# Facility Preparedness for Recurring Cholera Epidemics: A Case of Matero and Kanyama Sub-Districts, in Lusaka.

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## ABSTRACT

Cholera, an enteric disease of immense public health concern, causes an estimated 2.8 million cases with 91,000 deaths globally every year. The first cholera outbreak in Zambia was reported in the 1970s and several other outbreaks have occurred over the years, with the worst outbreak being in 2023/2024 with over 20,577 cases surpassing the past highest record 1991 outbreak that resulted in over 13,000 cases. During the 2009, 2010 and 2016 cholera outbreaks, Lusaka reported the highest number of cholera cases in Zambia. Zambia remains threatened by recurrent outbreaks of cholera, with more than 11 cholera hotspots spread across peri-urban areas and fishing camps. In Lusaka the hotspots include Matero and Kanyama constituencies/sub-districts. Each time Lusaka has cholera outbreaks, the cases are always overwhelming in the initial stages, something which made the researchers question the levels of preparedness especially that cholera has an established routine of starting at the onset of the rain season.

The study used mixed method (both qualitative & quantitative) research with exploratory descriptive approach as a research methodology. The study drew 70 participants from 9 health facilities in the sub-district that attended to a questionnaire and 9 facility heads that responded to a questionnaire. Data analysis was achieved through descriptive analysis of quantitative data using SPSS and thematic narrations for the qualitative data.

The findings show that 71.4% of the respondents came from facilities that were only partially prepared to handle cases of cholera should an outbreak occur. The study also found that 74.3% of the respondents had a negative attitude towards work regarding the outbreaks of cholera. The study revealed that 78.6% of the respondents indicated that their facilities had poor flow of materials and resources for management and prevention of the cholera outbreak. 85.7% indicated that their health facility administration policies and initiatives were poor when it comes to prevention and management of cholera cases.

The study concluded that the main reasons for partially prepared facilities were inadequate infrastructure, materials/equipment, human resource and poor attitudes of healthcare workers and administrative policies. Therefore, the study recommends provision of supplies and behaviour change including continuous capacity building of Healthcare Workers in response to Cholera and other emerging and re-emerging diseases (Epidemics). Further, we recommend for the development and evaluation of training programs for healthcare workers that focus not only on technical skills but also on improving attitudes and administrative

practices.

**Keyword**: Recurring Cholera, Preparedness, Health Facilities, Attitude, Initiatives

# INTRODUCTION

During the last few decades, medical organisations in many countries have instituted programs to maintain preparedness in order to cope with threats of mass-casualty incidents (MCI) (Siman-Tov, 2020). Meeting the challenge of emergency preparedness necessitates defining the components of readiness for an MCI (Golabek-Goldman, 2016). One definition is the preparedness pyramid identifies: (1) planning and policies; (2) equipment and infrastructure; (3) knowledge and capabilities of staff; and (4) training and drills as the major components of maintaining a high level of preparedness.

In order to maintain readiness in hospitals, disaster plans must be established. A disaster plan should serve as the mechanism for tailoring the response to specific scenarios and locations (UNHCR, 2020). Such organisational plans serve as a basis for an effective response to treating casualties during emergencies, as they delegate those who respond, prepare the necessary infrastructure, and train medical teams (Ryan J, Montgomery, 2005). An effective cholera control incorporates three major phases related to preparedness, response, and recovering (post-epidemic) phases (WHO, 2017). Although each of these phases is equally very important, the level of preparedness is the backbone of cholera control since the success of cholera outbreak response depends largely on it.

Soon after the novel coronavirus, SARS-CoV-2 (2019 nCoV), was first identified in a cluster of patients with pneumonia (Li et.al., 2020), in the Chinese city of Wuhan on 31 December 2019, rapid human to human transmission was anticipated (Huietal.,2020). The fast pace of transmission was wreaking havoc, stirring media hype and public health concern globally (Ippolito et.al. 2020). When the World Health Organization (WHO) declared the disease, (now officially named COVID-19) a Public Health Emergency of International Concern (PHEIC) on 31st January 2020 (WHO, 2020a), the Director General Dr Tedros Ghebreyesus justified the decision by stating that WHOs greatest concern was the potential for the virus to spread to countries with weaker health systems.

African countries including Zambia were not excluded from this concern. Repeated outbreaks of other preventable emerging and re-emerging infectious diseases with epidemic potential have taken their toll on the health systems of many African countries. The devastating 2014–2016 Ebola Virus Epidemic (WHO, 2020b) in West Africa, demonstrated how ill-prepared the affected countries were to rapidly identify the infection and halt transmission (WHO, 2020; Largent, 2016; Hoffman and Silverberg, 2018; Omoleke et.al., 2016). Similarly, the smouldering remnants of the 2018–19 Ebola Virus outbreak in the Democratic Republic of Congo, have demonstrated even for health services with considerable experience of dealing with a certain emerging pathogen, geography and sociopolitical instability, can hamper the response (Arunaetal., 2019)

