wall with an appropriate	Wall is present but gate does not have a lock	Storage facility is not surrounded by wall and gate is not functional	The dumpsite is enclosed by a gate. The incinerator and sluice room is only accessible to staff.

	height			**MEETS STANDARD** **Upon observation, it was discovered that the gate to the dumpsite is nonfunctional*
Waste bins shall be washed and disinfected each time they are emptied	Waste bins are washed every time they are empties	Waste bins are sometimes disinfected	Waste bins are never disinfected	This does not always happen due to a lack of training, knowledge, and poor attitude. **PARTIALLY MEETS STANDARD**
Radioactive containers must be brightly colored and clearly labeled "Radioactive Waste"				
Radioactive waste should be adequately packaged and contained for transport by licensed companies and managed in accordance with the Ionising Radiation Act				

Technical specifications for on-site incinerator should correspond to the health facility needs, and comply with Zambian standards, its human resource capacity, availability of appropriate training and an SOP should be available	Yes	N/A	No	On-site incinerator does not have an air cleaner installed. The incinerator does not comply with Zambian Law. **DOES NOT MEET STANDARD**
Protocols should be in place for regular collection and disposal of domestic waste	Yes	Protocol is in place but not being completely followed by staff	Not present	There is a specific time when hazardous waste should be taken to the incinerator. But some staff forget or disregard the protocol. **PARTIALLY MEETS STANDARD**
Collection and transportation of health care waste from facilities shall dovetail into the general waste management plan of the local authority				

Storage of waste must be segregated and color coded if possible, to allow for easy identification and prevent careless handling and the risk of secondary infection	Yes	Waste is storage is segregated but not color coded	No	The color coding system is not being properly implemented **PARTIALLY MEETS STANDARD**
Waste collection and transport: non-medical, non-hazardous waste is collected in a timely manner and transported safely	Waste is collected and transported within 24 hours	The collection and transportation of waste is inconsistent	Waste sits in the facility for more than 24 hours	All waste generated in the hospital is removed on a daily basis, but is not always transported in a safe and timely manner **MEETS STANDARD**
SOPs exist on the waste management process for handling, segregation, storage, collection, disposal, and incineration are available and observed by staff. Staff members have been oriented on SOP and accountable for SOP implementation	Yes	SOPs exist but are not always observed by staff	No	SOPs exists and are located in the Environmental Health Department Office, but they are not always followed **PARTIALLY MEETS STANDARD**
Waste management plan includes risks and mitigation measures are available	Yes	N/A	No	Yes, the waste management plan includes risk and

				mitigation measures **MEETS STANDARD**
V. Cleaning, Decontamination, Sterilization				
Appropriate PPE and cleaning supplies are available	Yes	Appropriate PPE and cleaning supplies are sometimes available	No	There are always challenges with supplies. There is enough PPE for staff but some will not wear certain pieces of equipment, such as utility gloves, because they are not trained **MEETS STANDARD**
SOPs for decontamination step-by-step should be available at HF, including chlorine dilution				
SOPs include checklist at each decontamination station with information about the used decontaminants				

SOPs for cleaning step-by-step should be available at health care facility, including chlorine dilution				
When sterilization is not possible or not indicated, High-Level Disinfection (HLD) is the only acceptable alternative for processing instruments or PPE that will be reused	Yes	N/A	No	UTH engages in HLD as an alternative to sterilization **MEETS STANDARD**
There should be 3 methods for carrying out HLD: boiling, steaming, soaking in chemical	All methods are carried out when performing HLD	Some methods are carried out by staff	None of the methods are implemented	Nurses use autoclave and the three methods. **MEETS STANDARD**
SOPs for HLD step-by-step available at health care facility				
Appropriate PPE, supplies and equipment available (for performing HLD)	Yes	Appropriate PPE, supplies, and equipment are sometimes available	No	PPE is available **MEETS STANDARD**
Logbook available for HCW performing task				

