

**BINDURA UNIVERSITY OF SCIENCE EDUCATION**

**FACULTY OF SCIENCE AND ENGINEERING**

**DEPARTMENT OF DISASTER RISK REDUCTION**



**Assessment of the nexus of Cholera and flooding disasters and impacts on informal settlements: case study Epworth, ward 5.**

**BY**

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**B202210B**

**A dissertation submitted in partial fulfilment of the Bachelor of Science Honors Degree  
in Disaster Management Sciences**

**Supervisor: Dr. N Chanza**

**2024**

## APPROVAL FORM

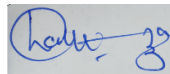
The undersigned certify that they have read the dissertation and have approved its submission for marking confirming that it conforms to the departmental requirements on a research entitled: “...*The nexus of Cholera outbreaks and flooding disasters and its impacts on the informal settlements of Epworth, ward 5...*” Submitted by **Katumba Janet Rutendo** in partial fulfilment of Bachelor of Science Honours Degree in Disaster Management Science

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## **DECLARATION**

I Janet Rutendo Katumba hereby declare that this thesis has been the result of my own original efforts and investigations and such work has not been presented elsewhere for the purpose of degree assessment. All additional sources of information have been acknowledged by means of references.



**26.9.2024**

**Signature**

**Date**

## **DEDICATION**

This research project is dedicated to my Family. In recognition of their inspiration and support to my research journey and influence on my life and work. Specifically, I would like to dedicate this research project to my mother for her unwavering support and encouragement throughout my academic career. This research project is a testament to the power of the research and the impact it can on our lives and communities. I hope that this research will contribute to the ongoing efforts to make our country a better place and make a positive difference in the world.

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Thank you all for your contributions and support

## **ABSTRACT**

In Epworth, Ward 5, Zimbabwe, flooding and cholera outbreaks are frequent calamities, especially in informal areas. This study evaluates the relationship between these calamities and the vulnerable groups they affect. Three informal communities were the subjects of a mixed-methods approach that combined surveys, interviews, and observations to gather information from 300 households. The findings demonstrate a strong relationship between cholera epidemics and floods, with the latter frequently happening after the former. The repercussions of these calamities are made worse by the inadequate infrastructure, poor sanitation, and restricted access to healthcare in the informal settlements. According to the study, these communities' vulnerability is mostly caused by poverty, illiteracy, and political unrest. The results emphasize the necessity of comprehensive approaches to catastrophe risk reduction and management that take into account the socioeconomic, and political factors that influence susceptibility. Upgrading infrastructure, enhancing healthcare and sanitation facilities, and supporting neighbourhood -based disaster planning and response programs are among the suggestions. The susceptibility of informal settlements to flooding disasters is another crucial factor to take into account. In informal settlements, poverty, susceptibility, and flood disasters are directly related, according to a study by Mfingwana (2020). These tragedies cause fatalities, collapsing homes, property loss, and loss of belongings. In summary, a multimodal strategy that incorporates public health treatments, disaster preparedness, and community resilience-building techniques is needed to address the relationship between cholera epidemics and flooding catastrophes in informal settlements. Policymakers and other interested parties can strive toward more efficient preventative and response strategies by having a better grasp of these interrelated issues.

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## **List of abbreviation**

<b>FGD</b>	<b>Focused Group Discussions</b>
<b>ELB</b>	<b>Epworth Local Board</b>
<b>SDG</b>	<b>Sustainable Development Goals</b>
<b>IHR</b>	<b>International Health Regulations</b>
<b>GTFCC</b>	<b>Global Task Force on Cholera Control</b>
<b>NTFCE</b>	<b>National Task Force on Cholera Elimination</b>
<b>CLTS</b>	<b>Community Led Total Sanitation</b>
<b>WHO</b>	<b>World Health Organization</b>
<b>NGO</b>	<b>Non-Governmental Organization</b>
<b>MSF</b>	<b>Médecins Sans Frontières</b>
<b>EFZ</b>	<b>Evangelical Fellowship of Zimbabwe</b>

# **CHAPTER 1**

## **INTRODUCTION**

### **1.1 Introduction**

The context of the study and the research problem is concerned with the issues related to cholera outbreaks and flooding disasters. These have been briefly described in this chapter. In addition to the arrangement of the study, it symbolizes the significance, goals, and research topics.

### **1.2 Background of study**

This case study, which centers on the Epworth settlement in Zimbabwe, tries to evaluate the relationship between cholera outbreaks and flooding disasters on unauthorized encampments. Due to their unstable living conditions, such settlements are particularly susceptible to such tragedies. Informal or settlements are especially vulnerable to the destructive effects of these catastrophes in many developing nations. Epworth, a peri -urban community on the outskirts of Harare, will have its vulnerability to the effects of cholera epidemics and flooding catastrophes evaluated. To examine the effects on the Epworth population, health, and socioeconomic factors, the study combines qualitative and quantitative methodologies. The results highlight the critical requirement.

### **1.3 Research problem statement**

Baudoin (2017) states that informal settlements in Zimbabwe are particularly vulnerable to flooding due to inadequate drainage systems and the encroachment of settlements into flood prone area. Cholera is a water borne disease that is closely linked to inadequate water and sanitation infrastructure, as well as poor hygiene practices. Flooding disasters are another major

concern for informal settlements as they can lead to the contamination of water sources and therefore the spread of water borne diseases such as cholera. In developing countries, including Zimbabwe, informal settlements are prone to experiencing significant health environmental challenges. Mujuru (2016) highlights the role of poor water and sanitation infrastructures contributing to the spread of cholera. This research aims to assess the relationship of cholera outbreaks and flooding disasters and its impacts on the squatter settlements, focusing on the case study of Epworth (A peri-urban area located near Harare). Understanding the relationship between cholera outbreaks and flooding disasters can help in the implementation of preventative measures to reduce the risks of cholera outbreaks during flooding events. It is also crucial for disaster management, through informing in disaster management planning and response efforts in the vulnerable communities like Epworth in this case study. The study aims to provide valuable insights into the complex relationship between cholera outbreaks, flooding disasters and informal settlements in Epworth. The findings will contribute to the existing knowledge base, enabling policy makers, local authorities, and humanitarian organizations to develop evidence-based interventions and strategies to improve the living conditions and resilience of the marginalized communities. The focus of this problem through understanding the relationship between cholera outbreaks and flooding disasters can help in implementing some preventative measures to reduce the risk of cholera transmission during flooding events. It is also important for Disaster management where there will be informing the disaster management planning and response efforts in Epworth. The present concern on this research is of public health impact, where cholera and the combination of flooding and inadequate sanitation can exacerbate the spread of the disease. There can also be adaptation to climate change, as it leads to the frequent and extreme weather events, including floods. The need to understand the intersection of environmental risks and health impacts. However there can be climate change adaptation measures that can prioritize public health in areas like Epworth.

#### **1.4 Rationale**

Vulnerability to cholera outbreaks and flooding disasters in Epworth, a densely populated settlement located near the capital city Harare has experienced multiple cholera outbreaks in the past. The prevalence of inadequate sanitation facilities, poor waste management and limited

access to clean water sources in settlements like these in Epworth make them highly susceptible to cholera transmission.

High risks of flooding disasters in Epworth make them highly susceptible to cholera transmission. High risks of flooding disasters in Epworth are mainly because it is situated in a flood prone area, and its residents are exposed to recurrent flooding events, particularly during the rainy season

The lack of proper drainage systems, insufficient housing infrastructures, and encroachment of flood plain exacerbate the vulnerability of the settlements of floods. Investigating the impacts of flooding disasters in Epworth can shed light on the consequences of such events on illegal settlements and identify strategies for mitigating their effects.

## **1.5 Aim**

The aim of this study is to understand the connections linking cholera and flooding disasters and their effects on informal settlements of Epworth.

## **1.6 Objectives**

- i. To investigate the relationship between flooding events, the occurrence and spread of cholera in the illegal settlements.
- ii. To assess the spatial and temporal patterns of flooding and their correlation with cholera cases.
- iii. To identify the perceptions and responses to cholera outbreaks and flooding disasters.
- iv. To outline the underlying factors contributing to the vulnerability of informal settlements to cholera outbreaks and flooding disasters in Epworth.

## **1.7 Research questions**

- i. What is the relationship between flooding events, occurrence and spread of cholera in the squatter settlements found in Epworth?

- ii. What are the spatial and temporal patterns of flooding and their correlation with cholera cases?
- iii. How do residents in informal settlements perceive and respond to cholera outbreaks and flooding disasters?
- iv. What are the underlying factors contributing to the vulnerability of informal settlements to cholera outbreaks in Epworth?