Cholera, an enteric disease of immense public health concern, causing an estimated 2.8 million cases with 91,000 deaths globally every year (Ali, et al., 2015) is yet another measuring basis. It is an acute disease characterized by severe watery diarrhoea caused by toxigenic *Vibrio cholerae* strains belonging to serogroups O1 and O139 (Ismail, et al., 2013). The bacteria colonize the small intestine and produce an enterotoxin known as cholera toxin (CT) (Oguttu, et al., 2017). Pandemics that are caused by this bacterium have severely affected many countries on multiple continents for many years (Ramazanzadeh, et al., 2015). Cholera is transmitted via the faecal-oral route and is particularly associated with poverty and poor sanitation (Oguttu, et al., 2017). The first cholera outbreak in Africa was reported in 1836 along the Indian Ocean coast killing about 20,000 people (Olago, et al., 2017) No further outbreak was reported on the continent after the 1893-1894 outbreaks in the Senegambia region until the seventh pandemic reached the

continent in 1970 (Mengel, et al., 2014).

This pandemic caused massive outbreaks in Africa resulting in more than 400,000 cases with a high mortality rate (Harris, et al., 2012). Between 1995 and 2005, Africa experienced a greater upsurge in cholera outbreaks than other continents, with over 80% of the global total number of cholera cases (Griffith, et al., 2006). The trend of Africa reporting more cholera cases continued between 2006 and 2010 (Saidi, et al., 2014). In addition, over the past 10 years, several Southern African countries, such as Mozambique (Gujral, et al., 2013), Tanzania (Kachwamba, et al., 2017), Zimbabwe (Maponga, et al., 2015), South Africa (Ismail, et al., 2013) and Zambia (Olu, et al., 2013) have reported cholera outbreaks.

Zambia usually experiences cholera outbreaks during the rainy season and most of them have been associated with fishing camps, especially in the northern part of the country and in unplanned settlements of Lusaka and Copperbelt Provinces (Zambia Ministry of Health, 2011). The first cholera outbreak in Zambia was reported in the 1970s and several other outbreaks have occurred over the years, with the worst outbreak being in 1991 that resulted in over 13,000 cases (DuBois, et al., 2006). In the 2009 outbreak, a total of 4,712 cases were reported, while the 2010 cholera outbreak caused 6,794 cases, with the majority of the cases being from Lusaka Province (Olu, et al., 2013; Zambia Ministry of Health, 2011). In 2016 between February and June, Zambia experienced an outbreak with more than 1000 cases and 22 deaths being reported from Lusaka Province alone after a quiescent period of 5 years (Sladoje, 2018). During the 2009, 2010 and 2016 cholera outbreaks, Lusaka reported the highest number of cholera cases in Zambia (Zambia Ministry of Health, 2018).

Based on existing evidence, the highest cholera case fatality in Zambia is always registered at the beginning of each outbreak (Ngwa, et al., 2016). This is probably uncovering weaknesses of preparedness. Preparedness is multi-sectoral, multi-disciplinary, and is implemented at all levels of the health system (community and health facilities) (WHO, 2017).

Also, preparatory interventions are principally focused on reinforcing surveillance, training, prepositioning of supplies for case management, and improving (WASH) Water Sanitation and Hygiene (WHO, 2017). According to the Zambia National Public Health Institute cholera contingency plan (2018), the main strategies for cholera outbreak response include: surveillance, case management, training, communication for development, improving access to WASH, vaccination, coordination, operational research, resource mobilisation and monitoring. However, the monitoring and evaluation of these interventions are not done and information on the preparedness is usually lacking. this study assesses the level of preparedness to manage recurring Cholera epidemics in Matero and Kanyama sub-district of Lusaka District.

# MATERIALS AND METHODS

### Research Design

The study used mixed method (both qualitative & quantitative) research with exploratory descriptive study approach as a research methodology. It was thought that the combination of quantitative and qualitative methods would present a more enhanced insight into the research problem and question(s) than using one of the methods independently (Creswell, 2012).

An exploratory study is a valuable means to find out what is happening; seek new insights; ask questions and to assess phenomena in a new light (Robson, 2002). An exploratory design is conducted about a research problem when there are few or no earlier studies to refer to. The focus is to gain insights and familiarity for later investigation or undertaken when problems are in a preliminary stage of investigation.

