MANAGEMENT OF CHILDREN’S FAECAL MATTER AND ITS IMPLICATIONS FOR
CHOLERA OUTBREAK IN THE CAPE COAST METROPOLIS

BY

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DEDICATION

To my sweet mother and auntie, Mrs. Deborah Asabea and Mrs. Joan Adjei for their great support towards my education and also to the entire family for their encouragement and advice.
DECLARATION

I hereby declare that this work is the result of my own original research and that no part of it has been presented for another degree in the university or elsewhere.

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ABSTRACT

Ghana as a country is faced with series of sanitation problems, especially in the area of human faecal management. Improper handling and disposal of faecal waste has resulted in the outbreak and spread of diseases such as Cholera. Cape Coast Metropolis, which houses the capital of the Central Region of Ghana, faces such challenges as lack of toilets in various households, poor sanitation and crowded areas. Disposal of children’s faeces has therefore become an area of concern in the Metropolis since mothers and other child caregivers resort to indiscriminate and untraditional methods of children feces disposal due to lack of improved toilet or latrine, which can become a vehicle for the outbreak and spread of Cholera. The study sought to assess disposal of children’s faecal matter in households and how it contributes to Cholera outbreak within the Cape Coast Metropolis. The study employed the mixed methods research approach and employed both primary and secondary data. A Multi stage sampling method was used to select the population for the study and stratified sampling was used to group the Metropolis into three, based on income level. The purposive and simple random sampling methods were used to select one community each from each stratum. 331 respondents were used for the study. This included 300 households, 10 opinion leaders, and 21 women for focus group discussion. Data was coded and analyzed with SPSS, where descriptive statistics such as frequencies, percentages, chi square and regression were employed to explain the differences, relationships and association between variables. The study revealed households with unsafe children’s faecal matter disposal to be at high risk of getting Cholera, but the relationship was not significant. However, it was statistically proven that households who bought food outside were at higher risk of getting cholera. It is therefore recommended that Food and Drugs Board Authority together with Standard Authority ensure food vendors get the necessary permit before selling any food. And there should be a constant check up on food vendors concerning containers for selling food, environment in which food is sold and personal hygiene of these vendor.
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ABBREVIATIONS

CCMA – Cape Coast metropolitan Assembly
CDD – Centre for Democratic Development
CHERG - Child Health Epidemiology Reference Group
CWSA – Community Water and Sanitation Agency
DESF – District Environmental Sanitation Fund
ESP – Environmental Sanitation Policy
GDP – Gross Domestic Product
GHS – Ghana Health Service
GSS – Ghana Statistical Service
ICCDR – International Centre for Diarrhoea Diseases Research
MLGRD – Ministry of Local Government and Rural Development
MMDA - Metropolitan, Municipal, District Assembly
MOH – Ministry of Health
MPC – Metropolitan Planning Committee
NDPC – National development Planning Committee
NESPoCC – National Environmental Sanitation Policy Coordinating Council
OCHA – Office for Coordination of Humanitarian Affairs
SDG – Sustainable Development Goal
UNDP – United Nation Development Programme
UNICEF – United Nations International Children’s Emergency Fund
WHO – World Health Organization
WSP – Water and Sanitation Program
CHAPTER ONE

1.1 Introduction

Human faecal waste can be very infectious when improperly disposed and poses serious health hazards such as soil pollution, water pollution, and spread of diseases to human population (Carr, 2010; WHO, 2010). Its management globally and especially in developing countries has become worrying in recent times. The Joint Monitoring Program for Water Supply and Sanitation (JMP) statistics in 2012 indicated that 2.6 billion individuals worldwide do not have access to better sanitation, of which one billion people resort to open defecation (WHO & UNICEF, 2014). This may not include the disposal of young children’s faeces. Mostly, children’s age and stature prevent them from using toilets or latrines. This results in the use of other means by household’s in the management of child waste which could pose health and other social challenges (WHO & UNICEF, 2014).

