AN ASSESSMENT OF KNOWLEDGE, ATTITUDES AND PRACTICES RELATED TO TYPHOID AND ITS MANAGEMENT STRATEGIES IN MBARE HIGH DENSITY SUBURB IN HARARE, ZIMBABWE.

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APPROVAL FORM

The undersigned certify that they have read this project and have approved its submission to the Geography Department for marking after confirming that it conforms to the Department requirements.

Supervisor....................................................... Signature......................................

Date………………………….
DECLARATION

I, MATSWETU PAMELA C.M declare that this project is my own work. The work has not been copied or taken from any source without acknowledgement of the author or publisher.

Signed……………………………….. Date……………………………………..
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ABSTRACT

Epidemiological disasters have increased as a result of poor knowledge, attitudes and practices in communities. Health education is an important component of achieving national and international public health goals, by encouraging the adoption of practices that promote good health, there is increased reduction in health risks. Salmonella typhi outbreaks have been reported in Mbare high density suburb in Matapi flats since 2016 and at the peak was the October 2016 to February 2017. The typhoid transmission prevalence continued despite increased the implementation of risk management strategies like health education, hygiene promotion activities and hand-washing facilities established to prevent and control the outbreak. An assessment of knowledge, attitude and practices (KAP) related to typhoid and its management strategies study was carried out to assess the effectiveness of ongoing typhoid fever preventive interventions per household level. This research employed a cross-sectional survey that was conducted in Mbare Ward 4 (Matapi flats, Chishawasha flats and Annex) selected areas in a bid to have a comparison of the rate of exposure in the different settings during the period of the outbreak. The research was both qualitative and quantitative and data collection tools were KAP related questionnaires and key informant interviews. The data was then analysed using Microsoft excel. The findings revealed that the knowledge, attitudes and practices of communities in Mbare high density suburb are at a moderate scale (53%) as there is still a bigger percentage (47%) of those that have low levels of knowledge, poor practices and negative attitudes. As a result this might have led to their exposure to risk of contracting typhoid due to their differences in KAP and the way they perceive risk. Generally, residents from Annex had the highest level of knowledge compared to Matapi and Chishawasha. The findings of this study underline the need for strengthening up health education and hygiene promotion activities per household level in Matapi and other overcrowded areas in Mbare so as to promote positive behavioural change in turn promoting an increase in knowledge levels, positive attitudes and good practices as some of the knowledge, practices and attitudes have affected the effectiveness of risk management strategies. Therefore, through understanding the different KAP that relate to typhoid there will be an increase in disaster risk reduction in high density suburbs thus reducing community’s exposure to typhoid.
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<tr>
<td>CCA</td>
<td>Climate Change Adaptation</td>
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<tr>
<td>CDC</td>
<td>Centre for Disease Control</td>
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<tr>
<td>DRM</td>
<td>Disaster Risk Management</td>
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<td>DRR</td>
<td>Disaster Risk Reduction</td>
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<td>EMA</td>
<td>Environmental Management Agency</td>
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<td>GTI</td>
<td>Gastro-intestinal Tract</td>
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<td>KAP</td>
<td>Knowledge, Attitudes and Practices</td>
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<td>MoHCC</td>
<td>Ministry of Health and Child Care</td>
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<td>NGO’s</td>
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<td>PAR</td>
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<td>UNICEF</td>
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<td>UNISDR</td>
<td>United Nations International Strategy for Disaster Reduction</td>
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CHAPTER ONE: INTRODUCTION

1.1 Introduction

This study assessed the knowledge, attitude and practices related to typhoid and its management strategies in Mbare high density suburb. The chapter focuses on the background to the study, the research problem, the research objectives and questions. The chapter also outlines the justification of the study and the scope of the research.

1.2 Background

Typhoid fever is one of the leading causes of morbidity and mortality across the world (Nagashetty et al, 2010). In endemic areas, the disease is most commonly found in children 5–19 years of age. International visitors from non-endemic areas are also at risk if unvaccinated (Heymann, 2014). According to the most recent estimates approximately 21 million cases and 222 000 typhoid-related deaths occur annually worldwide (WHO, 2015). The global burden of the disease in low- and middle-income countries in 2010 was estimated to be 11.9 million cases, including 129,000 fatalities, after adjusting for water-related risk factors (Mogasale et al., 2014). Typhoid fever is a systemic infectious disease caused by Salmonella typhi. This bacteria Salmonella typhi has an incubation period of 8-14 days. The major cause of typhoid epidemics is the use of contaminated food and water (Sarkar et al., 1991). Transmission of typhoid is via the faecal oral route. It occurs predominantly in association with poor sanitation and lack of clean drinking water (WHO, 2015). Signs and symptoms include sustained fever, headache and malaise. The bacteria are present in many Southeast Asian countries as well as in Africa, Central and South America, and Western Pacific countries in areas where there is poor water and sewage sanitation. Likewise, floods in these regions can also quickly spread the bacteria. Typhoid fever can be treated with antibiotics. However, resistance to common antimicrobials is widespread (WHO, 2012).

The growing rate of urbanization and the increase in population density (in cities) can lead to creation of risk, particularly when urbanization is rapid, poorly planned and occurring in a context of widespread poverty (UNISDR, 2013). The lack of suitable infrastructure and services, unsafe housing, inadequate and poor health services can turn natural hazard into a
disaster. For example, poor solid waste management can cause blockage to storm water and sewage networks that can lead to waterlogging and flooding. Damage of infrastructure can lead to water scarcity or contamination. Inaccessibility to safe housing with good provision for water, sanitation, health care and education affects the capacity of urban residents to recover. Typhoid continues to pose an important public health problem in Zimbabwe, mainly in urban settings and it is a notifiable disease under the country’s Public Health Act (Harare City Health report 2011, unpublished). Harare, the capital of Zimbabwe, experienced several enteric infection epidemics in recent years: in 2008 and 2009, and again in 2010, epidemics of cholera affected large parts of the country (WHO and MOHCC, 2010) while in 2010, Harare experienced an epidemic of typhoid fever. The epidemics have been linked to underinvestment in the maintenance of water and sanitation infrastructure, leading to irregular water supplies, difficulties in protecting drinking-water supplies, and the breakdown of sanitation systems (Mason, 2009).

The City of Harare has had periodic outbreaks of typhoid since 2010, mainly affecting the high density western suburbs including Dzivarasekwa and Kuwadzana (2010 and 2011), Glenview in (2012) and Mbare (2016 and 2017). The lack of water, combined with high temperatures has created a perfect environment for infectious diseases. Glen View has been among the epicentres for each of the outbreaks that have affected Harare between 2013 and 2016. In an outbreak in Harare in 2016, Glen View contributed 36% of the cases and knowledge, attitude and practices (KAPs) have been demonstrated as key drivers in the transmission and control of typhoid (Bara et. al., 2016). Hence there is need to assess the KAP related to typhoid as well as typhoid management strategies in other residential areas including Mbare high density suburb.

1.3 Problem statement

The accelerating rates of exposure, frequency and intensity of typhoid outbreaks in Harare high density suburbs have become a common routine which has not changed but rather has heightened. Despite having placed different strategies including health education and awareness campaigns to avert the typhoid threat there was a huge outbreak in December 2016. According to Masunda et. al., (2017), typhoid cases in Mbare were reported between October 2016 and February 2017. As of 1 February 2017 there were 207 suspected cases, 28 confirmed cases and 2 deaths. The common source of the outbreak was due to the breakdown of water
and sewage systems which were further exacerbated by flooding and the reduced supply of municipal water. Contamination of borehole water at such a level showed that in the cities reliance should be on piped water system and all efforts should be made to improve the water supply and repair of sewer lines to prevent the occurrence of further outbreaks (Masunda et al., 2017). Against this background, this study sought to look into the household level knowledge, attitude and practices (KAP) related to typhoid outbreaks in Mbare as it is perceived that lack of knowledge about these lead to high risk of disease spreading and increasing related mortality and morbidity. Ignorance and impoverished conditions of people may contribute in creating source and spread of typhoid and hinder disease control strategies. Risk reduction strategies were implemented however, the typhoid disease prevalence still increases hence the need to address the KAP as risk factors towards the increased rates of typhoid fever in Mbare. Also the study will assess the effectiveness of the strategies implemented and provide the recommendations in a bid to reduce the typhoid prevalence.

1.4 Research objectives and questions

1.4.1. Main Research Objective
To assess the knowledge, attitudes and practices related to typhoid at household level and the effectiveness of the typhoid management strategies in Mbare High Density suburb Harare, Zimbabwe.

1.4.2. Specific Research Objectives

1. To assess the knowledge, attitudes and practices related to typhoid fever at household level in Mbare.
2. To compare the knowledge, attitudes and practices related typhoid fever at household level between different residential areas in Mbare.
3. To determine the effectiveness of typhoid risk management strategies used in Mbare.
4. To identify strategies for improving the knowledge, attitudes and practices related to typhoid and the effectiveness of the typhoid risk management strategies in Mbare.
1.4.3. Main Research Question

What are the knowledge levels, attitudes and practices related to typhoid at household level and its management strategies in Mbare high density suburb?