**Study Setting**

The study was conducted in Matero and Kanyama Sub-district in Lusaka District of the Lusaka Province of Zambia. Matero and Kanyama are Sub-districts created for administrative convenience under the Ministry of Health. Matero is located about 13 km northeast of the Central business District, Lusaka. It has a total population of 320,580. (Zamstats, 2022). This is inclusive of male and female, young and old, natives and those from other towns and provinces that have settled in Matero either permanently or for purposes of school, employment and businesses among other ventures. The coordinates of Matero are: 15°22'33.0"S, 28°15'47.0"E (Latitude: -15.375823; Longitude: 28.263054). It is a high-density, working class neighbourhood. It used to be known for criminal activities, bad road networks and poor drainage systems. Currently the area has recorded a number of developments such as new roads, drainage systems and other infrastructure developments compared to what the area used to be. On the other hand, Kanyama is a compound located at the West edge of the city. Like in other African cities born in the colonial era, Lusaka experienced high migration from rural areas a few years before Independence in response to the industrialization and new job opportunities. The African migrants couldn't settle in the city itself because of colonial rule, so at the borders of the centre new informal settlements grew, often in a fragile environment not suitable for building houses. One of such slums is Kanyama constituency. The constituency has the following facilities; Kanyama First Level Hospital, Kanyama West Health Center, Self Help Health Post, Makeni Main Health Center, Makeni Transit Health Post, Makeni Villa Health Post, Lilanda Health Post and Soweto Health Post. Although, the services are still not enough to improve the degradation of the area and to meet the demand of the inhabitants. According to the 2022 census, the Kanyama Constituency has a population of 525,902 (Zamstats 2022).

**Participants**

The study population was all high-volume health facilities (facilities with high OPD attendance and with several health services) in Kanyama and Matero Sub-districts. Members of staff were also considered key informants on facility preparedness while administrators/in-charges were engaged only for the purpose of cross validation of study responses from health workers who are the focus of this study.

The target population for this study was Health workers (particularly those that were involved in the epidemic preparedness and response committee and having worked at the same facility for 2 or more years) in Kanyama and Matero Sub-districts. These two sub-districts were selected purposely based on the fact that they were cholera hot spot areas in Lusaka district which is one of the 11 districts in Zambia that are known as cholera hot spots in Zambia (MOH, 2022). The total of 9 facilities were classified as high-volume facilities; 4 from Matero Sub-district and 5 from Kanyama sub-district. From these 9 facilities, 70 health care workers that were members of the epidemic preparedness committee were included in the study as respondents.

**Data Collection**

In this study, we used a questionnaire and focus group discussions as the data collection tools. The questionnaire was a semi structured data instrument consisting of both open and closed ended questions. 6 focus group discussions were conducted of 8 members each and lasted 40-50 minutes. This allowed the researchers to triangulate the findings of the study and offer a chance to identify many aspects of facility level of preparedness and effective implementation of all hazard response plans or Disaster Management plans.

**Data Analysis**

Quantitative data from the questionnaires was analysed using the Statistical Package for the Social Sciences (SPSS) version 23 to identify trends and patterns within the facility epidemic preparedness committee population. Descriptive Statistics were used in form of frequencies, percentages, means, to describe participant demographics, and group characteristics.

Qualitative data from focus groups and interviews was analysed thematically using NVivo to identify key concepts and experiences related to support groups, with a specific focus on cultural influences. Thematic analysis was conducted by coding, whereby Interview transcripts are coded for recurring themes and patterns related to the research questions, and theme development, where codes were grouped and categorised into broader themes, with definitions and supporting evidence from the data. The findings of the study are presented in the form of frequency tables, figures and cross tabulation tables to show relationships among variables as well as thematic verbatim narrations of qualitative findings.

# RESULTS

**Administrative Initiatives/Policies**

Table 1 Administrative Policies

|  | Frequency | Percent | Valid Percent | Cum. Percent |
|---|---|---|---|---|
| Poor Administrative Initiatives | 58 | 82.9 | 82.9 | 82.9 |
| Good Administrative Initiatives | 12 | 17.1 | 17.1 | 100.0 |
| **Total** | **70** | **100.0** | **100.0** | |

Table 1 presents the participants' views about administrative initiatives regarding epidemic preparedness with the majority of respondents (58 participants; 82.9 percent) indicating that their health facility administration policies and initiatives were poor when it comes to prevention and management of cholera cases. 12 respondents (17.1 percent) on the other hand indicated that their health facility administrative initiatives were effective to handle cases of cholera.

Focus group discussions in the two sub-districts revealed that administration of the facilities was not proactive and only wait until there is a confirmed case before any serious interventions are implemented. The following are some verbatims from the discussants

*The problem is we are too used with cholera so our leaders in facilities do anything until there is a confirmed case for cholera.*

Another discussant added

*They don't support any activities around the prevention until its too late. Sometimes as staff, we normally plan some activities so that we don't report cases. Maybe they have some benefits which we don't know of when there is an outbreak. But again, I don't blame them that much because facilities don't even have enough funds especially for ideas which were initially not planned for.*

When asked to share some initiatives which are never supported the following were the common submissions;

*They are many, for example we organized ourselves to orient CBVs to start sensitizations but they said there was no money and at that time concentration should have been on typhoid fever. We explained that increase in typhoid fever in most cases tells of an upcoming outbreak but they still mention money issues.*

*We wanted to write to the business community to support sensitizations but we were told to first lobby for painting of the facility so that we don't overwhelm our would-be funders* added another discussant.