An analysis by UNICEF reveals that more than 50% households with children under age three worldwide have unsafe disposal of children’s faecal matter. Such unsafe disposal of child’s faecal matter can be found in households with good sanitation (UNICEF, 2014). Research shows that the faecal waste of 79% of children below 5 years in India was not disposed properly, which increased the likelihood of infection of children with diseases (Bawankule, 2017). Cholera outbreak globally in many countries worldwide has become a very worrying health trend in recent times. A person gets infected with cholera when substances which have been contaminated with the cholera causing bacteria (v. cholera) enter into the body through the consumption of food or water. The bacteria thrive in water bodies, moist earth and mostly in the stools of infected persons (Osei et al., 2012). In addition, “High population density, poverty, poor sanitation, poor housing and lack of good water supply lead to the outbreak and spread of cholera” (Osei, 2010). Healthy adults can die in as little as three to
twelve hours after the first showings of symptoms if treatment is not promptly administered (Dziedzom, 2015). Globally, many lives have been lost as a result of cholera infection (Osei, 2010). Over one million cholera cases and 28,000 deaths were recorded worldwide from 1999 – 2005 (Osei et al, 2012).

In Africa, especially Sub-Saharan Africa, population increase has influenced faecal matter disposal practices. About 215 million people resort to open defecation, and this is because available toilet facilities are not enough to cover the growing number of the population. A study showed that, there was 33% increase in the number of people who engage in open defecation (Galen et al., 2013). Studies indicate that, children’s fecal matter can be safely disposed when access to faecal facilities are better and reliable, where children are able to use them and also faeces is emptied and/or rinsed into toilets or buried after being rinsed. On the other hand, an unsafe children’s faecal disposal is when faeces is disposed into drain, garbage, and open, thrown into the soil or buried in an open space (Bawankule, 2017; Preeti et al., 2016). For instance, a 2016 study conducted in 25 developing countries revealed that more than 50% of households unsafely disposed of the faeces of children. Some of these countries include Malawi, where 21% household practiced unsafe faecal disposal and 11% of households in Zambia practiced unsafe faecal disposal (Morita et al., 2016). In 2015, 172,454 cholera cases were reported, with 41% occurring in Africa alone. This indicates the prevalent rate of faecal matter disposal challenges and cholera (Lessler et al., 2018). The United Nations Office for the Coordination of Humanitarian Affairs (OCHA) noted that cholera outbreaks in 2015 in Africa were pandemic and had a higher tendency of recurrence. For instance, from 2007 to 2013, Nigeria experienced 91,090 cases of cholera with 3,358 deaths which was a results of unsafe disposal of faecal waste (Ujah et al., 2015). Cholera continues to claim many lives with higher potency. Although a lot of financial resources (for instance USD 1.2 million in 2012) have been
expended on the treatment of cholera, much attention has not been given to the causes and the mode of spread of the disease (WHO & UNICEF, 2014).

The situation has not been any different in Ghana where there have been consecutive and continual outbreaks. From 1999 to 2005, Ghana recorded 26,000 cases of cholera which resulted in 620 deaths (Useya, 2011). Also, a situational report by the World Health Organization on cholera outbreak in the ten regions of Ghana indicate that from October 5 to December 28, 2014, a cumulative total of 28,955 cases and 243 deaths were recorded, with Greater Accra Region recording the highest number of cases (20,199) and the Central Region reporting the second highest number of cases (3,846) (Dziedzom, 2015). A study conducted in the Greater Accra Region of Ghana showed that 72% of cholera outbreaks were as a result of improper stool disposal and contaminated stool (Dzotsi et al., 2015). For instance, according to a study conducted by Kosoe and Osumanu (2013) in Wa, inadequate children friendly toilet facilities have led to open defecation by children, tantamount to improper children faecal management. In Ghana, some of the equipment used to handle children’s faecal matter includes chamber pot, diaper, and black polythene bag. Assessment of children’s faecal disposal, according to O’Connell (2015), is vital in the sense that, when improperly disposed, it poses health risk (disease burden) to communities. Important determinants of faecal matter disposal include times of the day, where the child defecates (e.g. at home or outside home), and the care-giving after the child defecates.