1.4.4. Specific Research Questions

1. What are the knowledge attitude and practices on typhoid risks per household in Mbare?
2. What is the difference in knowledge, attitudes and practices related to typhoid fever per household level between different residential areas in Mbare?
3. How effective are the strategies put in place for typhoid risk management in Mbare?
4. How can the knowledge, attitudes and practices related to typhoid prevention, preparedness and response be improved in Mbare?

1.5. Justification of the study

The results of this study will pave way for advanced disaster risk reduction initiatives at local and national levels in a bid to reduce typhoid risks in Zimbabwe. This will be achieved through improving the understanding of the KAP related to typhoid at household level in high density suburbs and strengthen the policy framework for typhoid disaster risk management. Therefore, results obtained from this study will help conscientise the urban communities especially in densely populated residential areas in Harare and other cities in Zimbabwe and other developing countries on how to prevent, prepare and respond to typhoid outbreaks.

By investigating the effectiveness of typhoid risk management strategies that are being implemented in Mbare the study seeks to identify the main gaps in the implementation and how best to find solutions to counteract the challenges. It is hoped that the results would be of great use to programme planners, academics, policy formulators and implementers, donors, curriculum developers and other service providers in control of typhoid fever.

1.6. Scope

This study will mainly focus on the KAP related to typhoid and its management strategies implemented before and after the 2016/2017 typhoid outbreak in Mbare Harare. It will also examine the effectiveness of the strategies implemented. The study will look into other factors
hindering the success of these strategies in a bid to reduce the risks that may cause or worsen the typhoid outbreak situation.

1.7. Limitations of the study

The study is a case follow up hence it was difficult to get the actual data on KAP of what really transpired during the period of the outbreak per households as a result of the time the outbreak was reported. Also measures for prevention and control of the outbreak, including hygiene promotion and health education, had been put in place; the KAP may have been altered by these ongoing interventions. This situation may have contributed to concealing of some study results. We addressed this limitation by combining quantitative data collection with observation of hygiene practices. However, through following the right channels of data collection the location of the households that were present during the outbreak were identified.

1.10 Assumptions

The researcher assumes that the respondents are honest and free from any influence when they answer the various questions. The researcher also assumes that gender does not affect the way people view things.

1.11 Definition of terms

**Typhoid fever** is an illness caused by bacterium Salmonella. It is a gastrointestinal infection caused by *Salmonella enterica typhi* bacteria. It is transmitted from person to person through the faecal-oral route where an infected or asymptomatic individual (who does not exhibit symptoms) with poor hand or body hygiene passes the infection to another person when handling food and water. However, classic water safety and access to sanitation development remain powerful tools for the control of typhoid fever, yet the huge economic costs and long timelines are unlikely to provide a short to middle-term solution (Steele et al., 2016).

A **KAP survey** usually is conducted to collect information on the knowledge (i.e., what is known), attitudes (i.e., what is thought), and practices (i.e., what is done).
Knowledge is a fluid mix of framed experience, contextual information, values and expert insight that provides a framework for evaluating and incorporating new experiences and information (Davenport and Prusak, 1998).

Attitude can be defined as an enduring organization of motivational, emotional, perceptual, and cognitive processes with respect to some aspect of the individual's world" Krech and Crutchfield (1948). These definitions emphasized the enduring nature of attitudes and their close relationship to individuals' behaviour. Some sociologists (e.g., Fuson, 1942) and psychologists (e.g., Campbell, 1950) even defined attitudes simply in terms of the probability that a person will show a specified behaviour in a specified situation.

Practice is the actual application or use of an idea, belief, or method, as opposed to theories relating to it.

Disaster risk management is the systematic process of using administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disasters. Emerging threats, including multidrug resistance, increasing urbanization and population growth in regions such as sub-Saharan Africa have further increased the prevalence of high epidemiological disaster risks thereby making it difficult to promote risk management.

Strategy refers to a plan of action designed to achieve a long term or overall aim (oxford dictionary)

1.12 Organization of the Study

The study is structured in a systematic form of five chapters. Chapter one introduces the research which includes the background of the study, statement of the problem, aim, objectives and research questions, scope, significance of the study and the project structure. The chapter two gives a literature review related to the study highlighting the knowledge gaps and it presents the basis from which research findings are discussed. Chapter three outlines the methodology of the study highlighting the study area, study design, sampling and the data collection criteria, including the materials used in data collection and analysis. Chapter four
shows the results of this study and discussion. Finally, chapter five provides a summary, conclusion and recommendations as derived from the study.

1.13 Chapter conclusion

This chapter highlighted the background study of the area and aim of the study which seeks not only to assess the KAP related to typhoid in Mbare high density suburb in Harare but also to identify the and management strategies that are already being applied in the community and their related challenges.
CHAPTER TWO: LITERATURE REVIEW

2.0. Introduction

This chapter reviews existing information on KAP related to typhoid and its management strategies in high density suburbs in developing countries. A literature review’s aim is to demonstrate familiarity with existing knowledge and establish credibility in the process. While in another instance, reviewing literature helps to place a research project in a context, thereby demonstrating its relevance (Neuman, 2011). The studies presented will give an overall historical perspective on the topic of typhoid risk management. Therefore, this review will look into the KAP related to typhoid, the effects and also the typhoid outbreak response measures that were put in place.

2.1. Typhoid fever

Typhoid Fever is a gastrointestinal infection caused by *Salmonella enterica typhi* bacteria. It is transmitted from person to person through the faecal-oral route where an infected or asymptomatic individual (who does not exhibit symptoms) with poor hand or body hygiene passes the infection to another person when handling food and water. The bacteria multiply in the intestinal tract and can spread to the bloodstream. Paratyphoid fever, a similar illness, is caused by *Salmonella enterica paratyphi A, B, and C*. *Salmonella enterica* serovar Typhi (Typhi) is a Gram negative bacterium that causes typhoid fever a systemic illness of varying severity characterized by fever, headache, cough, abdominal pain, and other gastrointestinal.

Typhoid fever remains a global health problem. It is difficult to estimate the real burden of typhoid fever in the world because the clinical picture is confused with many other febrile infections, and the disease is underestimated because of the lack of laboratory resources in most areas in developing countries. As a result, many cases remain under-diagnosed. In both endemic areas and in large outbreaks, most cases of typhoid fever are seen in those aged 3–19 years.

Humans are the only natural host and reservoir. The infection is transmitted by ingestion of faecally contaminated food or water. Infection occurs by the fecal–oral route, most frequently in populations without access to safe drinking water or sanitation (Levin et al., 2009). The highest incidence occurs where water supplies serving a large population are faecally contaminated. The incubation period is usually 8–14 days, but may range from 3 days up to 2
months. Some 2–5% of infected people become chronic carriers who harbour S. typhi in the gall bladder. Chronic carriers are greatly involved in the spread of the disease. Many mild and atypical infections occur and relapses are common. Patients infected with HIV are at a significantly increased risk of severe disease due to S. typhi and S. Paratyphi (MOHCW et al., 2011).

2.2. Overview of the occurrence of typhoid and its severity globally

Typhoid fever is a major cause of mortality and morbidity worldwide. In endemic areas, the disease is most commonly found in children 5–19 years of age. International visitors from non-endemic areas are also at risk if unvaccinated (Heymann, 2014). The global burden of the disease in low- and middle-income countries in 2010 was estimated to be 11.9 million cases, including 129,000 fatalities, after adjusting for water-related risk factors (Mogasale et al., 2014). Globally, there are four billion cases of diarrhoea among children; cholera water borne bacteria infected 120,000 people in 2002 and in the same year there were 50,000 cases of guinea worm in thirteen African countries. Six million people are blind because of trachoma and twelve million people are infected with typhoid annually (WHO, 2000). Literature review has revealed that the most common source of typhoid outbreaks is contaminated water. For example in a study done in Karachi Pakistan, laboratory investigations confirmed the presence of multidrug resistant strain of Salmonella enterica serovar Typhi in 100% well water, 65% household water samples and 2% food items. 22% of clinical stool samples were tested positive with Salmonella enterica serover Typhi (Khan and Kazmi, 2009).