We probed the respondents if they had been trained or oriented on cholera in the year under review? This would be a good initiative on the part of facilities especially on case management to ensure effective patient care and reduced morbidity. The findings indicate a 100 percent non-training status among the facilities visited, a situation which poses danger should any outbreak occur and especially if it was a different strain of the bacteria.

**Attitude of Health Care Worker**

Table 2 Attitude of Health Care Worker

|  | Frequency | Percent | Valid Percent | Cum. Percent |
|---|---|---|---|---|
| Negative HCW Attitudes | 52 | 74.3 | 74.3 | 74.3 |
| Positive HCW Attitude | 18 | 25.7 | 25.7 | 100.0 |
| **Total** | **70** | **100.0** | **100.0** |  |

Table 2 shows the attitudes of health workers towards being prepared to manage cases of cholera should once it occurs. 52 respondents represented by 74.3 percent of the total number of respondents had a negative attitude towards work regarding the outbreaks of cholera. Only 18 respondents (25.7 percent) were positive and really wanted things to be in place to avoid or be able to handle cases of cholera without any difficulties.

Though focus group discussions, we probed the respondents to indicate how they felt whenever there was an outbreak of cholera in the District? The Majority 45 percent of the respondents prioritised the fatigue associated with response to the outbreak compared to the 15% percent that indicated that they felt like they were not doing enough to prevent the outbreak and calling for improved strategies to promote good health.

We further asked groups what they were doing to prevent cholera? The following were the responses from the majority;

*Well for now the focus is on covid-19 sensitization but since the preventive measures are the same we can say we are doing sensitizations.*

Another focus group member agreed with sensitizations for cholera in the covid-19 context.

At the same time other group members indicated that they had no cholera specific interventions which they were involved in at that particular time when the researcher collected data.

In the same focus group discussion, a question "without supervision how do you operate?" was asked and the respondents highlighted the following;

*Well I report for work on time and see my patients and attend any meetings called upon.*

Another respondent said;

*It's normal work for me and I love to work without close supervision.*

The researcher clarifies the question to mean their activities meant to prevent cholera and they responded as follows;

*For me whenever I report for duty I practise standard based precautions including hand washing and use of PPE, I believe they can prevent any unknown disease coming to me.*

Another said;

*I participate in outreach programs for sensitizations whenever they are organised. The other thing is, as an individual, you can't come up with your own program but it has to be a facility program and they are planners responsible for these plans.*

These findings reveal a negative attitude by the majority of health care workers that ultimately contributes to poor levels of preparedness of the health facility as human resources make a facility tick and ultimately saves life. This needs to improve looking at the cholera outbreak trends in the said Sub-Districts.

**Resource Availability**

Table 3 Resource Availability

|  | Frequency | Percent | Valid Percent | Cum. Percent |
|---|---|---|---|---|
| Poor Flow of Resources | 55 | 78.6 | 78.6 | 78.6 |
| Good Flow of Recourses | 15 | 21.4 | 21.4 | 100.0 |
| **Total** | **70** | **100.0** | **100.0** | |

Table 3 shows the availability of resources and materials to use should an outbreak occur in a health facility or the general public. The majority of respondents (55 respondents representing 78.6 percent of the study participants indicated poor flow of materials and resources for management and prevention of the cholera outbreak. 15 respondents (21.4 percent) indicated that materials were readily available almost at all times and restocking was not a problem.

The focused group discussion revealed that the majority of those that held that materials were available are those from the stores and pharmacy and were only saying so to shield the inconsistent flow of these materials.

The focus group discussion revealed that facilities had epidemic preparedness kits but at the same time these kits were not well stocked with relevant supplies. Further a non-participatory observation showed that the list of supplies was never updated from 2018, indicating lack of review and restocking of adequate supplies required for Preparedness. This showed a poor work attitude on the part of the one responsible for the kits which the researcher established to be the Environmental Health Practitioners. In a focus group discussion, a debate arose on the question, "who is responsible for the epidemic preparedness kit?"

Some said it was the EHP or EHT while others said it was the Pharmacy personnel responsible for restocking it. After a lengthy debate, it was concluded that the EHT was responsible for updating it and requesting for the supplies which the pharmacist must supply. When did you last receive cholera supplies?

Majority of the respondents said 2018 while a few others said these supplies are supplied but not for specific purposes of cholera preparedness. For the year in question all (70 respondents) indicated that they had not

received supplies for cholera prevention.

This meant that the facilities may lose the first cases of cholera until they are supplied with the materials. Critical to this is infrastructure, especially isolation facilities, looking at the fact that cholera is a communicable disease. It is also a requirement that the facility is well stocked or equipped with supplies to respond to the first 100 cases.