There should be 3 methods to carrying out sterilization: high-pressure steam (autoclave), dry heat (oven), chemical sterilants or radiation				
SOPs for sterilization step-by-step available for HF				
Appropriate PPE, supplies, and equipment available (for performing sterilization)	Yes	Appropriate PPE, supplies, and equipment are sometimes available	No	PPE is available **MEETS STANDARD**
Logbook available for HCW performing task				
Ensure proper maintenance of equipment, including autoclave				
All instruments/equipment shall be decontaminated, cleaned & dried prior to sterilization	Yes, instruments /equipment are always decontaminated, cleaned & dried prior to sterilization	Sometimes	No, this procedure is not followed	Surgical instruments are always decontaminated and sterilized **MEETS STANDARDS**

Surfaces that come in contact with clients, such as examination tables and patient bed, must be kept clean and decontaminated to avoid cross-contamination of patients and staff	Yes	Sometimes	Rarely or never	It is possible that nurses do not always follow this guideline since the Environmental Health team does not always go there and check **PARTIALLY MEETS STANDARD**
All surfaces, which may come in contact with blood, body fluids, secretions or excretions must be decontaminated by wiping them with a disinfectant solution (0.5% chlorine solution) after every client, regardless of whether it is visibly contaminated	Surfaces are always decontaminated with chlorine after every patient	Surface are decontaminated with chlorine but not after every client	Surfaces are not decontaminated with chlorine or after every patient	They may be cleaning with 0.5% chlorine sometimes, but not always **PARTIALLY MEETS STANDARD**
Any surface, which is visibly contaminated, must be decontaminated by wiping with a disinfectant solution (0.5% chlorine solution) immediately after the procedure	Yes	Surface is decontaminated but not immediately after the procedure	Surface is not decontaminated after the procedure	They may be cleaning with 0.5% chlorine sometimes, but not always **PARTIALLY MEETS STANDARD**

Small spills of blood, body fluids, secretions, or excretion must be decontaminated by wiping with a cloth soaked in disinfectant solution (0.5% chlorine solution). Big spills of blood, body fluids, secretions, or excretion should be flooded with disinfection solution (0.5% chlorine solution), if feasible allow to sit for 10 minutes before mopping up, but do not create a hazard where someone might slip and injure themselves				
Always wear gloves (utility gloves are recommended) when cleaning surfaces that may have come into contact with blood, body fluids, secretions or excretions	Yes	Sometimes gloves are worn	Gloves are not worn when cleaning contaminated surfaces	Surgical gloves are usually used when cleaning up spillage. **PARTIALLY MEETS STANDARD**
Remove covered contaminated waste containers and replace with a clean container				
Waste water used for cleaning should be discarded in the main sewer drainage system to avoid contaminating the environment	Yes, waste water is always discarded in main sewer drainage	Waste water is sometimes discarded in main sewer drainage system	No, waste water is improperly discarded	The waste water from mop buckets is disposed of outside instead

				of being put down the drain **DOES NOT MEET STANDARD**
Close and remove sharps containers when three quarters full	Yes, sharp containers are always removed when three quarters full	Sometimes	No, sharp containers are not removed when three quarters of the way full	The sharps in the containers are supposed to be disposed of when the bin three-quarters full, but this does not always happen **PARTIALLY MEETS STANDARD**
Remove soiled linen in closed leak proof containers	Yes, soiled linen is removed in leak proof containers	Sometimes	No; soiled linens are not removed in leak proof containers	The soiled linen are brought to the sluice room in bags and treated with chlorine and then brought to the laundry. **MEETS STANDARD**
Soak a cloth in disinfectant cleaning solution and wipe down all surfaces, including counters, table tops, sinks, lights, vents, etc.	Yes, procedure is always followed	Sometimes	No, procedure is not in place	Nurses use a cloth soaked in 0.5 chlorine to clean the counters and other surfaces

				MEETS STANDARD