Knowledge, Attitude and Practices of at risk populations may increase the rate of prevalence of typhoid fever as their susceptibility towards the hazard will also be increased. For example, Nahimana et al., (2017) states that findings showed that knowledge and attitude towards typhoid fever prevention and control was low among the study population in Burundi refugee camps, which may have contributed to the prolonged transmission of Salmonella typhi in the camp. Only a quarter of respondents had received health education about typhoid fever prevention and control during the outbreak and only 34% knew how the disease is transmitted despite ongoing community mobilization and hygiene education at the time of the study. Furthermore, less than 40% of respondents knew how typhoid fever can be prevented. Therefore, there is need to assess the KAP of at risk populations as these may also promote the increase in rate of typhoid prevalence.
2.2.1. Typhoid in Zimbabwe

An outbreak of Typhoid occurred in the city of Harare against the backdrop of a challenged sewage reticulation system, limited access to safe water mainly affecting two densely populated suburbs of Harare, Mabvuku and Tafara (MOHCC, 2011). Similarly a typhoid outbreak that occurred in Dzivaresekwa Suburb of Harare City in Zimbabwe was found that drinking contaminated water from a well was an independent risk factor for contracting typhoid (Muti et al., 2011). Matambo et al., (2016) states that Glen View has been among the epi-centres for each of the outbreaks that have affected Harare between 2013 and 2016. In an outbreak in Harare in 2016, Glen View contributed 36% of the cases and Knowledge, Attitude and Practices (KAPs) have been demonstrated as key drivers in the transmission and control of typhoid (Bara et al., 2016). Hence there is need to assess the KAP related to typhoid in Mbare high density suburb. Mbare high density suburb being densely populated is potentially a high-risk area for typhoid outbreak. This is an indication that typhoid fever is a disease of public health importance in this densely populated suburb especially if their KAP may increase their rate of susceptibility to typhoid.

2.3. Theoretical Framework

PAR model (Blaikie et al, 1994)

This framework will help understand the typhoid risk factors in relation to the KAP of Mbare residents. Blaikie et al., (1994) proposed a conceptual model known as the “Pressure and Release” model to describe patterns of social vulnerability from socio-economic, political and institutional forces into unsafe physical and social conditions that lead to mortality and morbidity in the event of a natural hazard. This model is based on the idea that an explanation of disaster requires us to trace a progression that connects the impact of a hazard on people through a series of levels of social factors that generate vulnerability. A disaster is conceptualized as a complex interaction of two opposing forces natural hazards and a vulnerable society. The most important root causes that give rise to vulnerability (and that reproduce vulnerability over time) are economic, demographic, and political processes. These affect the allocation and distribution of resources between different groups of people.

The approach tends to consider human beings as one of many elements at risk to varying degrees, given hazards with certain characteristics and an array of elements with differing degrees of potential for damage or loss (hence, structural vulnerability of buildings, bridges,
health care systems and people). The social vulnerability aspect of groups of people is generally lost in the analytical shuffle by administrators who seek to minimize the vulnerability of systems. Therefore, this framework will help to address the root causes of high prevalence of typhoid fever as it looks into the root causes of a disaster. Hence the effectiveness of the risk prevention and management strategies can also be promoted. However, Cave and Curtis, (2016) state that, through the availability of adequate quantities of safe water, improved sanitation facilities, as well as very good knowledge, attitude and most importantly, consistent and correct practice of appropriate hygiene and sanitation methods are critical to the prevention and control of such outbreaks there will be a decrease in typhoid prevalence thus the inclusion of the PAR model to help identify the gaps that lead to the increase in susceptibility of typhoid in Mbare.

The PAR model also helps address underlying factors that tend to expose high density suburb residents to typhoid risks. In this case the study looks at the KAP of households in relation to biological hazards. Most households are being exposed to risks due to their different vulnerabilities in knowledge, attitude and practices over prevalent disasters. For example in relation to the typhoid outbreak in Mbare poverty could be an underlying factor that would have led to dynamic pressure on resources as the high density areas are mostly overpopulated and there are not enough resources to cater for all. Also lack of access to public health education which in turn leads to unsafe conditions that may direct them to unsafe water sources or rather unsafe sanitation conditions as the infrastructure will be dilapidated and not strong enough to withstand the pressure. Thus when a biological hazard comes into play it quickly becomes a disaster as it would have interacted with the already vulnerable community in terms of their KAP. Hence the PAR model helps to look into the progression of vulnerability of a community and in this case the KAP of Mbare households.
City regions are becoming increasingly exposed and are creating new patterns of intensive risk; at the same time, poorly planned and managed urban development has generated new hazards and extensive risk (UNISDR, 2013). People, poverty and disaster risk are increasingly concentrated in cities. The growing rate of urbanization and the increase in population density (in cities) can lead to creation of risk, particularly when urbanization is rapid, poorly planned and occurring in a context of widespread poverty. Growing concentrations of people and economic activities in many cities are seen to overlap with areas of high risk exposure.

Inadequately planned and managed cities may create new risks which threaten to erode current development gains. The lack of suitable infrastructure and services, unsafe housing, inadequate and poor health services can turn natural hazard into a disaster. For example, poor solid waste management can cause blockage to storm water and sewage networks that can lead to waterlogging and flooding. Damage of infrastructure can lead to water scarcity or contamination. Inaccessibility to safe housing with good provision for water, sanitation, health care and education affects the capacity of urban residents to recover.
2.5. Typhoid Risk

The bacteria are present in many Southeast Asian countries as well as in Africa, Central and South America, and Western Pacific countries in areas where there is poor water and sewage sanitation. Likewise, floods in these regions can also quickly spread the bacteria. All travellers going to endemic areas are at risk, especially long-term travellers, adventure travellers, humanitarian workers, and those visiting friends or relatives in areas with poor sanitation. Note that original infection does not provide immunity to subsequent infections.

2.6. Risk factors associated with prevalence of typhoid fever

Disaster risks in towns and cities are strongly linked to underdevelopment. The largely unplanned expansion of cities to accommodate rapid population growth, insecure livelihoods; a lack of basic infrastructure and services such as water and waste management; poor urban and land planning; inadequate oversight of urban planning, land-use and building standards; as well as low accountability for the provision of infrastructure and basic services all increase poor people’s exposure to hazards, and vulnerability to their effects. Consequently, reducing risk and building resilience to disasters in urban areas requires tackling the developmental issues that underlie it (ActionAid, 2016). To add on, inadequate living conditions of poor populations including poor health, inadequate nutrition, poverty, illiteracy, and deficient or non-existent sanitation constitute a permanent threat to their physical and psychological security and create “everyday risks” which cause small-scale disasters on an ongoing basis (UNDP, 2010).

2.6.1. Water Contamination

The bacterium Salmonella typhimurium lives inside humans. The bacterium lives and multiplies in the blood stream and digestive tract of infected persons. Transmission is through contaminated faeces in water or food (Ray, 2002). Faecal pathogens are frequently transferred to the water borne sewage system, through flush toilets and pit latrines subsequently contaminating surface and ground water (Pruss et al., 2006). In regions with poor sanitation, the bacteria often spread after water supplies are contaminated by human waste (WHO, 2000). The principal carrier of typhoid bacteria is water. Water can be extremely dangerous when it becomes the vehicle of the transmission of disease. The principal sources of water contamination are man, animal and bird excreta (Twort, 1990). Untreated sewage is dangerous
to public health because it contributes to environmental water, land and air pollution. Discharging highly polluting waste into a body of water has negative effects on human, animal and plant life. Today, despite progress in cleaning up waterways in some areas, water pollution remains a serious global problem, with impacts on the health of freshwater ecosystems and the human communities that rely on them for water supply.

Typhoid fever can spread if sewage contaminated with the germ gets into the water people use for drinking or washing food. The results of the Zimbabwe investigation showed that in highly populated areas of the city many old and damaged boreholes, which are wells drilled deep into the ground to access underground water, were contaminated with faeces. The region had experienced record rainfall and flooding, which caused sewer systems to overflow and contaminate the city’s water sources, making people sick (CDC, 2017). Under normal circumstances the Harare City council should have provided enough tap water for the increasing population in Mbare as this has led to the drilling of the boreholes. Later alone knowing that the same incidence had occurred in Glenview in 2012 where there was a typhoid outbreak as a result of borehole water being contaminated. Proactive measures to reduce the prevalence of typhoid fever would have been provided so as to avoid reoccurrence of typhoid fever related to borehole water contamination.

2.6.2. Sanitation practices

Sanitation refers to the safe collection, storage and disposal of various wastes resulting from human activities. These include solid wastes, refuse and liquid wastes effluent from sewage works, kitchen sink and even hazardous waste from industries. It also refers to the general maintenance of the human environment in a safe condition free from pollution. It involves the behaviour change and availability of adequate facilities that ensure a hygienic environment (MOH, 1999; Nyamwaya et al., 1999). Poor sanitation practices are a cause of bacterial, viral, protozoa and helminthic infections (Feachem, 1997).

In many developing countries there exists a high prevalence of water and sanitation related diseases causing many people to fall sick or even die (WHO, 1987). Faeces can be the source of much sickness in the community if it is accessible to flies, fingers, and fluid and eventually to food (Wood, 1992). This pathway is known as the faecal-oral route of disease transmission (Donald, 2004). In order to combat diseases caused by inadequate sanitation more efficiently installation of sanitary excreta facilities should be encouraged with measures taken to dispose of wastes (Charles, 1995). In regions of the world where sanitation and garbage disposal are
lacking, typhoid fever continues to destroy life (Donald, 2004). Moreover, the rapid increase in the population combined with a massive migration to urban areas has led to the formation of urban centres of high population density in many countries. The increase in urban population has occurred at such a pace that it has outstripped the development of the health related infrastructure including basic sanitation.