**Health Facility's Level of Preparedness**

Table 4 Health Facility's Level of Preparedness

|  | Frequency | Percent | Valid Percent | Cum. Percent |
|---|---|---|---|---|
| Partially Prepared Facility | 20 | 28.6 | 28.6 | 28.6 |
| Prepared Facility | 8 | 11.4 | 11.4 | 40.0 |
| Facility not Prepared | 42 | 60.0 | 60.0 | 100.0 |
| **Total** | **70** | **100.0** | **100.0** |  |

Table 4 indicates the findings of the level of preparedness for health facilities under Kanyama and Matero sub-districts. The table shows that most of the respondents (42 healthcare workers representing 60.0 percent of the study participants) came from facilities that were not prepared to handle cases of cholera should an outbreak had occurred. 8 respondents representing 11.4 percent of the respondents indicated that their health facilities were prepared to handle cases of cholera if an outbreak occurred. From the researcher's observations using a non-participatory observation guide, it was observed that the health facilities lacked infrastructure for isolation of these cases, they had poor policies on management of these cases prior to any outbreak based on their epidemic preparedness plans which were not available in most facilities. This situation suggests that these facilities are likely to lose life in the early stages of an outbreak due to poor systems as shown in these other indicators which influence the level of preparedness for these Health facilities.

**Correlations Between Variables**

Table 5 Correlation between Facilities level of Preparedness and other Variables

|  | FLP | AI | AHW | RAT |
|---|---|---|---|---|
| Facility's Level of Preparedness (FLP) | 1 |  |  |  |
| Administrative Initiatives (AI) | .052 | 1 |  |  |
| Attitudes of Healthcare Workers (AHW) | -.172 | -.094 | 1 |  |
| Resource Availability Trends (RAT) | -.146 | .040 | -.068 | 1 |

From the findings, they are no scientifically significant relationships that could be established at the set level of confidence.

# DISCUSSION AND IMPLICATIONS

## Administrative Initiatives/Policies

The study found that most facilities (85.7 percent) had poor administrative policies/ initiatives regarding

cholera preparedness. When we looked through the questionnaire concerning the work schedules during an epidemic, all the 9 facilities indicated that they didn't operate with schedules to allow staff to rest. This affected health care workers as were usually fatigued in times of epidemics. In terms of pre-epidemic preparedness which includes sensitizations on cholera and meetings to prepare for any possible outbreaks, 85.7 percent of participants from the 9 facilities indicated that their administration was not focused on these indicators at that moment adding that their concentration was on Covid-19 despite the threat which comes with the on-set of the rain season.

A key component to strengthening internal systems is promoting supervisory practices that are consistent, relevant and positive, which contributes to sound decision making for effectiveness and efficiency in implementing activities in achieving set goals and results.

Several studies linked inconsistent or infrequent supervision to poor performance (Nyantema, 2010; Masanja et al., 2013; Eson & Fatusi, 2014). A study of HCWs in obstetric health facilities in Malawi, Mozambique, and Tanzania found that for mid-level workers supervision is frequently absent, and when it is present it is solely corrective (McAuliffe, et al., 2013). Perhaps even more importantly, the study found that inappropriate or absent workplace supervision is a strong predictor of HCWs' intentions to leave their position, and that negative supervision was almost as de-motivating as no supervision. Thus, interventions can improve health services and health worker retention not only through ensuring the existence of supervision but targeting supervisors directly to improve their supervisory methods.

Research demonstrates that supportive supervision can lead to improvements in health care performance. An evaluation of a supportive supervision program in Nigeria among malaria case workers found that the program led to not only significantly improved knowledge scores in the control group, but also led to an increase of case workers following the guidelines from 33 percent during the first visit to 71 percent following the third visit (Bello, et al., 2013). Similarly, a supportive supervision intervention in lower-level facilities in Uganda used supervision that included assessment of skills, support for problem solving, review of health records, and development and review of work plans (Namazzi, et al. 2015).

Furthermore, it also used quarterly mentoring by district and national management which was integrated within a more comprehensive health care program. The program resulted in significant improvements in facility deliveries and birth outcomes, as well as a reported improvement among health workers' confidence and skills in various activities. A second study of obstetric workers in Ethiopia reinforces the finding that the method of supervision can have an important impact on worker morale.

The study was asking the question, what administrative initiatives have been formulated in health facilities of Kanyama and Matero Sub-Districts towards cholera outbreaks? The study found no cholera specific initiatives were in place despite the threat which came with the rainy season.

**Attitude of Health Care Worker**

The study found that 74. 3 percent health care workers in the facilities had negative attitudes towards cholera preparedness which also contributed to partial levels of preparedness discussed below on the theme levels of preparedness.

These findings are similar to findings that state that Perceived negative attitudes of HCWs can be a major deterrent for those seeking care (Beltman et al., 2013; Majrooh et al., 2014; Ibrahim et al., 2014; Moyer et al., 2012). For example, community members in the Democratic Republic of Congo reported that friendliness of health personnel was the most important determinant of their choice of health facility (72 percent) while quality of care and proximity were only 69 percent and 61 percent, respectively (Fox Witter, Wylde, Mafuta & Lievens, 2013). Similarly, several studies found that judgmental and rude treatment by

HCWs was a major deterrent to delivering in a healthcare facility or seeking antenatal care (Moyer et al., 2012; Dhingra et al. 2014; Mason, et al., 2015)

Several studies observed the impact of social norms on providers' willingness to provide contraception methods to clients. In Uganda, a study found that only a quarter of providers were comfortable giving contraceptives to sexually active young people, with 14 percent of providers stating that, as parents, it was impossible to give contraceptives to young people because it was morally unacceptable (Nalwadda, Mirembe, Tumwesigye, Byamugisha, & Faxelid, 2011). The researchers suggest that providers' restrictions and behaviour might reflect their own personal attitudes and values, rather than evidence-based knowledge and national policies and guidelines.