## **1.9 Definition of terms**

- Cholera: an infectious disease that is caused by the bacterium *Vibrio cholerae*. It is typically transmitted through contaminated water or food and can lead to severe diarrhea and dehydration. It is associated with poor sanitation and hygiene conditions WHO (2021.)
- Flooding disasters: these refer to the events where an area becomes inundated with water, resulting in significant damage, loss of life, and disruption of normal activities. Flooding disasters can occur due to heavy rainfall, river overflow, storm surge and other factors. They can lead to property destruction, displacement of populations and increased health risks UNDRR (2019.)
- Informal settlements: also known as slums, are residential areas that are established without legal authorization on land that is owned by someone else or without adhering to urban planning regulations. These settlements often lack basic infrastructure and services, such as proper housing, sanitation and access to clean water. They are inhabited by marginalized populations with limited resources and legal protection UN (2003).

## **1.10 Methodology**

### **1.10.1 Research design**

There is use of qualitative approach for comprehensive understanding. Qualitative methods involving surveys and structured questionnaires to collect data on the prevalence of cholera, flood related incidents, housing conditions and access to basic services. Qualitative methods

also involving interviews, focus group discussions, and observations to explore the lived experiences, perceptions and coping strategies of the residents.

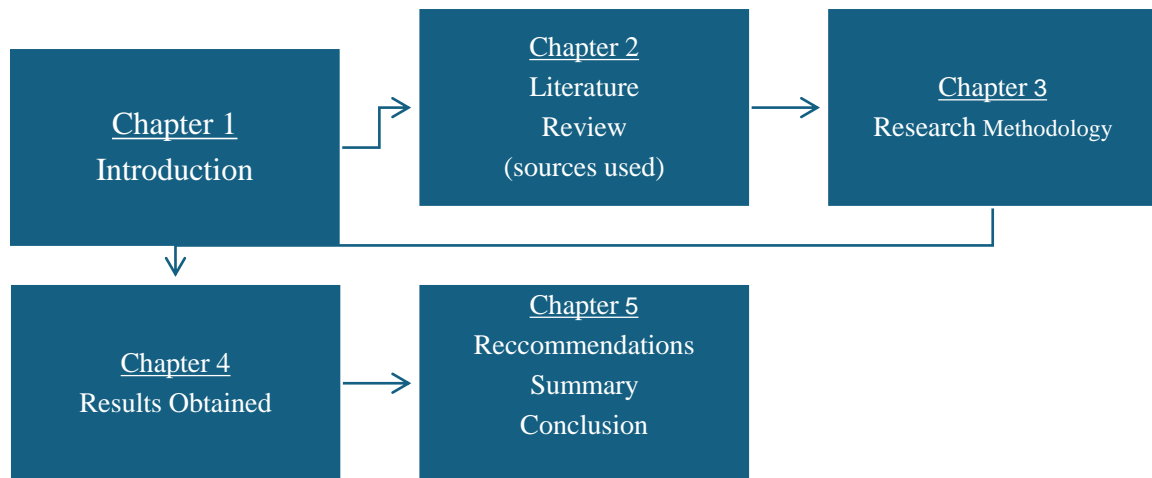
#### **1.10.2 Data collection**

There will be conduction of household surveys to gather quantitative data, administrative to the relevant stakeholders such as health care clinics to gather data on outbreak history and response mechanisms. There will be conducting of interviews to collect data on the residents' experiences, coping strategies and perceptions related to flooding disasters and cholera outbreaks. There will also be field observations to document the physical features, infrastructure and environmental conditions of the settlement.

#### **1.10.3 Data analysis**

There will be analysis of qualitative data to identify the patterns and relationships that exist between cholera outbreaks and flooding disasters. There will be Narrative analysis of qualitative data where there are interpretations of stories and experiences. The approach involves identifying narrative arcs and language patterns of the residents. Triangulation of the qualitative findings will be used to find a comprehensive understanding of the nexus between cholera outbreaks and flooding disasters in squatter settlements.

## 1.11 Organization of study



*Figure 1.1: organization of study Primary source (2024)*

Each of the five chapters that make up the research project adds to the overall smooth projection of the project. The key components of the research, including the introduction, study background, goals, objectives, research questions, research problem, definition of terminology, and study organization, were introduced in Chapter 1. The second chapter will be a review of the literature, in which the value and continuity of earlier studies will be highlighted. Knowledge gaps will be identified through the use of secondary sources and filled. The topic of research methodology will be covered in Chapter 3, which includes research tools, participant selection, data collecting, and data analysis. The presentation and analysis of data will be covered in Chapter 4. Chapter 5 will give an overview of the conclusion and recommendations on the impacts of cholera and flooding disasters on informal settlements in Epworth and the possible interventions that can be put into play.



## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

Literature review is an account of what has been researched and published on the topic by other scholars and publishing houses. This section intends to explore on the other works by other schools of thought. The purpose of the literature review is to situate the research in the context of what is already known about the causes of informal settlements and the consequences. According to Nerderir (2010), literature review refers to the course of interpreting, scrutinizing, and assessing and summarize theoretical information related to a certain topic response to cholera outbreaks in Epworth, health authorities, non-governmental organizations, and the local community have offered medical care, encouraged good hygiene, and pushed for better infrastructure for water and sanitation in order to stop outbreaks in the future.

#### **2.2 Theoretical framework**

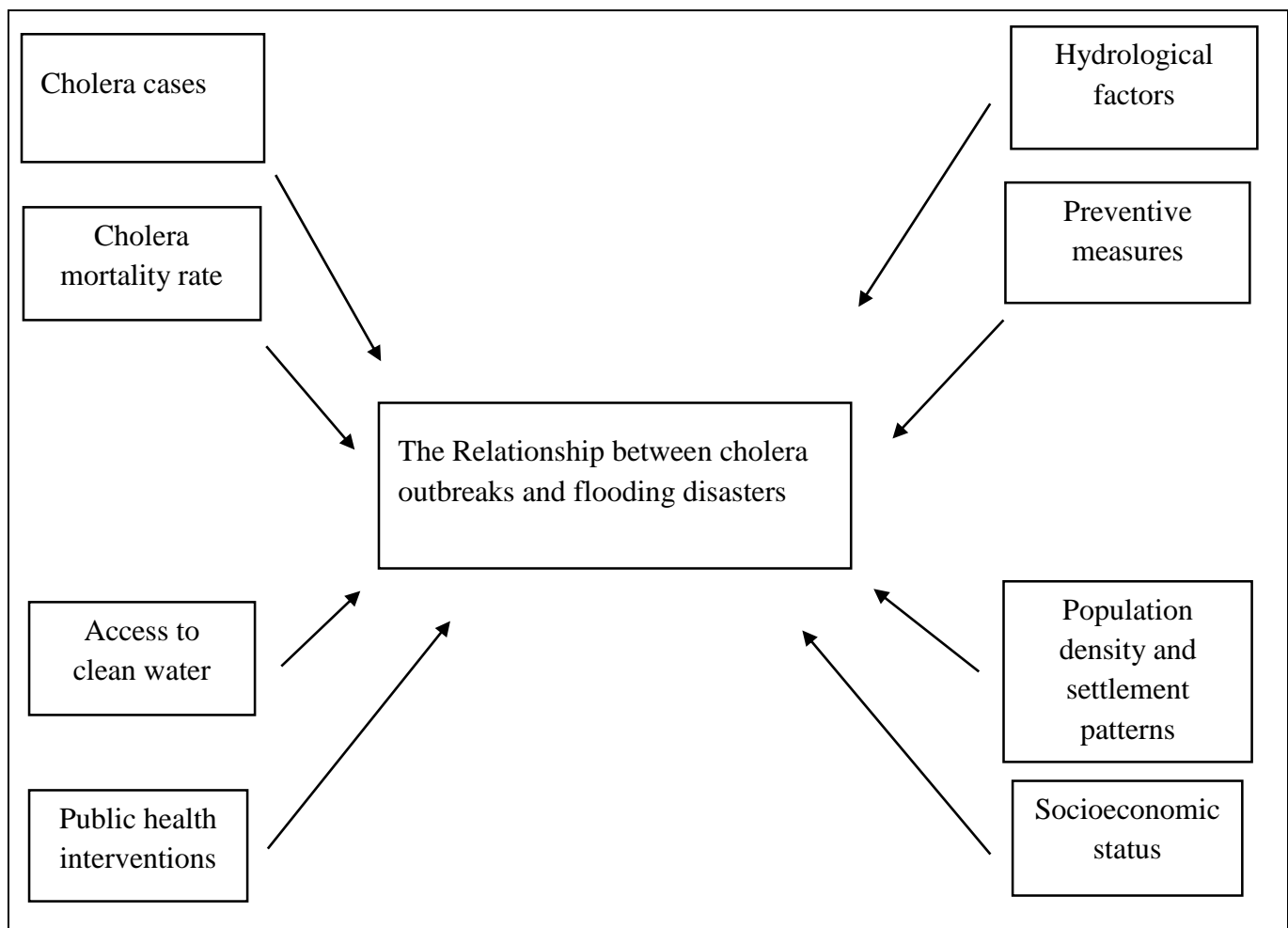
##### **2.2.1 Vaccination program**

In cooperation with UNICEF and the World Health Organization (WHO), the Government of Zimbabwe initiated a vaccination program against cholera. In the presence of Professor Jean-Marie Dangou of WHO and Dr. Tajudeen Oyewale of UNICEF, the first cholera vaccines were administered by Honorable Minister of Health and Child Care Dr. Douglas Mombeshora during an event held in Kuwadzana, one of the areas most affected by the current outbreak. The Vaccine Alliance (GAVI), whose dedication to global health equity has been crucial in granting Zimbabwe access to life-saving immunizations, provided financial support for these vaccines.