2.6.3. Lack of hygiene

Personal hygiene involves those practices that promote mental, emotional, and physical health, as well as the social wellbeing of the individual (Shah and Hansotia, 2003). Lack of observance of the principles of hygiene do not only impact personal health, but they have implications on the health of the family as well as the community to which one belongs. Diarrhoeal diseases, cholera, typhoid fever and hepatitis could be spread in the community due to inadequate disposal of excreta by few members in the community (Alam et al., 2008) hence the need to address the KAP of a community in relation to typhoid fever.

Transmission is by contact with contaminated water and food through food handlers, sewage, contamination of drinking water or food. Large epidemics are most often related to faecal contamination of water supplies or street foods (WHO, 1998). Therefore, typhoid fever is more common in areas where hygienic practices are not observed and with poor sanitation practices. Infection with Salmonella typhi results in development of fever and other signs and symptoms (Levine, 1990). Typhoid fever can also be spread through irrigation of crops using sewage contaminated with Salmonella typhi. Humans are the only natural hosts of Salmonella typhi (Donald, 2004).

Food and water is rendered unfit for human consumption when contaminated with Salmonella typhi (GOK, 2005) and many naturally occurring water sources are liable to such contamination at some point (WHO, 1969). Typhoid fever is spread in faecally contaminated food and water and often comes in epidemics; hence it is one of the dangerous infections (David, 1993). The majority of urban populations are tenants in informal settlements where basic services such as water and sanitation are inadequate (UNDP, 2001). In African countries most high density suburbs are characterised with informal sectors as a way to promote their livelihoods, however, some may be food vendors who practice unhygienic methods of food preparation which end up being a health risk.
2.7. Typhoid risk management strategies (MOHCC, 2011)

2.7.1. Food and Personal hygiene

Hygienic practices include food and personal hygiene. Food hygiene is concerned with all measures necessary for ensuring the safety, cleanliness and soundness of food at all stages of production, preparation, marketing and distribution (Wood, et al., 1992). Though food is a basic human need it can sometimes cause a number of illnesses arising from pathogenic and toxic substances, which find their way into food through contamination or spoilage (WHO, 2005).

2.7.2. Education

Educating community members, notably the most vulnerable who include food handlers and people in group settings. There is need to educate them on the importance of practicing hand washing with soap and running water before food preparation and eating, after using the toilet, handling soiled diapers, bed linen, and maintain a high standard of personal hygiene in general (MOHCC, 2011). Through education and awareness campaigns most messages advocate for behavioural change thereby promoting the reduction in typhoid risk.

2.7.3. Measures implemented to reduce typhoid

In Zimbabwe, some effort has been made by the authorities to curb typhoid. Some of the strategies include: the combating the selling of food stuffs (vending), appealing to the communities on personal hygiene, conducting awareness campaigns spearheaded by EMA. Harare City Council encouraged waste management and addressed the unsafe and unclean water challenges. Also the City Council addressed the problems of blocking sewer systems considering the increasing population in Mbare.

Recommended household prevention measures include treatment of household drinking water with point-of-use chlorination or filtration, safe water storage, discouragement of open defecation, construction of household latrines, and education on hygiene practices, including hand washing with soap and safe food handling (WHO, 2012).
2.8. Way forward

The literature revealed the critical need to look into the different KAP related to typhoid so as promote the reduction in prevalence of typhoid fever in Zimbabwe especially in high density suburbs like Mbare. The objective of this study was to explore knowledge, attitude and practices of general community regarding relationship of typhoid fever, with unhygienic food, unboiled water and unhygienic practices in the high density areas as these tend to expose the community to high risks of contracting typhoid. If KAP of the Mbare residents is assessed and addressed there are high chances of a reduction in typhoid outbreaks in the area as their vulnerabilities will be reduced and there will be increased knowledge on how best to avoid typhoid risks per household level.

Disaster risk management in developing countries is often restricted to disaster response. City management is often reactive to disasters rather than being proactive, with little consideration given to reducing or managing risk in a comprehensive, preventive manner. In spite of the potential impacts that disasters have on the financial resources of city governments and the functionality of the city as an entity, actions related to the management of disaster risk remains of an ex-post nature, with little attention to preventing or mitigating measures (World bank, 2011). Although some emergency and disaster response capability may exist, few cities in the developing world are truly prepared to manage disaster events in part due to the day-to-day challenges that most city governments face.

Also due to the absence of standard protocols for disaster risk management and climate change adaptation, currently there are limited examples of cities that have standard procedures for incorporating DRM and CCA activities in city planning. Therefore, as a result the prevalence of typhoid fever and other diarrhoeal diseases may increase as climate change has also contributed to the contamination of other water sources through flooding. There is need to incorporate disaster risk management strategies that are preventive with the involvement of the communities that are mainly prone to the risks of these GTIs which is why it is important to assess the KAP of the people that are likely to be at risk. Some of the strategies being implemented may affect the community’s livelihoods thereby creating conflicts between the government and the people which in turn will further promote the prevalence of typhoid in these areas.
2.9. Chapter Summary

The chapter above has revealed the high rate of prevalence of typhoid fever in Zimbabwe and other parts of world. Therefore, typhoid risk factors and management strategies and their effectiveness from global level to local level need to be analysed as the knowledge gap has been outlined. In this observation it can be concluded that risk management strategies exist however, their effectiveness and efficiency needs to be addressed to ensure sustainability hence the need to address the KAP of people in at risk areas.
CHAPTER THREE: RESEARCH METHODOLOGY

3.0. Introduction

The chapter presents the methodologies used to gather data for the study. It presents the research design, methodology, study population, sample size, sampling techniques and instruments which will be employed in the study. Also to be looked at are the procedures of data collection and data analysis of the study. The chapter discussed the validity and reliability of the research and finally the ethics of the research.

3.1. Study area

Figure 3.1 A map of the study area: Mbare Ward 4
(Source: primary data)

Mbare is one of the oldest high-density suburbs located to the Southern part of Harare, Zimbabwe. It was the first high-density suburb, being established in 1907 and it is about 5 kilometres from the central business district of Harare (ZAFP, 2014). Masundire (2012)
pointed out that Mbare has roughly 87 000 people and it is believed that the poorest residents stay in this suburb with housing units generally overcrowded having five or more people sharing a single room. Mbare ward 4 has 3926 households (ZimStat, 2012). Mubaiwa (2006) asserted that it hosts the main Bus Terminus in Harare and the biggest agricultural produce market (Mbare Musika).

This high density area is dominated by the informal sector and illegal vendors are literally on every available. Although the informal sector enhances industrial expansion, adverse environmental impacts result from these activities when solid waste is not generated (Feresu, 2010). Bus terminuses, shop fronts and streets are decorated by the huge uncollected garbage mounds. The trade areas in this suburb are messy due to the inadequacies of the local authority in waste management services, residents’ desperate irresponsible behaviour and lack of knowledge on the harmful imprints of solid waste.

3.2. Research design

The study used a cross sectional design (qualitative and quantitative) focusing on exploring the views of the residents in ward 4 Mbare (Matapi flats, Chishawasha and Annex). This research design was also employed by Bara et al., (2016) in their study on the knowledge, attitudes and practices related to typhoid in Glen View Suburb, City of Harare. Qualitative research design involves documenting real events, recording the different views and perceptions of typhoid risks and the effectiveness of the typhoid risk management strategies implemented to reduce the prevalence of typhoid fever in Mbare and observing the behaviour of residents through their attitudes and practices. The design used in this study allowed the collection of adequate KAP data (both qualitative and quantitative) related to typhoid and its management strategies being implemented and their effectiveness and sustainability hence, collected both data.

3.3. The sampling frame

All households in Mbare ward 4 were considered as the population in this study. This population was divided into two groups i) Matapi flats households that are frequently at risk of typhoid and ii) other households in Annex and Chishawasha (detached and semi-detached houses) in Mbare which are not frequently affected by typhoid. This allowed comparison of the knowledge levels between these distinct residences. The key informant interviews were administered to Harare City Health department officials, the City Environmental management
technician and the MOHCC officials who were working on the 2016-2017 typhoid outbreak in Mbare.

3.3.1 Sample size

The study sample comprised of 100 households drawn from three sub-areas. Matapi flats (35), Chishawasha (31) and Annex (34) in Mbare Ward 4. This was done for comparison of KAP at household level in the different sub-areas in the same residential area. Three (3) key informant interviews were administered to the Harare City Health department officials and two (2) to MOHCC.