A study in Senegal found similar results, and additionally found that male providers were more likely to report applying a minimum age restriction to injectable contraception (54 percent vs. 39 percent) and were more likely to restrict access to at least one of the three methods of contraception studied (58 percent vs. 45 percent) (Sidze, Lardouz, Speizer, Faye, Mutua, & Badji, 2014). This study also found that in the public sector nurses were more likely than other providers to have a minimum age restriction. Calhoun et al. found that in India, not only did doctors set restrictions on minimum age for eligibility for contraception, 80 percent also reported setting a maximum age, thereby denying contraception to women who still might have a need for family planning (2013).

The researchers suggest that these findings may be a product of providers adhering to cultural practices that are guided by strong patriarchal norms, leading to gender inequality and disempowered women. A study in Pakistan reported similar results, and found that clinical training was not associated with providers' attitudes and beliefs regarding appropriate candidates for intrauterine devices (IUDs), suggesting that technical interventions may fall short of changing provider attitudes and perceptions towards those procedures (Agha, Fareed, & Keating, 2011).

The major question on this variable in this study was; what is the pre-epidemic attitude among health workers of Kanyama and Matero Sub-District towards outbreaks of cholera? The study has found negative attitudes among the majority of the respondents in the study.

## Resource Availability

The study revealed poor availability and flow of relevant resources (78.6 percent) for the management of cholera cases in the facility. Consistent with these findings, other researchers found that many health care facilities, particularly those in more remote areas, lacked the most essential infrastructural elements (Qureshi et al., 2010; Mwaka et al., 2013; Kalk, Paul, & Grabosch, 2010; Ojaaka, Olango, & Jarvis, 2014). An evaluation of facilities providing TB care in South Africa found that the physical structures lacked several TB infection control measures, such as opening windows and fans to provide air circulation, leading to increased susceptibility to TB transmission (Malangu & Mngomezulu, 2015). In Sierra Leone, health care facilities often lacked running water and incinerators (Pathmanathan et al., 2014).

In Ethiopia, phone lines were commonly not available to call hospitals to make emergency obstetric referrals (Austin et al., 2015). Deficiencies in the physical facilities can also influence community members' likelihood for utilising facility health care. For example, a survey of community members and health workers in Tanzania found that the unavailability of beds at hospitals was a prime reason for not delivering at hospitals (Dhingra et al., 2014). Namazzi et al. (2015) found that redesigning and reorganising existing space helped to make better use of the existing infrastructure and alleviate patient bottlenecks, presenting a possible approach in some circumstances.

A literature review exploring retention factors in rural areas identified the availability of equipment as a

determining factor in HCWs' decision to stay or leave a remote area (Lehmann, Dieleman, & Martineau, 2008). This finding was supported by a study of HCW retention in Kenya, which found that 43 percent of workers interviewed reported not having the necessary equipment, which increased their likelihood to leave their current position (Ojakaa, Olango, & Jarvis, 2014). Lack of proper equipment can also influence the health seeking behaviours of patients. Magadzire et al., found that efforts to promote down-referral, or transferring patients to the clinics nearest their home, were largely not successful because patients would rather travel further to a better-equipped and better-staffed hospital than go to their local clinic (2014).

Drug stock-outs also limit health care workers' ability to effectively address the health needs of the communities in which they serve (Opondo, et al., 2009). Nurses in Uganda reported stock-outs of non-HIV drugs to treat malaria and infections as a significant challenge (Nankumbi et al., 2011). Similarly, Farmer et al. found that stock-outs of various methods of contraception in health facilities had a major impact on the quality of health services that women received (2015). Stock-outs were also shown to have a significant influence on community members' confidence in local clinics, and could have a negative impact on care-seeking behaviours (Magadzire et al., 2014).

A study in Pakistan found similar results, with the lack of functional equipment, medicines and supplies being perceived by HCWs as a major underlying factor for low coverage and quality (Majrooh, Hasnain, Akram, Siddqui, & Memon, 2014). In some cases, supply shortages are perceived as the most significant factor in preventing quality of care. For example, lack of equipment and supplies was a reported barrier to cervical cancer screening by 53 percent of HCWs surveyed, higher than any other perceived barrier (Kress, et al., 2015).

Lack of supplies and equipment can increase a HCWs' likelihood of leaving their current position. An assessment of the availability of resources for the provision of basic Neonatal care in Kenya found that important structural components for providing newborn care were often unavailable, including lack of supplies such as cleaning materials, oxygen supply and delivery systems, lab tests, drugs and consumables (Opondo, et al., 2009).