The government of Zimbabwe is implementing cholera vaccines as an extra tactic to stop the disease's spread.

## Zimbabwe Sectorial Cholera Elimination

### 2.3 Conceptual framework



*Figure 2.1 Conceptual Framework*

The figure above, (see figure 2.1) shows dependent and independent variables are highlighted in this model to emphasize the connection between cholera outbreaks and flooding disasters. Environmental factors that increase the pathogen's prevalence in the ecosystem, such as hydrological parameters, impact an individual's susceptibility to acquiring *Vibrio cholerae* and becoming a host. The regional authorities' and humanitarian organizations' implementation of emergency response plans and preventative measures. To decrease the effects of cholera epidemics due to flooding, this involves initiatives including public health education

campaigns, water treatment upgrades, and cholera vaccination campaigns. The virulence of the particular cholera strain, health care delivery, and several other upstream factors all have an impact on overall mortality rates. The government has a significant role in providing people with health care of the specific cholera strain among others. The government has a major role in providing individuals with health care, safeguarding human rights, and building infrastructure.

## **2.4 Empirical Literature**

### **2.4.1 Cholera outbreaks in Zimbabwe**

Flooding disasters are a major problem faced by residents in Zimbabwe's urban poor settlements. Seasonal cholera outbreaks driven by these disasters cause severe health problems and death. These outbreaks have gradually increased in severity and frequency since 1999, with Zimbabwe recording major outbreaks in 2002 to 2003, and then 2008 to 2009. More than 4,000 people died in the latter outbreak, which also affected neighboring countries. Up to date, the December 2018 outbreak in Harare is one of the worst outbreaks with 49,411 reported cases and 1,830 deaths. Harare is the capital city, but unlike other major cities, it still exhibits the historical pattern where the cholera casualty is concentrated in the high-density suburbs. This is so because the city has the oldest infrastructure in the country characterized by water systems that are now dilapidated and unhealthy. The first patient with cholera in Zimbabwe was reported in the town of Chegutu, located about 100 kilometers southwest of the capital Harare. According to IFRC (2024) throughout 2023, the numbers have only increased, as the disease spread to all the country's ten provinces,

### **2.4.2. Impacts of flooding on informal settlements in Zimbabwe.**

Flooding in informal settlements in Zimbabwe can have significant impacts on various aspects of the community, including loss of Lives and Injuries. Floods can result in the loss of lives and injuries, especially in densely populated informal settlements where housing structures may not be built to withstand floodwaters. Floodwaters can cause damage to homes,

infrastructure, and possessions, leading to financial losses for residents who may lack insurance coverage or resources to recover. Flooding in informal settlements in Zimbabwe can have significant impacts on various aspects of the community. Floods can result in the loss of lives and injuries, especially in densely populated informal settlements where housing structures may not be built to withstand floodwaters.

Floodwaters can contaminate drinking water sources, increase the risk of waterborne diseases such as cholera and typhoid, and create breeding grounds for mosquitoes, raising the risk of vector-borne diseases like malaria and dengue fever. Flooding can disrupt economic activities in informal settlements, such as small-scale businesses and informal markets, leading to loss of income and livelihoods for residents who rely on these activities for survival. Addressing the impacts of flooding on informal settlements in Zimbabwe requires a multifaceted approach that includes improved urban planning, infrastructure development, early warning systems, community preparedness, and access to basic services such as clean water, sanitation, and healthcare.

Addressing the impacts of flooding on informal settlements in Zimbabwe requires a multifaceted approach that includes improved urban planning, infrastructure development, early warning systems, community preparedness, and access to basic services such as clean water, sanitation, and healthcare.

#### **2.4.3. Nexus between cholera and flooding disasters**

The connection between cholera outbreaks and flooding disasters in Zimbabwe is significant. Flooding often leads to the contamination of water sources, creating an environment conducive to the spread of waterborne diseases like cholera. The recent reports highlight this nexus where an article titled "In Zimbabwe Disaster at the intersection of Cholera and Climate Change" discusses how climate change has increased the frequency of floods and droughts in Zimbabwe, which are linked to repeated cholera outbreaks. It mentions that since 1998, Zimbabwe has recorded yearly cholera outbreaks, with significant surges following Cyclone Freddy in February 2024.

Cholera is an acute diarrheal infection caused by ingestion of food or water contaminated with the bacterium *Vibrio cholerae*. There are assumptions here that weather shocks such as extreme rainfall, droughts and flooding can affect human health (i.e. cholera prevalence) both directly (through higher exposure to the bacteria, for instance), and indirectly (due to the negative income-shocks that may arise through Cholera, a waterborne disease, thrives in unsanitary conditions often exacerbated by flooding, posing a significant health risk to residents of informal settlements).

Informal settlements like Epworth are often located in hazard-prone areas with inadequate water and sanitation facilities, making residents more susceptible to waterborne diseases during floods. Findings from the assessment can inform policy formulation and governance frameworks related to disaster risk reduction and public health. It can advocate for better urban planning, infrastructure development, and inclusive policies to address the vulnerabilities of informal settlements. The assessment aligns with SDG 3 (Good Health and Well-being) by addressing health risks associated with cholera outbreaks. It also intersects with SDG 11 (Sustainable Cities and Communities) by focusing on improving conditions in informal settlements. By conducting an assessment on the nexus between cholera outbreaks, flooding disasters, and their impacts on the informal settlements of Epworth in Zimbabwe, it is possible to generate valuable insights for public health, disaster management, and community resilience efforts. The findings can guide targeted interventions, inform policy decisions, and contribute to the holistic development and well-being of vulnerable populations in informal settlements. This topic holds significance not only for localized responses in Epworth but also for broader implications in disaster management, public health, and urban development strategies.

Understanding and addressing the intersecting challenges of cholera outbreaks, flooding disasters, and informal settlements are crucial steps towards building a more resilient, inclusive, and sustainable future for all residents. Epworth, like many informal settlements in Zimbabwe, has experienced sporadic flooding due to its location in low-lying areas and inadequate drainage systems. These floods can result from heavy rainfall during the rainy seasons.

Floods have historically impacted Epworth's informal settlements, causing interruptions to everyday life, infrastructural damage, population displacement, and elevated health concerns from tainted water and unsanitary surroundings. Following floods, local residents, non-governmental organizations, and governmental bodies have contributed to the provision of

emergency aid, provisional housing, and endeavors to reinstate essential services to impacted regions.

In Zimbabwe, particularly in places like Epworth where poor access to water and sanitary facilities contributes to the spread of waterborne illnesses, cholera outbreaks are a persistent worry. In Epworth, cholera outbreaks have resulted in a rise in hospital admissions, fatalities, and incidences of gastrointestinal illnesses, especially for vulnerable groups residing in unofficial settlements with inadequate access to hygienic conditions and clean water. In

## **2.5 Research gap analysis**

Affected areas have to contend with the contamination of their food and water sources by flood waters, increasing the risk of contracting the disease. Floods have a devastating impact on any cholera program implemented and the fight to control cholera in the affected areas. It is crucial for the Zimbabwean government and its stakeholders to appreciate the close relationship between cholera outbreaks and floods and then adopt an integrated and comprehensive flood management approach in their response to future outbreaks of cholera.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

The primary purpose of this chapter is to outline the Research Methodology that was applied in this specific study, which examines the connection between cholera and flood outbreaks and the effects they have on Epworth, ward 5, Harare Province's informal settlements. The goal of the chapter is to support the selected research design, data gathering techniques, methodology, and ethical issues and how they were carried throughout the research