3.3.2. Sampling procedure

Stratified sampling was applied as the sample was divided into three stratas. (Matapi 35, Chishawasha 31 and Annex 34). Simple random sampling was applied to select households in the clusters. The samples were randomly selected so as to capture the different levels of KAPs in the different areas.

3.4. Data collection methods

The study used a triangulation of primary data collection instruments in order to facilitate the collection of rich qualitative and quantitative data. The key informant interviews were administered to the Harare City Health department and MOHCC. The study divided its sample into two major groups that is, the residents from the three distinct residential areas answered questionnaires where variables such as sex, age and level of education were used to identify the difference in variables that may affect the levels of knowledge, attitudes and practices of these different areas. Then selected key informants were interviewed whereby the interviews were carried out with City health officials and other influential authorities.

3.4.1 Questionnaires

Self-administered questionnaires were the main tools for this study, these were targeted to a significant number of households and were structured in nature facilitating gathering of qualitative information. The data was collected through the use of questionnaires on KAP related to typhoid at household level in Mbare high density suburb. The questionnaires were administered to the different households in Mbare. Knowledge-related questions addressed knowledge about typhoid fever and how it is transmitted and prevented; attitude questions
included the health-seeking behaviours of respondents. Practice-related questions enquired the use of faecal disposal facilities and hand washing practices, including frequency of hand washing before eating and after using the toilet, for the periods prior to December 2016 typhoid outbreak and after the implementation of preventive and control measures. Both open and close ended questions were included in the questionnaires issued for data collection. This instrument gave the opportunity to investigate a wide field of research as each respondent answers exactly the same questions in the same order, they were all responding to the same stimuli. The researcher subjects all respondents to the same questions, leading to the collection of valid and reliable information (Haralombos and Holborn, 2006).

A total of one hundred (100) questionnaires were issued amongst the different households in relation to sample size, 35 in Matapi, 34 in Annex and 31 in Chishawasha. This tool proved to be more practical, effective and efficient as it gathered varying perceptions, opinions and information of people pertaining to the risks of typhoid and effectiveness of typhoid risk management strategies implemented in Mbare high density suburb. The three groups gave the study an ability to compare the different environmental, social and economic factors that might have led to the outbreak.

### 3.4.2 Key Informant Interviews

Key informant interviews were conducted to get data on typhoid management strategies implemented in Mbare high density suburb. These were mainly targeted to Harare City Health department and Ministry of Health and Child Care officials working in Mbare mainly the health program managers. Key informant interviews involve typically a one on one interview between the researcher and a key informant. These refer to interviews carried mostly between people with particular knowledge and value pertaining to a study. These interviews served as information gathering catalysts through investigating the perceptions, attitudes, beliefs and experiences of the factors that may lead to typhoid outbreak and the effectiveness of the typhoid risk management strategies employed in Mbare. As advised by Creswell (2013) the questions in these interviews were open ended to enquire more information from the interviewee. The interviewees were given the chance to say out what they thought were the problems which were associated with the typhoid risk factors and effectiveness of the implemented typhoid risk management strategies in Mbare.
3.5. Validity and reliability of the study

The data collection tools were pretested to ensure validity and reliability hence a pilot study was done using a few households from Mbare. These households were not considered in the main study. Based on this study the data collection instruments were revised to make sure that they gather the intended data. The data gathering methods allowed for triangulation, which verified, collaborated and enhanced the credibility of the data. Therefore, both the reliability and validity of this research were improved by triangulation of data gathering methods, piloting of the study prior to data collection and pretesting of data collection tools.

3.6. Data analysis and presentation.

The study employed both qualitative and quantitative research methods as Maxwell, (2012) states that there is no single research methodology that is considered perfect in guaranteeing validity and reliability as both methods complement each other. The combination of diverse methods created a synergistic research project whereby one method enabled the other to be more efficient hence provided a fuller understanding of typhoid risks and its effects and also the risk management strategies implemented.

3.6.1. Qualitative data analysis

Qualitative data analysis methods were used to analyse qualitative data obtained from both questionnaires and key informant interviews. Content analysis was done to generate the themes, categories and codes and the results was presented in form of tables and graphs. Chikoko and Mhloyi, (2005) elude that, qualitative research design rarely discusses variables or hypothesis; instead the research gets ideas from the population under study. In support of the above, Berg (2009) argues that, qualitative research properly seeks answers to questions by focusing on the various social settings and the individuals who inhabit these settings. Qualitative approach was used by the study to obtain primary data from the residents of the study area concerning their KAP on typhoid risks and the implementation of the risk management strategies.

3.6.2. Quantitative data analysis

Data was obtained from the questionnaires which included data on the age groups mainly affected, the gender mostly affected and also the proximity of exposure to risk factors were
recorded. The most quantitative data from the primary data sources were presented in tables and graphs. The quantitative approach generates data from qualitative data which goes through quantitative analysis and provides a comparison study of the relationship between different variables (Bell, 2005). The study applied the quantitative approach because of the need to compare different statistics on knowledge levels. Through this research method data from different data collection tools were compared. Quantitative data were coded to allow statistical analysis using Microsoft excel. The data was then presented using a bar graphs, pie charts and tables.

The knowledge levels were rated out of 7 as per questionnaire requirements. Thus high level of knowledge was rated 4 and above out of 7 and low level of knowledge were rated 3 and below. The recorded knowledge of transmission was based on questions on: poor hygiene, drinking unsafe water, not washing hands and eating cooked food from vendors. Knowledge on typhoid preventive measures were based on questions on: washing hands with soap and water before eating and after using the toilet, drinking water from safe sources, washing fruits before eating them, proper disposal of waste, avoiding eating cooked food from vendors.

3.7. Ethical considerations

The study sought for the gatekeeper permission from the Harare City Council. The data was obtained from the Mbare residents including some relevant officials and in order to yield successful results, the following was done: informed consent, confidentiality, avoiding leading questions, use of vernacular language, avoiding interfering in the social private life of the participants, avoiding making promises of any form of gifts after the interviews and filling in of questionnaires. As part of confidentiality, respondents did not write their names or information that will lead to their identity to be known on questionnaires. The study also took note of the different cultural ethics in the society. Lastly; the participants had the freedom to withdraw from the study any time if they feel so.

3.8. Chapter summary

This chapter discussed research design and research instruments as well as sampling techniques which were used to collect data. The research was designed in a way that it accommodates both qualitative and quantitative methods, although qualitative research was dominating the research. Research instruments discussed include questionnaires, interviews, focused group
discussions and field observation. The use of different instruments in data collection allows
validity and reliability of the data collected as they complement each other.
CHAPTER FOUR: RESULTS AND DISCUSSION

4.1 Introduction

This chapter outlines the results and discussion. The results of the study were presented following the objectives and methods of the study and they were presented in form of graphs, charts and tables. The results were covering the assessment of knowledge, attitudes and practices related to typhoid and its management strategies in Mbare high density suburb of Harare, Zimbabwe

4.2 Demographic characteristics.

A total number of 5 key informants were interviewed 2 (40%) of the respondents were females and 3 (60%) were male. A total of 100 questionnaires were distributed and the responded questionnaires highlighted that more females (60%) participated than males (40%). The study indicates that the majority of the respondents were between the ages 21-40 followed by the age group 41-60. The lowest number of respondents were below 20 years (15%). This may be because most household heads are older than 20 as the study was targeting household heads.

4.3 Knowledge, attitudes and practices related to typhoid in Mbare

Generally there are moderate knowledge levels of the three distinct residents in typhoid prevention and transmission. From the three residencies 53% had high levels of knowledge and 47% had low knowledge levels. This shows that on average the community has at some point received health education and has adopted it. However, there is still a challenge on the levels of knowledge as 47% still lack knowledge in how typhoid must be prevented in their community.
The recorded knowledge of transmission were: poor hygiene (38%), drinking unsafe water (40%), not washing hands (12%) and eating cooked food from vendors (10%). Knowledge on typhoid preventive measures cited were: washing hands with soap and water before eating and after using the toilet (22%), drinking water from safe sources (45%), washing fruits before eating them (6%), proper disposal of waste (18%), avoiding eating cooked food from vendors (9%). This in general shows low levels of knowledge on specific aspects regarding transmission and prevention of typhoid in Mbare ward 4 residents.

4.3.1. **Comparison of KAP in different residential areas in Mbare**

The knowledge levels in Mbare differ by residential area as Annex has the highest percentage of people with higher level of knowledge of typhoid compared to Chishawasha and Matapi (Figure 4.2).
Matapi and Chishawasha flats have lower percentages of respondents with high levels of knowledge on typhoid specifically the causes of typhoid and how it should be managed. However there is evidence of high levels of knowledge in Annex residential area. Though they all indicated that they had received typhoid knowledge from Health promotion officers and IEC material hence the knowledge levels may also be affected by education levels as most respondents had only reached primary level.