A majority of these outbreaks have been recorded in the coastal regions of Ghana, with the Central Regional Health Directorate recording a little more than 500 cholera cases between 24th October and 27th November 2016. Out of this, Cape Coast Metropolis alone recorded 172 cases (WHO, 2016). The coastal areas have been characterized by poor sanitation, improper waste management, lack of improved toilet or latrine and haphazard treatment of water bodies. These factors have become the catalyst for the outbreak and spread of cholera.
therefore the need for safe disposal of children’s faecal matter in order to ensure healthy environment and protection of the health of the population.

1.2 Problem Statement

The role of sanitation in health is very vital in a country’s growth and development. A country without good sanitation faces series of health challenges such as cholera (Musah, 2018). Ghana lacks facilities for sanitation promotion and this is evidenced by how most households dispose of their waste at public dumps, either in containers or in open spaces (GSS, 2014). There are low proportions of households with water closet (WC), and very few also use pit latrines while there are still several households without any form of decent toilet facilities (GSS, 2014). A total of 4.8 million of Ghana’s population have no latrines and defecate in the open space while another 16 million use unsanitary or shared latrines (WHO & UNICEF, 2014). The problem of open defecation alone, contributes to about 20% of sanitation problems in Ghana (Word Bank, 2010). Out of the 1,800 cases of cholera that affected children aged less than 5 years in Ghana, faecal matter contamination was identified as root cause (WHO, 2005-2009).

The methods of convenience adopted by members of such households always pose a threat to the health of other members in the community which in turn affects productivity and development negatively (Musah, 2015). Improper disposal of children’s faecal matter could play a major role in the outbreak and spread of cholera. The faeces of infants and young children could be more harmful than adults’ due to a higher prevalence of pathogens (WHO & UNICEF, 2014). Children’s faeces, when not properly managed, can pose severe health risk on the community which includes loss of lives, morbidity and increased rate of disease burden. Without cholera, there are so many diseases already burdening many poor households such as HIV, Malaria, Typhoid and others. Increase in cholera exacerbates the disease burdens facing
communities. Resources have to be used in curing the diseases and people have to evacuate from work for treatment, which then affects productivity and development (Osei, 2010).

Cape Coast Metropolis, which is the capital of the Central Region of Ghana, faces such challenges due to the lack of toilets in various households, poor sanitation and crowded areas (Awere et al., 2016). An annual composite report on CCMA by Metropolitan Planning Committee in 2014 indicated that, the metropolis has challenges with proper waste disposal and sanitation. Inadequate knowledge on proper disposal has led households and residents to resort to their own dump sites which are mostly found along roads, on top of hills, along banks of streams, lagoons and beaches (MPC, 2014). Due to insufficient toilet facilities, disposal of children’s faeces in the metropolis has become an area of concern since mothers and other caregivers resort to indiscriminate and untraditional methods of children faeces disposal. Children’s faeces, which is not disposed properly, sometimes find its way into various water bodies, household items and skin of the disposer which eventually can become the vehicle for the outbreak and spread of diseases such as diarrhea, cholera, and others.