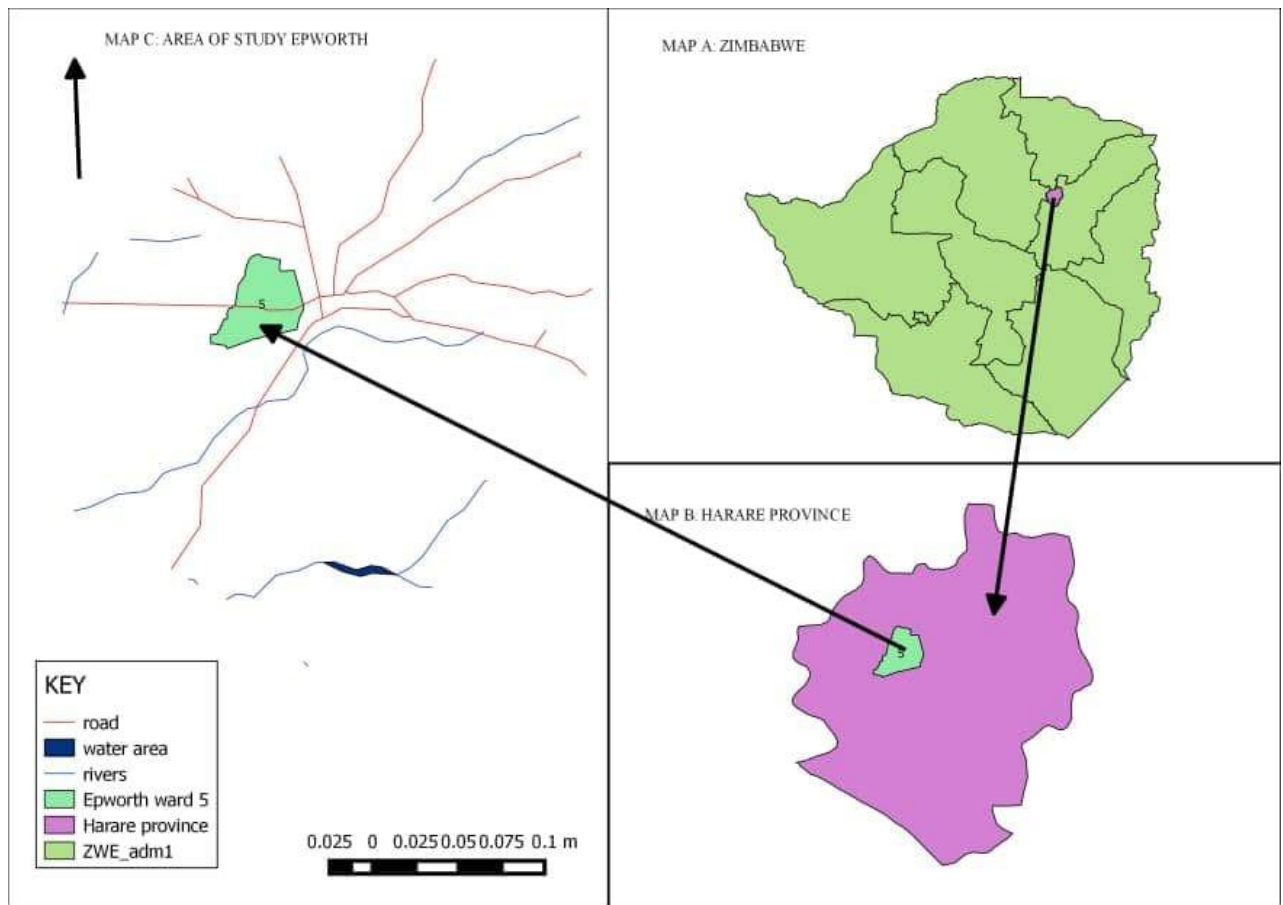
#### **3.2 Research Design**

According to Ormrod (2018), a research design is a detailed plan or framework outlining the methods and procedures that will be used to conduct a research study. The researcher employed qualitative methods such as in-depth interviews, focus group discussions and surveys. The surveys were conducted to a specific sample of the population to collect valuable responses which would attend to the purpose of the research. By employing these methods, the researcher was able to gain a deeper understanding on the experiences of individuals affected by cholera outbreaks in the informal settlements.

#### **3.3 Study Area**

The province of Harare is home to the Epworth constituency. Stopover, Zinyengere, Pentagon, Magada, Overspill, Maulana, Donhororo, Munyuki, and Danastein are among the areas that make up this region. It is located 12 kilometres to the southeast of the Harare Central Business District. Because the constituency is on the outskirts of Harare, the majority of its settlements are shacks and shoddily constructed homes. The region has long been plagued by issues such as inadequate or non-existent road service, sewage reticulation, and lack of water supply. The area is home to the majority of the City's newest residents who are looking for better opportunities and has high rates of youth unemployment. Because of this, the area's main economic activity includes street vending, informal manufacturing, as well as purchasing and selling goods from neighbouring nations on the black market. Epworth is a suburb that consists of both formal and informal settlements. The informal settlements have arisen due to an influx of people who were rendered homeless by an informal settlement destruction operation codenamed Murambatsvina (operation restore order) in 2005 as well as the political situation that was experienced in Zimbabwe in the first decade of the 2000s (Ncube and Phillip, 2006 and UN Habitat, 2009)..





**Figure 3.1** Map showing Epworth Ward 5 location. Primary source (2024)

The figure shown above (See Figure3.1), is the location of the Harare Metropolitan Province composed of the Harare urban and Epworth. (a) Zimbabwe district boundaries depicting the Harare Metropolitan Province; (b) districts of Harare Metropolitan Province; (c) Epworth district showing water sources surrounding the area.

### 3.4 Targeted population

Relevant data was gathered in order to choose the demographic for this specific study project. The targeted population in this instance were the residents of Ward 5, in Epworth. A unified set of research techniques that can assist researchers in addressing the problems that arise among communities who are challenging to reach due to their ensuing lack of visibility is

provided by targeted populations, claim Watters et al. (1989). However, this helped in the process of choosing the research participants that would provide in depth information.

### **3.5 Sample size**

Sample size refers to the number of observations or individuals that are included in the research study, according to, Araujo (2019). The researcher conducted thorough review of the relationship that exists between cholera outbreaks and flooding disasters in Ward5, and the impacts of cholera on the informal settlements.

### **3.6 Sampling Techniques**

Sampling techniques are the methods used to select participants for a study. To select respondents in Epworth, a random sample was used. A random sample was used in Epworth due to the informal haphazard nature of settlement in the suburb. The researcher used the random sampling technique to ensure that each resident in the ward had an equal chance of being selected for the study, which according to Barreiro (2014) would minimize bias and increase the generalizability of the data collected. It is the nonprobability based equivalent of the stratified random. This resulted in a total sample of 20 respondents being selected randomly.

### **3.7 Data Collection methods**

In this qualitative research, the scholar purposefully selected respondents that can provide information relating to the phenomena under investigation. Landman (2006) says, “Qualitative research is not based upon a fixed set of rigid procedures, but nevertheless the researcher does need to develop a set of strategies and tactics in order to organize, manage and evaluate information.” questions in a questionnaire. To gather comprehensive data concerning the relationship between cholera and flooding disasters, the researcher engaged a multiple number of data collection methods that include surveys, focused group discussions and interviews.

#### **3.7.1 Data Collection tools**

The researcher used the following research tools; Interview guide, survey guide and Focus Group Discussion Guide for data collection.

### **3.7.2 Focus Group Discussions Focused Group Discussions (FGDs)**

A qualitative research method, namely; focused group discussions were employed by the investigator. Participants from the community who resided in unofficial settlements were mobilized. Creswell (2013) asserts on how the conversations were guided in a way that encouraged participation and gave participants a platform to share their experiences, opinions, and knowledge on cholera and flooding disasters. The concentrated group discussions guide's multiple-choice questions served as the main focus of the sessions (see Appendix 3). They promoted participant engagement, which encouraged the possibility of more detailed data as individuals built upon and responded to each other's contributions. FGDs were employed to gather community viewpoints regarding the consequences of flooding and cholera in Epworth, Harare, in addition to the effectiveness of current interventions and suggestions.

### **3.7.3 Interviews**

During the interviews, the scholar also asked open ended questions to explore the experiences and perceptions of the residents concerning the relationship between flooding disasters and cholera anInterviewing is a qualitative research method that gathers in-depth data from individuals or groups about their experiences, opinions, attitudes, and behaviours. Residents of Ward 5 of Epworth's informal settlement participated in interviews. Personal narratives from the interviewee were provided by direct communication between the researcher and the participant, which made it easier to thoroughly investigate issues of interest. The researcher adhered to ethical guidelines, such as getting participant agreement and protecting the privacy of the information discussed in the interviews, to assure the validity of the study Denscombe, (2017). The researcher conducted a semi-structured interview, adhering to the interview outline (see to Appendix 1) but giving room for flexibility to investigate topic replies that were not expected.