Annex residential area has highest level of knowledge concerning typhoid and have access to information about typhoid and their views and perceptions also influence their knowledge levels of risk. In general, participants aged less than 35 years, those who were employed and those with some form of education (primary level or higher) were more likely to have better KAP of typhoid fever prevention and control methods.

With regards to gender, most females have shown to be more knowledgeable than males in all the study areas. Table 4.1 below shows the comparison of the knowledge levels related to typhoid by gender and residential area from the three distinct variables.

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**Figure 4.2 Comparison of knowledge levels of different residential areas.**

(Source primary data)
Generally females have high level of knowledge as compared to their male counterparts as shown in Table 4.1 above. Sixty two percent (62%) of females were more knowledgeable on typhoid prevention and transmission and only 38% had low level of knowledge about typhoid prevention and transmission. On the other hand, males (55% of them) had very low levels of knowledge on typhoid prevention and transmission. However 45% had high levels of knowledge which still can be attributed as low since most males are unaware of typhoid prevention and transmission.

4.3.2 Comparison of different attitudes in from residential areas.

Generally all the respondents had good or positive attitude towards the importance of prevention measures. However, some of the respondents had negative attitudes on the importance of typhoid prevention and transmission measures. Data was presented according to residential areas and the differences in how respondents perceived the importance of some prevention measures which also indicate their attitudes (Fig 4.3 below).
The practices of washing hands before eating and washing fruits and vegetables had low perceived importance by residents from Matapi and Chishawasha as most of the respondents regarded the practices as not necessary. The residents from Matapi and Chishawasha had negative attitudes regarding the perceived importance of prevention measures even on buying cooked food from vendors. However, most of the residents had positive prevention perceptions on having appropriate water storage containers. Annex had the highest positive attitudes in perceiving the importance of prevention measures and this has proved that attitudes are also linked to residential areas.

4.4 Practices related to typhoid

Generally, there were poor practices in the different residential areas especially in Matapi and Chishawasha as the two residencies had their reasons for poor practices which has also affected their behaviors towards typhoid prevention. However in Annex there were high levels of good practices that were identified. Fig 4.5 below shows the different reasons for poor practices that were identified.
It was noted that in Matapi and Chishawasha the residents use water treatment chemicals however they had no chemicals available in their homes at the time the study was carried out. Residents from Matapi indicated that some depend on borehole water and 4 (11%) indicated that they prefer using water from Mukuvisi as they were notified that some of the boreholes were contaminated. Also the respondents stated that boiling of drinking water was not a common option due to lack of resources for example non-payment of electricity bills and also unavailability of gas or firewood as fuel. Therefore, this shows that there are poor levels of good practices from residents in Matapi flats as their levels of knowledge on typhoid risks also affect their practices which in turn puts them at risk of contracting typhoid.

In Annex they mentioned use of taped buckets, good water storage containers including food stored in covered containers and also leftover cooked food are stored in the fridge. Also the residents indicated the boiling of water as a practice to reduce the risk of typhoid fever. This shows that residents in Annex have high levels of good practices relating to typhoid prevention and compared to Matapi and Chishawasha residents who have poor practices that make them more susceptible to the spread of typhoid.
It was also noted that there is a lot of improper waste disposal which is caused by poor council waste collection system in Matapi. This has led to residents throwing their waste on nearby open spaces when council fails to collect waste around the flats. One of the respondents from Matapi stated that,

“tinorasa marara chero patinoda nekuda kwekuti kanzuru haisi kutakura mabhini saka zvangofanana nekurasira pese pese sezvo zvimbo yatiri kugara yakazara tsvina uye nekuti tawandisa marara achowo anowandisawo”.

Meaning that they will keep on practicing poor waste disposal as a result of poor waste collection by the Council and also due to the fact that there is an increase in population waste generation will also increase. Plate below shows some of the waste deposited around Matapi flats.

Plate 4. 1 Waste disposal around Matapi flats (Source: Primary data)

The respondents in Matapi indicated several reasons for not treating water and these include the belief that borehole water is safe henceforth they find no need to treat it, regular shortage of electricity to boil water for drinking and most of them cannot afford high costs of electricity for boiling drinking water. Consistent unavailability of chemicals to treat water is one of the major reasons for not treating water in Mbare high density suburbs. Some respondents (12%) indicated that they have never fallen sick from untreated water hence forth they do not see the
reason to treat water before consumption. This shows that different poor practices may increase
the susceptibility towards contracting typhoid fever.

In Matapi and Chishawasha they do not perceive the practicing of good hygiene and sanitation
as typhoid risks due to their different reasons. Some (16%) stated that when toilets are not in
use they use the bucket system which in turn exposes them to high risks of contracting typhoid
and there is nowhere else to go because of pressure on resources as other toilets from other
blocks will be in use. Also some perceive the practice of proper waste collection is of no
significance as a result of non-collection of waste by the council.

4.5 Effectiveness of typhoid risk management strategies

Generally the typhoid risk management strategies that were implemented per household or for
the community in general were reported to be effective. Fifty four percent (54%) of the
respondents noted that the strategies were effective which is a good percentage however, 46%
reported that these strategies are not effective. Fig 4.5 below shows the frequencies of the
responses on the effectiveness of different strategies that were implemented to reduce typhoid
fever in the three distinct areas in Mbare.

![Effectiveness of typhoid risk management strategies](source: primary data)

**Figure 4.5 Effectiveness of typhoid risk management strategies** (source: primary data)
In Mbare boreholes have been installed and the water is treated a risk management strategy. This strategy has proven to be effective in typhoid risk reduction as alluded by respondents from all residential areas (78%). However, a few (22%) still perceive borehole water to be unclean. Provision of water treatment chemicals was identified to be effective (56%) and 44% perceive it not effective as a result of non-availability of water treatment chemicals. Most of the respondents (82%) noted that health education is most effective in reducing typhoid risks. Waste collection was rated the least effective as respondents complained about poor waste collection. Below is a picture of a borehole installed in Annex.

![Plate 4. 2 Borehole in Annex](Source: primary data)

Seventy percent (70%) of the respondents alluded that they were not treating their drinking water. Therefore, even when strategies are implemented there are high chances of them not being effective as people’s knowledge, attitudes and practices tend to affect their effectiveness. In Annex they indicated that NGOs like UNICEF frequently treat their borehole water and they are given water guards to treat their water for household use.

The key informants indicated that the measures put against Typhoid are not very effective. This was worsened by overpopulation in Mbare especially the Matapi area. The council officials mentioned that there is ever increase in population in the area. The population is exceeding the normal carrying capacity of the flats. Hence general sanitation behaviour is not controlled and also the sewer system does not fit to the population of the area. This led to bursting of sewer
pipes because the system will be overloaded. Henceforth it is always difficult to fight against Typhoid.

Thirty four percent (34%) of the residents in Matapi have indicated that vending does not increase prevalence of typhoid thereby promoting an increase in poor practices and negative attitudes. Whereas in Annex they indicated that they try to avoid buying food from vendors as they perceive it as a risk. Twenty seven percent (27%) of residents in Matapi and Chishawasha state that, high levels of poverty in Mbare is one the major causes of the spreading of Typhoid as most people in Matapi and Chishawasha depend on vending as a source of livelihood however, this has also affected the effectiveness of typhoid risk reduction strategies as vending of cooked food was banned as a way to reduce the prevalence of typhoid. Therefore, some of the risk management strategies implemented should also involve the community as residents in Matapi and Chishawasha have different perceptions on vending as a typhoid risk factor thus influencing their differences in knowledge, attitudes and practices.

Most of the residents in Matapi (64%) and Chishawasha (56%) cannot afford water treatment chemicals. On the other hand most residents from Annex (76%) can afford water treatment chemicals hence that area is less vulnerable to the risk of typhoid. Thus there is need to provide water treatment chemicals for these residents frequently so as to reduce the prevalence of typhoid in the area. However, generally most typhoid management strategies were considered effective in areas like Annex and in some households from Matapi and Chishawasha as this has contributed to the decrease in typhoid cases per household level.

4.6 Ways of improving typhoid risk management strategies.

Three main typhoid risk management strategies were recorded from all the residential areas in Mbare are presented in Figure 4.6 below.
When the respondents were asked how best typhoid risk can be managed, those from Annex proved to be more knowledgeable than those in Matapi and Chishawasha. However, the respondents highlighted the need to have more education and awareness campaigns on typhoid related issues so as to be alert and aware of what is expected of them to promote the reduction of typhoid in Mbare. The respondents also suggested that there should be provision of water treatment chemicals frequently per household level. Also the treatment of borehole water so as to avoid drinking contaminated water and frequent waste collection which might help them in identifying the proper waste disposal areas.