While a number of studies have examined the causes, effects and mode of transmission of cholera, and others examined the role of appropriate toilet facility provision in deprived communities in reducing the problem, very little studies particularly in sub-Saharan Africa have examined the contribution of children’s faeces management in cholera outbreaks (Dzotsi et al., 2016; Ohene-Adjei, 2015; Ruiz-Moreno et al., 2010). For instance, (Ohene-Adjei 2015; Dzotsi et al, 2016; Opare et al, 2012 & Osei, 2010) postulated that lack of adequate hygiene, limited access to safe drinking water, lack of safe food intake, overcrowding and inadequate sanitation systems are some of the causes of cholera outbreak. Even though scholarship identified these factors as causes of cholera, there is limited extant literature discussion of improper children faecal management as one of the root causes of cholera. Furthermore, Ruiz-Moreno et al., (2010) discussed transmission of cholera and concluded two main ways of
transmission. These were primary (from polluted water) and secondary (from an infected person) transmission. Although (Ruiz-Moreno et al., 2010) addressed several modes of cholera transmission, they could not address the role of improper children faecal management in cholera transmission. A research program on water and sanitation which focused on child faecal disposal practice in India, Pakistan, Nigeria, Philippines, Uganda, Zambia and Burkina Faso tried to analyse the disposal of children faecal matter in relation to diarrhea and the child’s health (UNICEF/ World Bank, 2015). Even though it was found that there was high rate of unsafe disposal of child faecal matter, they could not address what safe and unsafe practices existed for households and associated factors that could improve households Children’s faecal management.

Therefore, a study on how children’s faeces are being managed by these households and what role the different ways of managing children’s faeces could contribute to cholera outbreaks should be of high concern. This study therefore seeks to examine the management of children’s faecal matter in the Cape Coast Metropolis and its implications for cholera outbreak.

1.3 Research Questions

1. What is the current state of sanitation in the Cape Coast Metropolis?
2. How are children’s faecal matter being disposed of in Cape Coast Metropolis?
3. How does the disposal of children faecal matter make households in Cape Coast Metropolis more vulnerable to cholera spread?
4. What effective ways should households in vulnerable communities adopt to manage children faecal matter?

1.4 Research Objectives

The main objective of the study is to assess the disposal of children’s faecal matter and its influence on cholera outbreak in Cape Coast Metropolis.
The specific objectives are:

1. To examine the current sanitation state of Cape Coast Metropolis.
2. To assess children’s faecal matter disposal practices and associated factors in Cape Coast Metropolis.
3. To analyse the relationship between household exposure to children’s faecal matter in Cape Coast Metropolis and spread of cholera.
4. To recommend innovative and effective ways of managing children’s faecal matter in vulnerable communities in Cape Coast Metropolis

1.5 Hypothesis

1. \( H_0 \): There is no significant relationship between methods of children’s faecal disposal and socio-economic factors in Cape Coast Metropolis.
   \( H_A \): There is a significant relationship between methods of children’s faecal disposal and socio-economic factors in Cape Coast Metropolis.

2. \( H_0 \): There is no significant relationship between cholera and methods of children’s faecal disposal in Cape Coast Metropolis.
   \( H_A \): There is a significant relationship between cholera and methods of children’s faecal disposal in Cape Coast Metropolis.

1.6 Significance of the Study

The research will add knowledge to faecal waste management in Ghana. It will also be of interest to prospective researchers, as it will serve as a point of reference material on faecal waste disposal and the influence it has on cholera. The work will add to issues on Cholera. It will enable the Cape Coast Metropolis have access to results and recommendations in their future cholera resilience policy, as it will be a guide for households in the community on the proper way of managing their children’s faecal waste. Also the importance of the research to
the government and other policy makers such as WHO in cholera control program cannot be ruled out. It will add to evidence and create awareness on children’s faecal matter disposal practices in urban areas. It will contribute to achieving Sustainable Development Goal 6 and finally contribute to the improvement of health and socioeconomic development in the Cape Coast metropolis.

1.7 Organisation of Study

The study is organised into six chapters. The first chapter comprises introduction, statement of problem, research questions, and objectives of the study, propositions and significance of the study. The next chapter which is chapter two discusses literature related to the study by reviewing them. This includes the theoretical and conceptual matters underpinning the study. Chapter three looks at the research methodology which includes the study area, sampling techniques and procedure, research instruments, data collection and analysis. The fourth chapter presents result of household’s demographic background, state of sanitation and methods of children’s faecal disposal. Chapter five is also focused on results of household’s exposure to children’s faecal matter and spread of cholera, as well as innovative ways to curb the problem. Lastly, chapter six provides the summary of findings, conclusions and recommendations.
CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews related empirical studies relevant to this present study. In doing so, the concept of sanitation as it applies to varying contexts is examined. Children’s faecal matter disposal practices is also discussed. Finally, the overview of studies on cholera in Ghana, its prevalence in the Cape Coast Metropolis and individual household and community vulnerability to spread of cholera has been discussed.