### **3.7.4 Surveys**

According to Schilling (2013), surveys are research techniques that gather information from a sample of people or groups in order to comprehend their beliefs, actions, or traits. These were employed in order to collect data regarding the incidence of cholera in the Epworth community as well as the effects of flooding disasters on the unofficial communities. Numerous methods were used to conduct the surveys, including in-person meetings and the use of questionnaires. In order to shed light on the relationship between the two phenomena, structured data was gathered via a structured questionnaire that the researcher created (See Appendix 2).

### **3.8 Data Analysis**

Following the data collection, the scholar following Jones (2019) analysed the survey responses to identify the common themes, patterns, and challenges related to cholera outbreaks. The researcher transcribed the audio recordings from interviews and FGDs precisely. This ensured that all data was available for in-depth analysis. The researcher conducted thematic analysis, to identify recurring themes and patterns. To enhance the validity of the findings, the researcher triangulated data from surveys, interviews, and FGDs. This involved comparing and contrasting data from different sources to identify converging lines of evidence. The integrated findings were interpreted in the context of existing literature on cholera, flooding, and informal settlements. This helped to situate the study within the broader body of knowledge and identify unique contributions.

### **3.9 Ethical Considerations**

An informed consent form was provided to research participants, (See Appendix 4), which they signed after being given a clear explanation of the study's purpose from Neuman (2020). The research aim was also explained to all respondents, and this was done to ensure that no individual included in the study could be victimized. Informed consent, according to S., means that both the researcher and the respondents agree to participate and provide information without being forced to do so. The researcher upholds the principle of confidentiality throughout, and participants are ensured. The names of the respondents are kept private, and no one is permitted to write their names on research instruments. This was done in order to respect all issues to do with privacy. In this research, the names of the researcher, purpose and benefit of the study were not disclosed

### **3.10 Limitations**

Given that they frequently use closed-ended questions and predetermined response possibilities, surveys may not have the depth and richness of other qualitative methods like observations or interviews. Unreliable data can result from respondents giving false or biased answers because of things like acquiescence bias, social desirability bias, or misinterpreting the questions. If the sample is not typical of the target population, surveys may be biased towards sampling, which would limit how broadly the results may be applied. Inadequately crafted survey questions that contain leading or unclear language have the potential to undermine the validity and reliability of survey results. Low response rates to surveys are possible, especially if participants feel they are burdensome or irrelevant. This can cause non-response bias and potentially skew the results. The discussion and results might be strongly impacted by the facilitator's abilities and prejudices. Groupthink is a risk in which people suppress dissenting perspectives by conforming to the expressed majority viewpoints. The qualitative data from focus group discussions (FGDs) might be difficult to analyse and may

call for specific knowledge. It's possible that the small sample size isn't typical of the general public.

The purpose of this chapter was to validate how the researcher intended to collect data from the target population. As such the research philosophy and design, sampling techniques, size and methods were elaborated. Data collection methods, presentation, analysis and ethical considerations were also elaborated. The following chapter will present and analyse the collected data.

## **CHAPTER 4**

### **RESULTS AND DISCUSSION**

#### **4.1 Introduction**

This chapter presents data, analyses it and discusses the emerging research findings as is guided by the research objectives and research questions. The findings focus on the relationship between flooding disasters and cholera outbreaks in Epworth Harare, Zimbabwe.

#### **4.2 Data collection process**

Ward 5 of Epworth was the site of surveys and interviews, and the people living there participated in answering the questionnaires. This setup was purposefully chosen in order to gather the much-needed data on the correlation between cholera outbreaks and flooding disasters and its effects on the chosen sample size of ward 5 (Epworth).

There were 20 respondents in the ward 5 of Epworth area. The respondents residing in the area comprised of more males. According to the 2022 Census Report Zim Stat (2022), Epworth's Ward 5 had a total of 9 056 females and 8 490 males. This makes a total of 17 546 people in one ward out of seven wards. Most of the respondents were able to communicate and understand issues regarding to the impacts of flooding such as Cholera. As observed in literature, the Epworth area largely comprises informal settlers who have illegally occupied land DSHZT (2009). These informal settlements extend to wetlands in the area thereby leaving them exposed to severe impacts of flooding. This is because the wetlands were some of the previously unoccupied pieces of land. The residents abstracted sand from the wetland for construction of their own houses. Some of the extracted sand was sold to locals who were building in Epworth. A study carried by Chirisa (2010) shows that different communities thrive from their surrounding environment but to an extent of exploiting the existing resources to their

exhaustion. This is a common scenario in Epworth especially considering the demand for space.

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#### **1.4 Interview response rate**

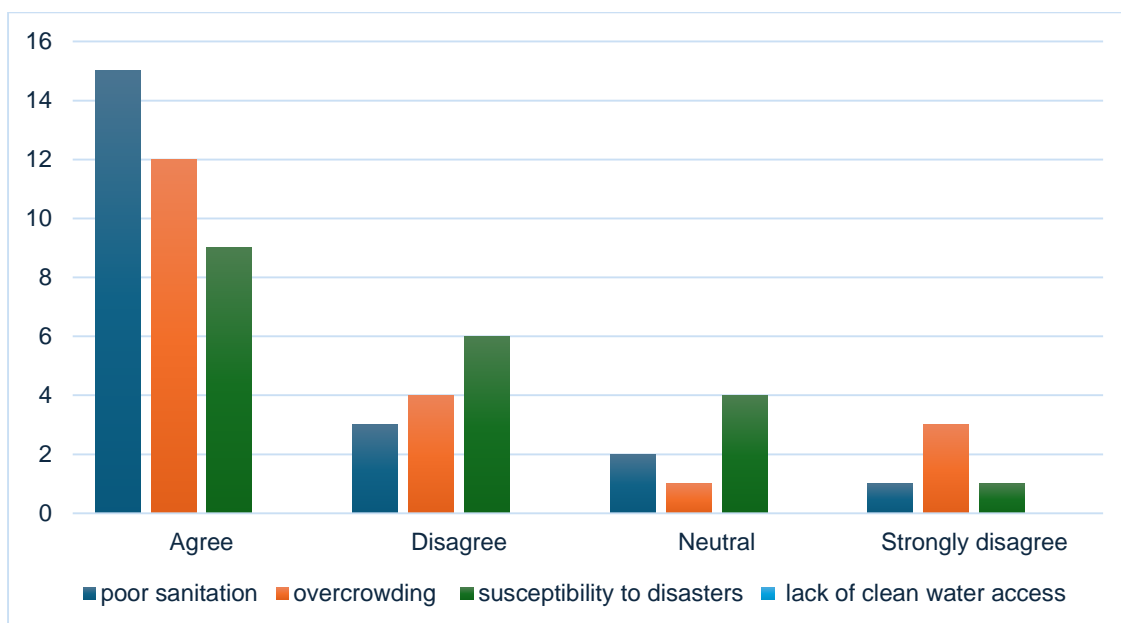
In order to collect data for the study, interviews were also held in both wards 5. Primary data was acquired efficiently, requiring less time to conduct the interviews. Since the interviews allowed the researcher the time and chance to ask more questions, (See Figure 4.1), and seek clarification in order to get the pertinent information, in-depth information was also obtained from the settlers. It was also possible to learn distinct perspectives from respondent responses through interviews. Interviews were conducted using convenience sampling. Twenty settlers were interviewed by the researcher with a sample size of one. The settlers the researcher questioned were those who were discovered at that time on their homesteads. This table displays the response rate to interviews.