The study sought to answer the question; what are the trends in resource availability in health facilities of Kanyama and Matero Sub-Districts towards cholera outbreaks? The findings have shown poor trends in resource availability suggesting a poor level of preparedness.

**Health Facility's Level of Preparedness**

The study found facilities were only partially prepared for cholera epidemics and this still brought concern as human life is lost in ill prepared facilities. Facilities had human resource deficiencies, implementation gaps, and infrastructural inadequacy that includes the beds for admissions as most of the patients would remain at triage without bed space contributing to this level of preparedness.

Health care workers in low- and middle-income countries often work within health systems that lack the proper protocols and standards to ensure quality and efficiency of care. Because the effectiveness of HCWs is largely dependent on the systems in which they work, the lack of clear and standardised operations can be a barrier to improved performance. Several articles found that health facilities lacked even basic operating procedures, leaving health workers without any formalised resource for guiding patient care.

An assessment of health facilities in Sierra Leone during the recent Ebola virus disease outbreak found that no district had an infection prevention and control standard operating procedure at any level for proper screening and isolation of patients suspected to have the Ebola virus, and screening procedures at all facilities were inadequate (Pathmanathan, et al., 2014). An assessment of neonatal care facilities in Kenya found that, of the eight domains considered, hospitals scored poorest in Systems of Care, and that patient

management guidelines were missing in all sites (Opondo, et al., 2009).

One of the reasons found contributing to partial preparedness was lack of adequate human resources in the facilities. Similarly, Lack of professional health care workers, particularly in high-need facilities such as public and rural clinics, can lead to a huge strain on existing workers and ultimately to poor health outcomes for clients.

A study of human resources requirements in South Africa found that all six districts analysed had a drastic shortage of doctors, with only 7 percent of the required number of doctors and 60 percent of the required nurses. These shortages and poor distribution of staff lead to a diminished quality of services, with lower-level staff forced to perform the tasks of high-level staff with poorer results (Daviaud & Chopra, 2008). These shortages can have serious implications for patients' health, as found by Beltman et al. in a study that determined that lack of human resources was a major contributor to the high incidence of facility-based haemorrhages in Malawi (2013).

## CONCLUSION

The study was carried out to assess the level of preparedness to manage recurring epidemics of Cholera in Kanyama and Matero Sub-Districts of Lusaka District. The study concluded that the facilities were ill prepared to handle recurring cases of cholera in the Sub-District should it occur. This conclusion was based on the findings on the independent variables as follows; The study found that 74.3% of the respondents had a negative attitude towards work regarding the outbreaks of cholera. The study revealed that 78.6% of the respondents indicated that their facilities had poor flow of materials and resources for management and prevention of the cholera outbreak. Further the study had also reviewed that 85.7% of the respondents from the facilities had poor administration policies and initiatives when it comes to prevention and management of cholera cases. Kanyama and Matero Sub-Districts could lose many lives should an outbreak occur due to lack of preparedness.

We recommend conducting behaviour change workshops targeted at improving attitude towards work for healthcare workers aimed at Continuous capacity building. Provide a robust program for monitoring and provision of essential materials and equipment to facilities to promote prompt management of cases in epidemic situations. Strengthen policies on facility management and their initiatives to promote standard preparedness levels through management workshops. Health Care Workers working in the facilities should; Improve their attitudes towards work generally through proactiveness and self-discipline. Dialogue with administration to ensure supplies are provided in good time and ensure capacity is built in the available staff. We recommend for policy changes at the governmental level to ensure sustained support and resources for cholera preparedness and response.

As an extension of this study, more Sub-Districts should be involved to come up with the general picture in the nation regarding facility preparedness and its effects on health performance at all levels. The other study could be an exploration of external factors (e.g., governmental policies, community engagement) that impact facility preparedness.

## REFERENCES

1. Ali M, Nelson AR, Lopez AL, Sack DA. (2015). Updated Global Burden of Cholera in Endemic Countries. Remais J V., editor. PLoS Negl Trop Dis [Internet]. 9(6): e0003832. Available from: http://dx.plos.org/10.1371/journal.pntd.0003832 pmid:26043000
2. Ali M, Sen Gupta S, Arora N, Khasnobis P, Venkatesh S, Sur D, et al. (2017) Identification of burden hotspots and risk factors for cholera in India: An observational study. Moise IK, editor. PLoS One [Internet]. 12(8): e0183100. Available from: doi: 10.1371/journal.pone.0183100. pmid:28837645

3. Azman AS, Ivers LC, Legros D, Luquero FJ, Mintz ED. (2016). Safe water, sanitation, hygiene, and a cholera vaccine. Lancet [Internet]. 387(10013):28. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0140673615012945

4. Bompangue D, Giraudoux P, Handschumacher P, Piarroux M, Sudre B, Ekwanzala M, et al. (2008). Lakes as source of cholera outbreaks, Democratic Republic of Congo. Emerg Infect Dis [Internet].; 14(5):798–800.