2.2 Concept of Sanitation

Scholarly definitions of sanitation have been motivated by both global issues and local situations as well as dynamics. Sanitation, according to Susana (2008), denotes public health situations allied to quality drinking water and tolerable handling and discarding of human faecal matter and waste water. Since this definition may not be reflective of the global scenario, the World Health Organization [WHO] (2015) views sanitation as the delivery of sanitation amenities to enhance proper disposal of human excreta. Thus, maintaining hygienic conditions has been linked to sanitation through proper waste management systems. The definitions of sanitation as given by Susana and WHO appear to be universally accepted, but the term has been conceptualized differently in various socio-cultural contexts. For instance, in some countries promoting hygiene is classified as part of sanitation. For this reason, a somewhat universally accepted definition has also been advanced by the Water Supply and Sanitation Collaborative Council [WSSCC] (2009). To the WSSCC (2009), sanitation denotes “the collection, transportation, treatment and disposal or reuse of human excreta, domestic waste water and solid waste, and associated hygiene practice”. This definition looks more plausible as it includes not only present sanitation as the collection and treatment of waste water in more hygienic manner but also involves the recycling of human waste. Adding to this definition, the
Ministry of Local Government and Rural Development as reported by the Centre for Democratic Development (CDD-Ghana) Report (2002, p. 4), conceptualizes sanitation as “the state of cleanliness of a place, a community, or a people and in particular relates to the quality of life aspect of human health as determined by the physical, biological, social, and psychological factors of the environment.” The report further postulates that sustaining good sanitation involves processes of “assessing, controlling and preventing the environmental factors that can potentially and adversely affect the health of this generation and future generations” (CDD-Ghana 2002, p.4). This study subscribes to the view on sanitation as given by the Ministry of Local Government and reported in the CDD Report (2002). That definition departs a little from the others in that it includes in the definition of sanitation the prevention of those factors in the environment that can potentially and adversely affect the health of this generation and future generations. This study however adds that a definition of sanitation should include the role that the public needs to play in ensuring good sanitation. This is the more reason why this study highlights children’s faecal matter disposal practices by households in Cape Coast Metropolis and how such practices can cause negative health consequences.

2.3 Global Perspective on Sanitation

The gathering of humans anywhere brings about waste accumulation (Acheampong, 2015). This implies that generation of waste is part of human life. However, the issue is how safe these wastes are disposed of safely to ensure a hygienic environment (Acheampong, 2015; Schertenleib et al., 2002). Meanwhile, in the year 2014, it was estimated that about 2.6 billion people lack suitable sanitation globally (UNICEF & WHO, 2014). This worrying phenomenon led to the United Nations Millennium Development Goals (MDG) with the aim of reducing by half the world’s population who do not have access to portable drinking water and basic sanitation by the end of the year 2015.
Although, some parts of the world made a headway, others especially those in the developing world lagged behind due to a combination of factors including population growth and urbanization, institutional challenges, infrastructure challenges, among others (Hutton & Bartram, 2008). As a result, the lack of portable drinking water and basic sanitation still persisted. In Sub-Saharan Africa for instance, only 36% of the population had access to basic sanitation (UNICEF et al., 2004). In the developed parts of the world, about 99% of the population used improved sanitation facilities as compared to about 52% of their counterparts in the developing world (UNICEF, 2015).

As at the year 2015, 61% of the world’s population had no managed sanitation services (SDGs Report, 2018). This is an indication that a good number of people in the world today still lack proper sanitation facilities. It is therefore gratifying to know that the issue of sanitation is captured in the United Nations Sustainable Goals (SDGs) 2015 (Goal 6) considering the fact that global sanitation needs continue to be enormous.