Some of the suggestions were gathered through interviewing of the key informants that included officials form from the Ministry of Health and the Harare City Council. The main suggestions include: introduction of health education programmes, changing of individual behaviour by dispatching messages that are effective for positively influencing desired preventive attitudes and practices: provision of water treatment chemicals, fitting of inline chlorinators and maintaining frequent servicing and proper disposal of waste in sites that were designated.
4.7. DISCUSSION

Generally, knowledge levels related to typhoid fever prevention and transmission in Mbare area are moderate. Knowledge levels may have been influenced by residential area and gender as women have high levels of knowledge regarding the prevention and transmission of typhoid fever. As a result poor knowledge levels may promote the increase in frequency of typhoid disease spread in Mbare especially in areas with low knowledge levels as the residents will be exposed to risks. The major reason why the residents have less knowledge is mainly because of limited access to information especially the male counterparts who spend most of their time out looking for a means of living. A KAP study by Muti et al., (2010) in Glenview gathered low proportions had good knowledge levels despite the fact that the respondents had all received health education. Meaning that the population might have been mobile and might have missed the health education programmes. These results corroborate with the results of this study as evidence has gathered that most of the residents had received health information though the levels of knowledge were poor.

The researcher tried her best to come up with a balancing gender representation of the respondents however, participation at household level was noted in females as the time of the study was carried out as most women were home and a few males were available during the time of the research. This is mainly because women attend community health programs that educate them on issues of typhoid and also as a result of their cultural gender roles of care giving women are more alert as they are the ones who cook, and spend most of their time at home where they receive health education and in turn protect and teach children on how best typhoid can be prevented. However, men are more ignorant about typhoid related issues because they are always busy to attend programmes. Gender is also vital in identifying the group that is at risk as the most knowledgeable gender (females) is likely to be more aware of the typhoid risk and can use the knowledge to prevent or respond to the disease. However the other gender (males) may be vulnerable to the disease as they may be exposed to the disease unaware as a result of lack or little knowledge regarding the typhoid disease. Thus, the study shows evidence that people who spent longer time in Matapi flats have been exposed to hygiene promotion activities and have adopted good hygiene practices and this was indicated by the high levels of knowledge most women have and also the fact that the study was female dominated (Table 4.1).
Also as a result of the different perceptions on typhoid prevention and transmission the knowledge levels are also affected. For example males perceived washing hands before eating or buying cooked food from vendors had no relationship with typhoid transmission which therefore influences their attitudes and practices. However, knowledge on the importance of handwashing was good and perceptions of hand washing as one of the means of preventing typhoid was high. Actual practice of washing hands was reported by large proportions. However the majority were not using soap for hand washing due to economic reasons. With regards to previous studies done in Glenview by Bara et al., (2016) show that the practice of washing hands was generally good which shows that this practice is common and has been adopted by several households. However with regards to this study the practice of washing hands before eating has been regarded to be low in males as they perceive it not important for prevention of typhoid and this is also influenced by the different residential areas. On the other hand, a study by Nahimana et al., (2017) in Burundi refugee camp indicated that, poor hand-washing practices might be linked to gaps in the health information provided to the community by the hygiene promoters. Hence there is need to promote an increase in provision of health education and promote good practices in both female and males so as to promote behavioural change for both gender groups and all residential areas that might be exposed to risk.

The attitudes of respondents towards the prevention of typhoid fever was negative in Matapi and Chishawasha where there was more negative attitude to typhoid risk perceptions. However in areas like Annex there was more positive attitudes in all prevention measures as there were quite aware of the importance of typhoid prevention. This shows that there is need to integrate typhoid risk reduction measures in areas like Matapi and Chishawasha so as to increase knowledge on the importance of typhoid prevention which in turn will improve their attitudes towards typhoid prevention. Thus in settings where there is a high concentration of population, constant repetition and reinforcement of information is required to achieve behavioural change as this will promote high levels of awareness in turn reducing risks.

Practices regarding the prevention of typhoid fever were low in Matapi and Chishawasha however in Annex there were good practices in relation to typhoid fever. Practices such as poor waste disposal were common in Matapi and Chishawasha This therefore will affect their practices towards proper waste disposal leading to an increase in exposure to typhoid disease as children are also left to play in such conditions as a result most children will be affected. Therefore, it is of great importance to understand the reasons behind poor practices towards prevention of typhoid fever as this affects how people react towards its prevention. The City
council must therefore, promote an increase in frequency of waste collection so as to promote the reduction of poor waste disposal from households.

In general, this shows the difference in levels of attitudes and practices as the residents in Annex are more aware of the importance of good levels of knowledge, attitudes and practices despite the fact that they live in an area that is highly at risk of typhoid. Thus there is a difference in in risk management strategies per households in these various areas as some do not take typhoid prevention and transmission seriously. High risk perception is generally associated with precautionary and preventive measures thus, the perceived seriousness of a disease shapes the health seeking behaviour of a community (Bara et al., 2016). The three different residencies have proven to have different rates of knowledge, attitudes and practices in relation to typhoid and its management strategies as the difference in perceptions exposes the different households to typhoid risks leading to an increase in frequency of typhoid outbreaks in some residencies though they are in the same area (figure 4.3).

The key informants agreed that if the difference in knowledge attitudes and practices of residents also affects the effectiveness of the typhoid risk management strategies hence increasing their susceptibility to typhoid risks. Also, there is need for the Council to be more proactive than responsive so as to instil a change of behaviour in community’s KAP in both disaster situations and normal situations.

4.8 Limitations to the study

The study had limitations on gender bias as most of the respondents were females. This might have been affected by the time the research was carried out as most male household heads were not available and this could have led to distortion of information regarding their knowledge attitudes and practices relating to typhoid in the communities. Also the study was done after the outbreak period was over hence there may be irregularities in the information provided on knowledge, attitudes and practices as most people had received education and probably and started adopting the prevention measures and their answers were probably guided by the health education information they had just received.
4.8 Chapter Summary

This chapter has outlined the results, discussion and limitations of the study. The study gathered that level of knowledge, attitude and practices on typhoid, varies from place to place within Mbare high density suburbs. The key findings of the study gathered that good attitudes on typhoid and good practices in relation to typhoid was low in Matapi and Chishawasha sections. The respondents from Annex perceived to be more knowledgeable in every aspect concerning typhoid prevention and spreading. The key informants alluded that knowledge, attitudes and practices negatively impact on prevention and control of typhoid as evidenced by high cases of typhoid prevalence in Matapi and Chishawasha.
CHAPTER FIVE: SUMMARY CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter presents the summary on the research, conclusion and recommendations of the study. Opportunities for further research are also suggested.

5.2 Summary

The study confirmed low levels of knowledge, attitudes and practices relating to typhoid fever and its management in Matapi and Chishawasha flats compared to Annex in Mbare. Typhoid fever prevention and control activities in the Matapi and Chishawasha areas proving that the residents are quite aware of the typhoid outbreak as people had received health education but there is need for positive behavioural change so as to promote good household attitudes and practices. Thus, practice methods of key hygiene activities, such as hand washing with soap and water, were observed to be inadequate by some of the male respondents from Matapi, which may be a plausible reason for the prolonged transmission of Salmonella Typhi in Matapi flats. However, it is quite different in the Annex area as there is high KAP level leading to a reduced typhoid prevalence in this area.

These findings highlight that outbreak response interventions in the study population, particularly hygiene education, were effective in areas such as Annex as there is very low typhoid disease prevalence. This shows that even though there are management strategies that are being implemented in the affected area in Mbare there is still a challenge in Matapi and Chishawasha respondents reacting positively to the health education as it is still a challenge in promoting an increase in knowledge and good attitudes and practices due to variations in perceptions of typhoid risk by respondents. However in areas such as Annex where there are flats and detached houses, there are high rates of awareness in terms of knowledge attitudes and practices as they agreed on most of the typhoid prevention strategies suggested in the questionnaires. Also residents from Annex have adopted most of the typhoid prevention measures such as the boiling and treatment of water for drinking proving an increase in risk knowledge and positive attitudes towards typhoid risk reduction per household level.
Moreover, the typhoid risk management strategies that have been implemented may have been partially effective as there is need to address the root causes of the increase in number of typhoid cases after the implementation of the strategies. Most residents from Matapi and Chishawasha noted that the strategies are only implemented during outbreak phase. Hence there is need for frequent distribution of water treatment chemicals, waste collection and also health education and promotion so as to keep the community alert and aware of risks that may expose them to typhoid. House-to-house hygiene promotion, should be the main source of health education as all the residents from the three areas highlighted the need for health education hence, there is need to promote house hold risk and prevention education in Matapi, Chishawasha and Annex. These measures in general may instil a feeling of change in behaviour leading to a decrease in typhoid prevalence in Mbare.