5. Bwire G, Ali M, Sack DA, Nakinsige A, Naigaga M, Debes AK, et al. (2017). Identifying cholera & quot; hotspots & quot; in Uganda: An analysis of cholera surveillance data from 2011 to 2016. Ivers LC, editor. PLoS Negl Trop Dis [Internet].; 11(12): e0006118.

6. Central Statistical Office. (2015). Living Conditions Monitoring Survey Report [Internet]. 2015 Available from: https://www.zamstats.gov.zm/phocadownload/Living_Conditions/2015 Living Conditions Monitoring Survey Report.pdf

7. Central Statistical Office. (2010). Census Report [Internet]. 2010 Available from: http://www.zamstats.gov.zm/index.php/publications

8. Francisco L, Elisabeth S. (2009). Cholera outbreak in Lusaka, Zambia:2008–2009 and analysis of historical cholera data: 2005–2007.

9. George CM, Monira S, Sack DA, Rashid M, Saif-Ur-Rahman KM, Mahmud T, et al. (2016). Randomised Controlled Trial of Hospital-Based Hygiene and Water Treatment Intervention (CHoBI7) to Reduce Cholera. Emerg Infect Dis [Internet].

10. Heilbron DC (1994). Zero-altered and other regression models for count data with added zeros. Biometrical Journal, 36(5):531–547.

11. Kelsall J, Wakefield J. (2002). Modeling Spatial Variation in Disease Risk. J Am Stat Assoc Available from: http://www.tandfonline.com/doi/abs/10.1198/016214502388618438

12. Kulldorff M, Heffernan R, Hartman J, Assunção R, Mostashari F. A (2005). Space–Time Permutation Scan Statistics for Disease Outbreak Detection. Blower SM, editor. PLoS Med

13. Khonje A, Metcalf CA, Diggle E, Mlozowa D, Jere C, Akesson A, et al. (2012). Cholera outbreak in districts around Lake Chilwa, Malawi: lessons learned. Malawi Med J [Internet]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/23638267 pmid:23638267

14. Lawson (2001). Disease Map Reconstruction. Stat Med.;20(14):2183–204. doi: 10.1002/sim.933. pmid:11439429

15. Lopez AL, Macasaet LY, Ylade M, Tayag EA, Ali M. (2015). Epidemiology of Cholera in the Philippines. Ryan ET, editor. PLoS Negl Trop Dis [Internet]. Available from: doi: 10.1371/journal.pntd.0003440. pmid:25569505

16. Mengel MA, Delrieu I, Heyerdahl L, Gessner BD. (2014). Cholera Outbreaks in Africa. In Springer, Berlin, Heidelberg; Available from: http://link.springer.com/10.1007/82_2014_369

17. Ministry of Health Zambia. Department of Public Health & Disease Surveillance (2018). Available from: http://www.moh.gov.zm/?page_id=5221

18. Najnin N, Leder K, Qadri F, Forbes A, Unicomb L, Winch PJ, et al. (2017). Impact of adding hand-washing and water disinfection promotion to oral cholera vaccination on diarrhoea-associated hospitalisation in Dhaka, Bangladesh: evidence from a cluster randomised control trial. Int J Epidemiol.

19. Poncin M, Zulu G, Voute C, Ferreras E, Muleya CM, Malama K, et al. (2018). Implementation research: reactive mass vaccination with single-dose oral cholera vaccine, Zambia. Bull World Health Organ.

20. Siman-Tov M, Davidson B, Adini B. (2020). Maintaining Preparedness to Severe Though Infrequent Threats-Can It Be Done? Int J Environ Res Public Health. doi: 10.3390/ijerph17072385. PMID: 32244530; PMCID: PMC7177483.

21. Sundaram N, Schaetti C, Merten S, Schindler C, Ali SM, Nyambedha EO, et al. (2016). Sociocultural determinants of anticipated oral cholera vaccine acceptance in three African settings: a meta-analytic approach. BMC Public Health. Available from: http://www.ncbi.nlm.nih.gov/pubmed/26762151 doi: 10.1186/s12889-016-2710-0. pmid:26762151

22. WHO. (2005). Treatment of Diarrhoea. A manual for Physicians and other senior health workers. WHO press.
23. WHO. CHOLERA COUNTRY PROFILE: ZAMBIA [Internet]. Lusaka; 2011 Available from: http://www.who.int/cholera/countries/ZambiaCountryProfile2011.pdf?ua=1
24. WHO. (2010). Cholera vaccines: WHO position paper. [Internet]. Vol. 85, Weekly epidemiological record. Available from: http://www.ncbi.nlm.nih.gov/pubmed/20349546
25. World Health Organization. (2017). Cholera vaccines: WHO position paper—August 2017. Weekly Epidemiol Rec. (92).
26. ZNPHI. SITUATION Report- Cholera Zambia. 2018. No. 115 4.