### 2.4 Sanitation in Ghana

Sanitation in Ghana is still a challenge though plans have been laid down to improve it. More than 50% of the population in Ghana uses joint amenities and this can be considered as unhygienic to users (Appiah-Effah, 2009). A vast difference exists as far as access to sanitation among the ten regions in Ghana is concerned. For instance, it was reported that, while 25% of the population in the south of Ghana has better sanitation, less than 5% of the population in the north has access to better sanitation (UNDP, 2010). This has created sanitation disparities in the country, especially between rural and urban areas.

Ghana was considered the world’s highest country in the area of shared sanitation facilities, recording about 58% of such shared facilities, especially in the urban centers. While shared sanitation facilities cover 73% of population in urban areas, only 43% of the population in the rural areas use joint sanitation facilities (WHO& UNICEF, 2017). The increase in
population in urban areas has led to mounting pressure on the few sanitation facilities. In the rural areas, where shared sanitation is less, there is an increasing rate of open defecation. Most rural settings do not have toilet facilities and households have to defecate in bush or adopt other means. WHO indicated that, open defecation accounted for 33% of the population in rural settings which has adverse effect on the community, population and the country as a whole (WHO, 2012). It can therefore be inferred that sanitation in Ghana has been focused on open defecation, but little concern has been given to children’s faecal matter disposal which is very vital and into which this study tries to delve.

2.5 National Environmental Sanitation Policy

To better appreciate the issues raised about the problem of sanitation and further anchor the study, it is important to delve into the National Environmental Sanitation Policy, 1999.

In 1999, a diversity of stakeholders came up with the Ghana National Environmental Sanitation policy (ESP) which covers a wide spectrum of environmental sanitation (Republic of Ghana, 1999). The concise policy document sets out basic principles, objectives and identifies roles and responsibilities. It also covers environmental management and protection, legislation and funding among others. In January 2000, the National Environmental Sanitation Policy Coordinating Council (NESPoCC) was established to advance the implementation of the National Environmental Sanitation Policy. There are enough laws and bye laws to support Environmental Service delivery and its enforcement. The Ministry of Local Government and Rural Development (MLGRD) published the National Environmental Sanitation Policy in May 1999. The policy looks at the basic principles of environmental sanitation, problems and constraints. It also looks at the roles and responsibilities assigned to the various stakeholders. Out of the Policy, the MLGRD has also developed a technical guideline document titled “The Expanded Sanitary Inspection and Compliance Enforcement (ESICOME) Programme guidelines”. These guidelines look at four broad areas namely; “effective environmental health
inspections (Sanitary Inspections), dissemination of sanitary information (Hygiene Education), pests/vector control and law enforcement”. Generally, the NESPoCC is in charge of coordinating the policy and ensuring effective communication and cooperation between the various agencies involved in environmental management in their respective Districts.

The Environmental Sanitation Policy, (MLGRD, 1999) is geared towards ensuring sustained environment and facilitating the growth of physical, social and economic well-being of people. (MLGRD, 1999). The policy identifies many of the major problems and constraints in environmental sanitation and lays out appropriate strategy in addressing these problems. The strategy include: “Defining the roles and responsibilities related to environmental sanitation of institutions from the national ministries down to unit committees, community organizations, and the individual; the privatization of environmental sanitation services; the creation of a National Environmental Sanitation Policy Coordinating Council (NESPoCC) and a District Environmental Sanitation Fund (DESF); and the phasing out of pan latrines (by 2010). Targets were set for 2020 (except for the phase-out of pan latrines, which was targeted for 2010)”. (MLGRD, 1999)

The roles and responsibilities stated in the policy have made it easy for government in policy making. Tayler and Salifu in 2005 found out gaps in the activities and coordination of some institutions and ministries in their study on Evaluations of Ghanaian sanitation policy and governance. They suggested that, an update be done to inculcate the duties of the MWRWH and Community Water and Sanitation Agency (CWSA), as well as other institutions such as Ministry of Health. The roles and responsibility of individuals and community has also been spelt out in the policy. In the policy, powers have been entrusted to the Assemblies to assist in managing environmental and sanitation problems. (MLGRD, 1999, p19).