<b>Group</b>	<b>Sample size target</b>	<b>Participants</b>	<b>Response percentage</b>
Ward5	10	9	90%

*Table 4.1 Interview response rate primary source (2024)*



## 2.4 Survey results



*Figure 4.1 Survey results*

The factors leading to vulnerability which were used in the survey are shown in the figure above, (see figure 4.1). A survey was carried out in order to identify the vulnerabilities that the residents of ward 5 in Epworth are exposed to and their responses to the factors that

contribute to their vulnerabilities. The above table presents the ward's responses on the factors that include; poor sanitation, lack of access to clean water, overcrowding and susceptibility to disasters. The survey guide required that the researcher asks questions concerning their opinions concerning the factors that contribute to vulnerability. 20 people that reside in this ward participated in the survey, with seven of them being highly educated. The outcome of the responses proved that Epworth is exposed to cholera outbreaks in times of floods due to lack of proper sanitation and basic services through infrastructure destruction. The responses were also followed by



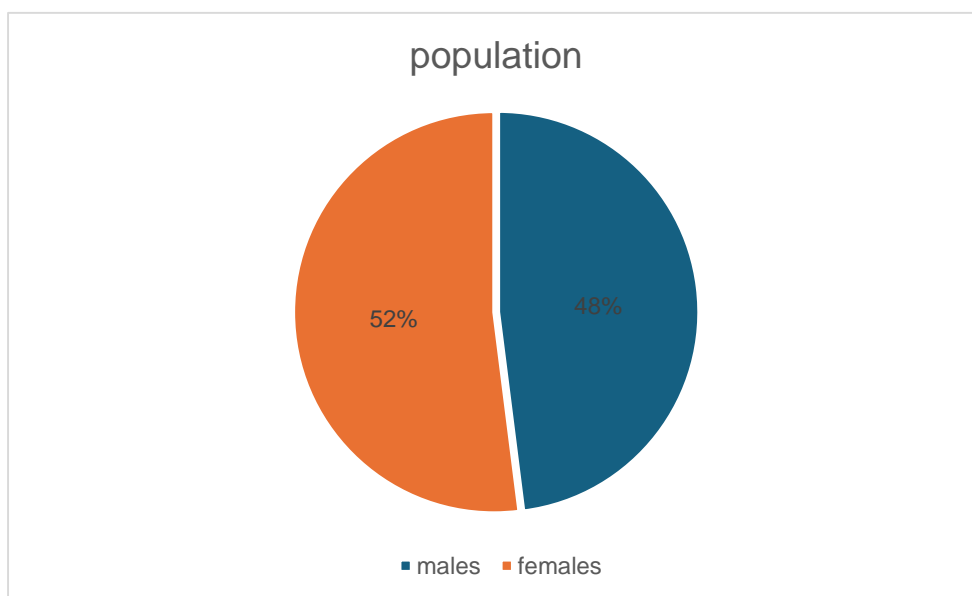
*Figure 4.2 Destruction of Infrastructure in Epworth due to floods in 2023(primary data 2023)*

### **3.4 Focused Group Discussions response rate**

From the FGDs, it emerged that the health of the shanty dwellers in Epworth was very precarious because of the poor sanitation services. As a result, residents were exposed to water borne diseases such as cholera and typhoid. In one of the FGDs, a woman residing in the area indicated that there was only one borehole serving more than 150 households. Pressure on this borehole was forcing residents to dig up unprotected open wells in their compounds posing a potential health risk. One participant indicated that his family had suffered from stomach problems soon after moving in to settle in Epworth as they were exposed to water borne

diseases as they were fetching water from an open well near their house. For residents' access to health care facilities was cited as a major challenge.

### 4.3 Demographic profile of Ward 5 Epworth



*Figure 4.2 The population of ward 5*

Males predominated in most families where interviews were performed, and women would submit to men in order to participate in the interviews, which explains why there were more men than women. Women's involvement shown that they are impacted by the rise of informal settlements as well as having a say in its causes and effects. Noting that patriarchy still persists and is entrenched in our communities, women must be empowered in order for them to assume leadership roles in all spheres of life.

#### **4.4 Vulnerability factors that were used to conduct a survey in Ward 5 Epworth**

##### **4.4.1 Lack of access to basic services**

The likelihood of cholera epidemics and flooding disasters, which have increased in frequency as a result of climate change, is increased by this. Accessing essential amenities including clean water, sanitary conditions, and medical attention is extremely difficult in Epworth Ward 5, a peri-urban settlement located in Zimbabwe, Mavhunga (2020). This lack of basic services exacerbates the risk of cholera outbreaks and flooding disasters, which have become more frequent due to climate change, Mukonambi (2022). Epworth Ward 5 cholera epidemics are frequently brought on by tainted water supplies and inadequate sanitary facilities. Waterborne illnesses like cholera are more likely to spread when people lack access to clean water and adequate waste management facilities). Inadequate drainage infrastructure and subpar urban design contribute to the region's flooding tragedies from Moyo (2021). Flooding brought on by ineffective drainage infrastructure taints water supplies and raises the possibility of contracting waterborne illnesses. The problem is made more challenging by the area's restricted access to healthcare services in the event of a pandemic or outbreak, for locals to obtain prompt medical assistance.

##### **4.4.2 Susceptibility to disasters**

According to UNICEF (2020), the majority of residents in Epworth Ward 5 live in poverty, with limited access to resources, making them more vulnerable to disasters. The area is characterized by overcrowding and poor housing, increasing the risk of disease transmission and flood damage. Epworth lacks proper drainage systems, water supply, and sanitation infrastructure, making it prone to flooding and waterborne diseases. Residents have limited access to healthcare services, making them more susceptible to the impacts of disasters. The area's proximity to a river and poor waste management practices increase the risk of flooding and water contamination. The area is vulnerable to the impacts of climate change, such as

increased frequency and severity of flooding and droughts IPCC (2020). Furthermore, social and economic factors such as lack of education, unemployment, and political instability increase the vulnerability of residents to disasters.

#### **4.4.3 Overcrowding**

Because people living in close proximity to hazardous water sources are obliged to live there, overcrowding contributes to the spread of waterborne diseases like cholera. The risk of disease transmission rises when poor sanitation makes it harder to maintain good hygiene and sanitation practices. The development of informal settlements in flood-prone areas raises the risk of flooding and contaminates water supplies. Residents find it challenging to get prompt medical attention in the event of an outbreak or disaster because to the limited access to healthcare services Ministry of Health (2020). Overcrowding makes social and economic problems worse by causing unemployment, poverty, and political unrest, which makes locals more vulnerable.

#### **4.5 Community perception and response**

One of the primary concerns raised by people living in Epworth's informal community was limited access to social services. There were multiple accounts of Epworth residents not being able to access medical resources. This was the situation because residents noticed that shantytown residents had difficulty accessing medical facilities because obtaining health care required demonstrating identification of residency. According to the community's responses on the survey carried out, one of the residents from the informal settlements said

*“Dai hurumende yatendera kuti tiwane mushonga, nemapiritsi emvura muno nekuti hatina mari, uye itibatsirene dzimwe nzira yekuti chirwere chisaapararire”. (The Government should allow that we are given medicine and chlorine pills for free, because we don't have money, and also provide other means to reduce the spread of the disease)*

They should implement their emergency response plan, which entails locating vulnerable populations, erecting makeshift shelters, and supplying needs like food, water, and sanitary facilities.

According to the WHO, the community ought to use CLTS, a strategy that lowers the likelihood of cholera epidemics by empowering communities to take charge of sanitation and hygiene practices. To lessen the effects of floods, the community should put in place flood mitigation techniques such as sandbags, drainage systems, and early warning systems. Additionally, Ward 5 responses indicated that the establishment of cholera treatment facilities, the distribution of oral cholera vaccinations, and door-to-door case searches should be the local health authority's quick response to cholera outbreaks. In the event of flooding, the local government should launch search and rescue operations, give impacted residents food and shelter, and restore essential utilities like water and sewage.

#### **4.6 The structures put in place to reduce the impacts of cholera outbreaks and flooding disasters**

To confront the cholera epidemic and the unhygienic circumstances threatening the public's health, a government-led strategy is required. One long-term strategy the Harare City Council developed to combat cholera is the Cholera Elimination Strategy. The multi-sectorial approach to cholera control in Harare is a feature of the Cholera Elimination Strategy, which aims to tackle the infrastructural and urban planning challenges that fuel the virus's spread. The goal of eliminating cholera from Harare by 2028 is in line with the Global Strategy of Eliminating Cholera by 2030.

Secondly, the strategy incorporates emergency response strategies to halt the spread of cholera in the case of an outbreak. Economic expansion along with broad access to potable water and rudimentary sanitary facilities are necessary for the long-term avoidance of cholera. One strategy to address environmental situations is to implement tailored, long-term sustainable WASH solutions to ensure the use of safe water, basic sanitation, and decent hygiene practices.

In addition to preventing cholera, these actions also help achieve goals related to hunger, poverty, and education as well as a number of other water-borne illnesses. The Sustainable Development Goals (SDG 6) and WASH cholera solutions are complementary.

Communities and individuals are engaged in the process of developing and implementing programs. Promoting actions such as hand washing with soap, handling food preparation and storage with caution, and properly disposing of children's waste are contingent upon the practices, beliefs, and culture of the community. In order to prevent guests from contracting cholera, funeral practices may need to be modified. Community involvement is sustained throughout the outbreak response through enhanced education about potential risks, symptoms of cholera, preventative actions, where and when to report cases, and the importance of seeking immediate medical assistance when symptoms appear. In order to establish programs that address needs, such as where and when to obtain care, community participation is crucial.