5.3 Conclusion

Outbreaks of communicable diseases such as typhoid fever significantly contribute to increased morbidity and mortality in high density suburbs where there is increased population growth. Generally, findings showed that knowledge, attitudes and practices towards typhoid fever prevention and control was low among the study population, which may have contributed to the prolonged transmission of typhoid in the area especially in the Matapi and Chishawasha flats which is quite different from Annex. However, very good knowledge, attitude and most importantly, consistent and correct practices of proper hygiene and sanitation methods are critical to the prevention and control of typhoid outbreaks in high density suburbs. Most residents in Mbare (Matapi and Chishawasha) are exposed to typhoid disease as a result of their poor levels of knowledge, attitudes and practices which constitutes their behaviour in terms of prevention and response. This promotes negative behavioural change within a community or per household. The study findings have shown that in such settings where there is a high concentration of population, constant repetition and reinforcement of health information is required to achieve positive behavioural change as health information will constantly remind them of what is expected per household level to reduce typhoid prevalence in their area.

5.4 Recommendations

- During future outbreaks, specific groups, such as males should be targeted to receive appropriate hygiene, sanitation and health information so as to promote positive behavioural change in terms of attitudes and practices related to typhoid fever.
• Health Promotion Officers should implement the reinforcement of health education, hygiene promotion strategies and social and individual behaviour change messages that are effective for positively influencing anticipated preventive attitudes and behaviours in Mbare.

• Environmental health officers to create projects and programmes that will help educate the residents on how to control and prevent typhoid fever effectively in the area for example waste recycling projects which in turn can change their attitudes and practices.

• Promotion of point of use water treatment and provision of water treatment chemicals per household level so as to promote prevention strategies as some practices are influenced by lack of access to water treatment chemicals regularly. NGOs should promote the fitting of inline chlorinators and their subsequent regular servicing and also treatment of borehole water to remove the different perceptions of borehole water by Mbare residents.

• Future research on the aspects of knowledge, attitudes and practices on typhoid related issues is needed especially in densely populated areas because sometimes implementing risk reduction measures without understanding the community’s different perspectives may be of no significance. Also to investigate on how the community consumes risk reduction information which shows what action is taken by the community when the warning is issued paying attention to perception and behavioural responses to typhoid disease.
REFERENCES


36. United Nations International Strategy for Disaster Risk Reduction (UNISDR 2009) *terminology on Disaster Risk Reduction*


APPENDICES

APENDIX 1: QUESTIONNAIRE GUIDE

My name is Pamela C.M. Matswetu a fourth year student at Bindura University of Science Education doing Bachelor of Science Honours Degree in Disaster Management. It is a pre requisite for final year students to undertake research project and I am carrying out a research on the **AN ASSESSMENT OF KNOWLEDGE, ATTITUDES AND PRACTICES RELATED TO TYPHOID AND ITS MANAGEMENT STRATEGIES IN MBARE HIGH DENSITY SUBURB IN HARARE, ZIMBABWE**. I am appealing for your assistance, contributions and relevant information regarding to the research. The aim is to understand your knowledge, experience and perceptions of typhoid related issues. Responses will be strictly presented privately and confidential to pursue academic fulfilment.

Date of completion .................. Respondent No.........................

Instructions:

- Please fill in the space provided
- Place a tick where appropriate

<table>
<thead>
<tr>
<th>SECTION A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Sex</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

2. Age group

<table>
<thead>
<tr>
<th>15-25 years</th>
<th>26-35</th>
<th>36-45</th>
<th>46-55</th>
<th>56-65</th>
<th>66-75</th>
<th>76 and above</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Marital status

<table>
<thead>
<tr>
<th>Single</th>
<th>Married</th>
<th>Divorced</th>
<th>Separated</th>
<th>Widowed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Level of education

Primary □ “O’ Level □ “A” Level □ Tertiary □
Other…………………………

5. Employment status

Employed unemployed Self-employed

6. Any other forms of income?

………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………

7. Household/ family size

□

b. Family members age groups

<table>
<thead>
<tr>
<th>0-5 years</th>
<th>6-15</th>
<th>16-30</th>
<th>31-45</th>
<th>45-60</th>
<th>61 and above</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. How many families live in your house?

<table>
<thead>
<tr>
<th>1 family</th>
<th>2 families</th>
<th>3 or more</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. How long have you lived in Mbare

<table>
<thead>
<tr>
<th>&lt;1 year</th>
<th>1-5 years</th>
<th>6-10 years</th>
<th>11-15 years</th>
<th>+16 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SECTION B: Knowledge Assessment on typhoid fever

10. Have you ever received health education on typhoid fever?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10b. if yes, please indicate source

<table>
<thead>
<tr>
<th>Source of education</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health workers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends/ church/ IEC material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health promoters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Newspapers and radio / television</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other: specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. What are the sources of transmission of typhoid in your area?

<table>
<thead>
<tr>
<th>Source of transmission</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad hygiene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking unsafe water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not washing hands with soap after using the toilet and before eating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eating cooked food from vendors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not washing fruits before eating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor waste disposal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other: specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. What do you do to prevent typhoid in your area?

<table>
<thead>
<tr>
<th>Prevention measure</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing hands with soap and water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drinking water from safe sources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proper waste disposal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoiding eating cooked food from vendors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washing fruits before eating them</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other: specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13. Where do you get water to use in your homes?

<table>
<thead>
<tr>
<th>Water sources</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Borehole
Buy water
Other: specify

13b. what do you do to make water safe for drinking?

<table>
<thead>
<tr>
<th>Method</th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boil water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water guard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aqua tab</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleach</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Store water in closed/ taped containers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other: specify</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Section C: Typhoid risk factors per household level

14. Can you remember about the typhoid situation between October 2016 and January 2017?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

15. Do you experience bursting of sewer pipes in your community?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
</table>

b. If Yes in 15(a) how often do you experience bursting of sewer pipes within 100m from your house?

<table>
<thead>
<tr>
<th>Daily</th>
<th>&gt;1 week</th>
<th>1-2 weeks</th>
<th>2-3 weeks</th>
<th>1 month or more</th>
<th>Never</th>
</tr>
</thead>
</table>

c. How long does it take for the Council to respond/ fix?

<table>
<thead>
<tr>
<th>Immediately</th>
<th>1-2 weeks</th>
<th>2-3 weeks</th>
<th>1 month or more</th>
<th>Never</th>
</tr>
</thead>
</table>
16. Do you experience short supply of piped water?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. How often do you experience short supply of piped water in your house?

<table>
<thead>
<tr>
<th>&gt;3 days</th>
<th>4-7 days</th>
<th>8-14 days</th>
<th>15-21 days</th>
<th>monthly</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

c. Reasons for short supply of water

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-payment of bills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breakdown of water supply system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water rationing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure on resources</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. If its non-payment how long do you normally go without payment?

........................................................................................................................................................................................................

c. If its breakdown, how long does it take for the Council to fix it?

........................................................................................................................................................................................................

d. If its water rationing, what is the schedule like?

........................................................................................................................................................................................................

17. What kind of toilet system do you use?

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
<th>Number of families sharing the toilet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common toilet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private toilet</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. If common toilet, who is responsible for cleaning and what is the source of water in case of short supply of piped water?

........................................................................................................................................................................................................

........................................................................................................................................................................................................
c. In case of toilet breakdown what do people use?

…………………………………………………………………………………………
…………………………………………………………………………………………

18. What do you think should be done to promote the effectiveness of KAP related to typhoid in your community?

…………………………………………………………………………………………
…………………………………………………………………………………………
…………………………………………………………………………………………

End of questionnaire

THANK YOU.
APENDIX 2: KEY INFORMANT INTERVIEW GUIDE

Interviewer: MATSWETU PAMELA C.M

This interview collects information about the Knowledge, Attitude and Practices of Mbare residents related to typhoid and the measures that were implemented to reduce the prevalence of typhoid.

For Harare City Health department, and MOHCC

1. What are the KAP of Mbare residents?
2. Who are the most affected by typhoid fever?
3. What are the effects of typhoid fever in Mbare?
4. What are the main typhoid risk factors in Mbare?
5. What typhoid risk management strategies have you introduced to combating typhoid fever in Mbare?

<table>
<thead>
<tr>
<th>YES</th>
<th>NO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste management</td>
<td></td>
</tr>
<tr>
<td>De-blocking of sewer systems</td>
<td></td>
</tr>
<tr>
<td>Provision of clean tap water</td>
<td></td>
</tr>
<tr>
<td>Provision of borehole water</td>
<td></td>
</tr>
<tr>
<td>Provision of water treatment chemicals</td>
<td></td>
</tr>
<tr>
<td>Awareness campaigns</td>
<td></td>
</tr>
<tr>
<td>Banning of vending</td>
<td></td>
</tr>
<tr>
<td>Education on personal hygiene</td>
<td></td>
</tr>
<tr>
<td>Others: specify</td>
<td></td>
</tr>
</tbody>
</table>

6. Did the community adjust to these strategies you brought forth?
7. Are these risk management strategies effective in any way?
8. How have these strategies reduced the prevalence of typhoid fever in Mbare?
9. What challenges have you been facing in implementing these strategies?
10. What do you think should be done to promote the effectiveness of KAP related to typhoid and management strategies in Mbare?

THANK YOU.