Vulnerabilities in the present approaches of addressing the issues related to cholera outbreaks. The region's ongoing political unrest, violence, insecurity, and significant population movements put strain on the already inadequate social services (such as water and sanitation), raising the possibility of cholera epidemics. The danger of cholera transmission and dissemination is further increased by behaviours used during religious rites. Another important challenge is the lack of adherence to the IHR (2005) obligation of declaring and reporting cholera outbreaks. Some countries have tended to avoid declaring cholera outbreaks preferring instead to report AWD, and this undermines the spirit of IHR (2005) of declaring and reporting disease outbreaks. Governments' denial of cholera outbreaks often results in non-disclosure of laboratory test results and the deliberate underreporting of cases, with inadequate control measures being instituted. Consequently, the frequency and severity of cholera outbreaks in the region have risen significantly in recent years, affecting millions of vulnerable populations.

## **4.7 Summary**

From the findings, it is evidently showing that there is a relationship between cholera outbreaks and flooding disasters due to lack of access to basic services after a flood has occurred. It was identified that there is improper disposal of waste and use of contaminated water, therefore leading to the spread of cholera outbreaks. The study also identified the causes and consequences of illegal settlement inward 5 of Epworth. The chapter presented, analysed and discussed research findings. It is also discovered that the main causes of illegal settlement are poverty, migration, politics as well as ineffective housing policies. However, regularisation of these settlements and provision of affordable housing options were seen to be more effective than relocation, enhancing access to basic services and implementing strict penalties for illegal settlement in addressing the challenges faced by residents.



## **CHAPTER 5**

### **CONCLUSION AND RECCOMENDATIONS**

#### **5.1 Introduction**

This chapter provides an overview, a conclusion, and suggestions for the study looking at the relationship between cholera outbreaks flooding disasters and their impacts on informal settlement in Epworth's Ward 5. The report provides an overview of the investigation, demonstrates how the goals of the research were met, and draws conclusions based on the major discoveries. The goal of this study is to address and resolve the concerns brought up by the project's goals. In order to provide a solution to the discussed problem, it also makes conclusions from the data analysis. Important conclusions were the subject of recommendations.

#### **5.2 Summary**

The study managed to examine the impacts of cholera outbreaks ad flooding disasters on informal settlements of Ward 5 in Epworth. The study's introduction outlines the research methodology, including the study's background, problem statement, aims, and research questions. The goals of the research were to point out the impacts of Cholera outbreaks that come about due to flooding in Epworth's informal settlements and offer remedies for the negative effects of flooding disasters from the viewpoint of the research subjects in the study region. The primary research objectives were to identify the impacts of flooding and the impacts of cholera outbreaks on the informal settlements, as well as the problems and outcomes related to these settlements over the previous years in Epworth and the role responsible authorities played in regulating the growth of the settlements. Chapter one covered a quick overview of the field's history, the study's rationale, its underlying assumptions, an explanation of important terminology, delimitations, and its limits.

The cholera epidemics in Zimbabwe were also covered in the second chapter. In order to identify a variety of difficulties associated to flooding impacts on the informal settlements, the literature was also read. The main issue being that no services are supplied to the informal settlements because of infrastructure destruction. Social marginalization occurs in these communities with regard to resource distribution, service delivery, and other aspects. The researcher emphasized the research design in chapter 3, which was used in the study to plan the structure of information to be gathered in the research field. The research design used in the study was qualitative. Primary information included how the researcher talk about the advantages and disadvantages of employing surveys, interviews, and observations as research tools. Secondary data was obtained from publications written by other scholars working in this topic. Participants were chosen by convenience and purposive sampling, with a sample size of twenty chosen to ensure the effectiveness of the data collection instruments in the actual research field. Lastly, there were advantages to ethical research norms.

Graphs, tables, and photos were used in Chapter 4 for data analysis and presentation to display the field data in a clear and understandable way with thorough explanations. In total, 90% of the surveys and interviews were answered. Twenty individuals in total, representing the ward took part in the study. This response rate is valuable and warranted since the percentage rate above 50% and the data gathered can be utilized to reflect and predict results for the full sample. The respondents noted that there are numerous challenges in informal settlements. The study also reviewed literature on the causes and the complex socio-environmental impacts of illegal settlements. The main causes of illegal settlement which were noted were poverty, migration, politics and lack of effective housing options. Literature was also referred to identify a number of problems which are associated with informal settlements. From empirical literature, the impacts highlighted include lack of access to basic services, poor waste management, health problems, susceptibility to disasters, substandard housing and poor infrastructure and overcrowding.

Solutions to negative impacts of illegal settlements were highlighted and these include regularisation of illegal settlement, provision of affordable housing options as well as relocation and resettlement.

The study also highlighted the research design which was used in the study to plan structure of information to be gathered in the research field. Description of the study area and the study

area map were presented. Descriptive research design was used in the study. Questionnaires, interviews and surveys were used to collect data using simple random sampling. Data was presented using graphs and pie charts to show information collected from the field in a way that is presentable with explanations of the diagrams. The overall response rate for both interviews and surveys were above average. The majority of the respondents noted that they were living in the informal settlements due to poverty and are suffering the impacts of flooding which include cholera and destruction of their homes. Community among other challenges, some of which include overcrowding, health issues, substandard housing as well as vulnerability to disasters. However, there were a number of solutions perceived to be effective to address the challenges of illegal settlement by the respondents so as to eradicate the settlements and bring sanity such as regularization, provision of affordable housing options relocation and resettlement and others so as they will be on the same level with those living in formal settlements. The focus was on Epworth which is satellite town 15 km south of Harare.

### **5.3 Conclusion**

Taking into account the area of study, the researcher managed to establish the relationship that exists between flooding disasters and cholera outbreaks on informal settlements in Epworth ward five. Epworth has been experiencing the increasing influx of people from Harare and other areas and ELB has not been able to provide housing to these people. There are a number of reasons which have made people to form informal settlement, which is however increasing their vulnerability to cholera when flooding occurs. People due to a number of reasons have been left with no option but to accommodate themselves and by whatever means which is less administrative and “affordable”.

There are a lot of challenges associated with the growth of informal settlements and increase of flooding impacts like Cholera. The challenges have been as a result of being segregated from others as they are considered as illegal occupants by urban planning authorities. Because they are informal settlement, the ELB does not recognize the settlement though they are in their area of jurisdiction. Lack of basic services such water, sewer system, roads and other are absent in

the settlements with NGO such as MSF, EFZ and others coming in alleviate the challenges faced by providing humanitarian aid. The least available basic services in these settlements are boreholes for clean source of water, mobile clinic for primary health all being provided by these NGOs. The community have come together to make and are now making their roads and other services for themselves so as to make the areas accessible thus creating avenues for future development. This research delved into the intricate interplay between cholera outbreaks, flooding disasters, and their impacts on informal settlements, particularly in Epworth, Ward 5. By addressing four key research questions, significant insights have been gleaned regarding the nexus of these phenomena and the vulnerabilities they pose to the community.

The findings underscored a pronounced relationship between flooding events and the occurrence and spread of cholera within the squatter settlements of Epworth. As evidenced by previous studies, the heightened risk of cholera transmission in flood-affected areas is attributed to compromised sanitation infrastructure and the contamination of water sources, exacerbating the precarious living conditions in informal settlements. The analysis revealed discernible spatial and temporal patterns of flooding, exhibiting a notable correlation with cholera cases. This aligns with existing literature, which highlights the significance of understanding the dynamics of flood events in mitigating cholera outbreaks and implementing targeted interventions. The insights into residents' perceptions and responses to cholera outbreaks and flooding disasters shed light on the socio-cultural dimensions of vulnerability. The narratives of community members underscored the resilience strategies adopted amidst recurrent crises, emphasizing the need for context-specific interventions that incorporate local knowledge and empower community-driven initiatives. The results demonstrated a strong correlation between flooding incidents and the development and spread of cholera in Epworth's squatter communities.

Previous research has demonstrated that contaminated water sources and weakened sanitation infrastructure contribute to the increased risk of cholera transmission in flood-affected areas, further aggravating the unstable living circumstances in informal settlements. The results of the research showed clear temporal and spatial patterns of flooding, which were found to be significantly correlated with instances of cholera. This is consistent with previous research, which emphasizes how important it is to comprehend the dynamics of flood events in order to prevent cholera outbreaks and carry out focused interventions. The views and reactions of locals to flooding catastrophes and cholera epidemics provide important insights on the socio-

cultural aspects of vulnerability. The accounts provided by community members highlighted the Resilience tactics implemented in the face of repeated disasters, with a focus on the necessity of context-specific interventions that leverage local expertise and support community-driven projects.

The investigation of the core causes of informal settlement vulnerability exposed a number of intricate problems, from inadequate infrastructure and socioeconomic disparity to bad governance and restricted access to healthcare. To overcome these structural gaps, comprehensive programs involving infrastructure development, policy reforms, and community engagement strategies must be developed. Because of this, our study highlights how important it is to put in place a comprehensive, multidisciplinary plan to address the connection between cholera outbreaks and flooding disasters in informal settlements like Epworth, Ward 5. Evidence-based treatments, participatory procedures, and local knowledge systems can be used to create sustainable solutions that reduce the impact of these interconnected issues and increase the resilience of communities that are at risk.

## **5.4 Recommendations**

- Combined strategies for Cholera prevention and Flood management should be adopted and integrated flood management strategies that provide top priority to cholera preventive measures, like enhancing the infrastructure for water and sanitation, encouraging good hygiene, and guaranteeing prompt response procedures.
- Warning systems and Risk communication, establishing robust early warning systems for flooding and cholera outbreaks, incorporating meteorological data, disease surveillance, and community feedback mechanisms. Conduct regular awareness campaigns and capacity-building workshops to enhance risk communication and community preparedness, empowering residents to take timely preventive actions.

- **Spatial Planning and Infrastructure Development:** Integrate considerations of flood risk and cholera vulnerability into urban planning processes, ensuring the inclusion of informal settlements in resilient infrastructure development initiatives. Invest in sustainable drainage systems, safe housing, and accessible healthcare facilities to reduce exposure to hazards and improve health outcomes in vulnerable communities.
- **Community engagement and empowerment,** thereby fostering community-led initiatives and participatory decision-making processes to empower residents in informal settlements. Facilitate the formation of local task forces, volunteer groups, and community health committees to coordinate emergency response efforts to promote social cohesion, and amplify community voices in policy dialogue.
- **Addressing structural inequities and Socio-economic factors** to tackle underlying determinants of vulnerability by addressing poverty, inequality, and inadequate access to basic services, and advocating for inclusive policies that prioritize the rights and well-being of marginalized populations, including tenure security, livelihood support, and social protection mechanisms.
- **Research and knowledge sharing** which encourages interdisciplinary research collaborations and knowledge exchange platforms to further investigate the complex interactions between flooding, cholera, and informal settlements. Fostering partnerships between academia, government agencies, and civil society organizations to generate evidence-based solutions and facilitate the uptake of best practices in disaster risk reduction and public health.

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## **APPENDICES**

### **APPENDIX 1: Interview guide**

My name is Janet R. Katumba. I am a student currently studying Bachelor of Science Honours Degree in Disaster Management Sciences at Bindura University of Science Education. This interview guide has been designed to collect information from representatives in the study area. You are requested to provide the following information to the best of your knowledge. The information will be treated with strict confidentiality.

Interview date..... (Interviews done after the consent by the respondents)

1. What is your perception of the relationship between flooding events and the occurrence and spread of cholera in the informal settlements of Epworth?
2. In your experience, how have flooding events influenced the frequency and severity of cholera outbreaks in these settlements?
3. Are there any challenges or barriers that you face in responding effectively to these dual disasters?
4. In your opinion, what are the underlying factors that contribute to the vulnerability of informal settlements to cholera outbreaks in Epworth?
5. How has issues such as poor sanitation, inadequate infrastructure, and overcrowding exacerbate the impact of both cholera outbreaks and flooding disasters in Epworth?
6. Are there any additional factors or dynamics that you believe contribute to the vulnerability of informal settlements in your community?

## **APPENDIX 2: Survey Guide**

### **Introduction**

**Targeted population:** Residents in Epworth ward 5 that will be present in their households during the survey

**Survey method:** In person

**Questionnaire structure:** Multiple choice

**Questionnaire content:**

Factors contributing to vulnerability	Agree	Disagree	neutral	Strongly disagree
Poor Sanitation				
Lack of clean water access				
Inadequate health care facilities				
Overcrowding				
Other (please specify)				

**Response categories:** Agree, Disagree, strongly disagree, Neutral

**Survey length:** .....

### **APPENDIX 3: FGD guide**

#### **Introduction:**

Welcome to the focus group discussion. The purpose of this discussion is to gather insights and perspectives on the relationship between cholera outbreaks, flooding disasters, and their impacts on informal settlements in Epworth, Ward 5. Your input is invaluable in understanding the challenges faced by the community and identifying potential solutions. Please note that your participation is voluntary, and all information shared will be kept confidential.

#### **Warm-Up Questions:**

1. Can you briefly introduce yourself and your connection to the community of Epworth, Ward 5?
2. How long have you been living in Epworth, and what changes have you observed over time, particularly regarding flooding and cholera outbreaks?

#### **Main Discussion:**

##### **1. Perception of Cholera Outbreaks and Flooding Disasters:**

- How would you describe the community's perception of cholera outbreaks and flooding disasters?
- What are the primary concerns or fears associated with these events?
- Have there been any notable experiences or stories related to cholera outbreaks or flooding disasters in your community?

##### **2. Impact on Daily Life and Livelihoods:**

- How do cholera outbreaks and flooding disasters affect daily life and livelihoods in informal settlements?
- What are the main challenges faced by residents during and after these events?

- How do households cope with the economic and social impacts of cholera outbreaks and flooding disasters?

### 3. Response and Coping Strategies:

- What are the typical responses or coping strategies adopted by the community during cholera outbreaks and flooding disasters?
- Are there any existing initiatives or community-led efforts to address these challenges?
- What support or resources are needed to enhance the community's capacity to respond effectively?

### 4. Vulnerability and Risk Factors:

- What factors contribute to the vulnerability of informal settlements to cholera outbreaks and flooding disasters?
- How do socio-economic disparities, infrastructure limitations, and governance issues exacerbate vulnerability?
- Are there any specific groups within the community that are more vulnerable to these events?

### 5. Suggestions for Mitigation and Preparedness:

- Based on your experiences and insights, what do you believe are the most effective strategies for mitigating cholera outbreaks and flooding disasters in Epworth, Ward 5?
- How can local authorities, NGOs, and other stakeholders better support the community in building resilience and preparedness?
- Are there any lessons learned or best practices from past experiences that can inform future interventions?

### Closing:

Thank you for your participation and valuable contributions to this discussion. Your insights will inform our research and contribute to efforts aimed at addressing the nexus of cholera outbreaks and flooding disasters in informal settlements. If you have any additional comments or questions, please feel free to share them before we conclude.

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Note: The moderator should encourage open dialogue, active participation, and respect for differing perspectives throughout the focus group discussion.



#### **Appendix 4: Ethical considerations form**

Research Title: Understanding the Nexus of Cholera Outbreaks and Flooding Disasters in Informal Settlements: A Case Study of Epworth, Ward 5

Principal Investigator: Janet R. Katumba

Date: .....

Introduction:

This form is designed to ensure that participants in the research study titled "Understanding the Nexus of Cholera Outbreaks and Flooding Disasters in Informal Settlements" are fully informed about the purpose, procedures, potential risks, and benefits of participating in the study. Your participation is voluntary, and your decision to participate or decline will not affect your relationship with the researchers or any associated institutions.

Participant Consent:

I, ..... (Participant's Name), hereby acknowledge that I have read and understood the information provided in this form. I voluntarily agree to participate in the research study mentioned above.

Purpose of the Study:

The purpose of this study is to investigate the relationship between cholera outbreaks, flooding disasters, and their impacts on informal settlements in Epworth, Ward 5. The research aims to identify patterns, perceptions, and underlying factors contributing to vulnerability in order to inform future interventions and policy decisions.

### Procedures:

As a participant in this study, you will be asked to:

- Participate in interviews or focus group discussions.
- Share your experiences, perceptions, and knowledge related to cholera outbreaks and flooding disasters.
- Provide consent for the use of any audio or written recordings for research purposes.

### Potential Risks:

Participating in this study may involve discussing sensitive topics related to health, disasters, and living conditions. While efforts will be made to ensure confidentiality and privacy, there is a possibility of discomfort or emotional distress during the interview process. If at any point you feel uncomfortable or wish to withdraw from the study, you are free to do so without any consequences.

### Benefits:

Your participation in this study will contribute to a better understanding of the challenges faced by communities in informal settlements and may inform future interventions aimed at improving public health and disaster preparedness. Additionally, sharing your experiences and perspectives can raise awareness and facilitate dialogue on these important issues.

### Confidentiality:

All information collected during the study will be kept confidential and used for research purposes only. Your identity will be protected, and any identifying information will be removed or anonymised in the final analysis and reporting of results.

Voluntary Participation:

**Participation in this study is entirely voluntary, and you have the right to refuse or withdraw at any time without penalty. Your decision will not affect your access to any services or benefits.**

Contact Information:

If you have any questions or concerns about the study or your participation, please feel free to contact the Principal Investigator, Janet R. Katumba, at **0777146715**.

By signing below, you acknowledge that you have read and understood the information provided in this form and voluntarily consent to participate in the research study.

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Participant's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Researcher's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**\*Please retain a copy of this form for your records.\***