This clearly indicates that, these laws and policies have not achieved their intended purpose and coupled with unavailable logistics, the MMDAs have been crippled in ensuring
hygienic, safe and healthy surroundings especially with the disposal of children’s faecal matter. Therefore, there is a clear opportunity for Cape Coast Metropolis to endorse firm bye-laws for environment and sanitation which consider children’s faecal matter disposal to make the city inhabitants responsible for environmental sanitation in Cape Coast to ensure good environmental sanitation practices.

2.6 Socio-Economic Impacts of Sanitation

For any social and economic development to take place, a community needs to ensure that adequate sanitation, good hygiene including quality water are provided. There is no gainsaying that the lack of proper sanitation leads to the outbreak of diseases which are mostly connected to poverty. Indications show that 4.0% of deaths and 5.7% of diseases globally are as a result of improper sanitation (Prüss et al., 2002). Among developing counties, improper sanitation has affected majority of the population. The importance of the isolation of excreta and waste lies in an effort to prevent diseases which can be transmitted through human waste, and afflict both developed and developing countries at varying degrees.

This situation presents substantial public health risks as the waste could contaminate drinking water and cause life-threatening forms of diarrhoea to infants. According to the WHO&UNICEF Report (2017), the lives of most children who die from diarrheal diseases annually could be spared when there is proper sanitary as well as handwashing. Estimates show that up to 5 million lives are lost annually from avoidable waterborne diseases, due to lack of adequate sanitation and hygiene practices. The effects of sanitation have impacted the society of people throughout history (Gleick, 2002; George, 2008).

Sanitation is a necessity for a healthy life. Lack of sanitation also holds back economic growth. Poor sanitation costs billions to some countries, amounting to the equivalent of 6.3% of GDP in Bangladesh, 6.4% of GDP in India, 7.2% of GDP in Cambodia, 2.4% of GDP in Niger, and 3.9% of GDP in Pakistan annually (WHO&UNICEF, 2010). The economic losses
are mainly driven by premature deaths, the cost of health care treatment, loss time and productivity seeking treatment, and lost time and productivity finding access to sanitation facilities. Pollution resulting from improper disposal and treatment of waste water and domestic faecal sludge also affects both water resources and ecosystems. At the same time, faecal sludge and waste water can provide valuable resources (water, nutrients, and energy) and economic opportunities, especially in urban areas and in water-scarce environments (Kosek, et al 2003; World Bank, 2017).

It was noted that, diseases associated with poor sanitation are particularly correlated with poverty and infancy and these alone account for about 10% of the global disease burden (Prüss et al., 2002). As seminal as this finding is, I believe that illiteracy also accounts for the outbreak of diseases worldwide. A finding from the WHO Report (2000) suggests that at any given time, close to half of the urban populations of Africa, Asia, and Latin America have a disease associated with poor sanitation, hygiene, and water. When it comes to sanitation, faeces are the most dangerous to health cannot be under-estimated. It is estimated that a gram of fresh faeces from an infected person can contain around 106 viral pathogens, 106–108 bacterial pathogens, 104 protozoan cysts or oocysts, and 10–104 helminth eggs. Diarrhoea diseases are the most pervasive of the faeco-oral diseases globally, causing around 1.6–2.5 million deaths annually, many of them among children under 5 years old living in developing countries (Kosek et al., 2003; Mathers et al 2006). In 2008, for example, diarrhoea was the leading cause of death among children under 5 years in sub-Saharan Africa, resulting in 19% of all deaths in this age group (Black et al., 2010). Since the wrong disposal of human excreta is dangerous to human health, it is therefore necessary to focus on children’s faecal matter disposal as it is capable of contaminating the environment if not treated well by households.

Systematic reviews suggests that improved sanitation can reduce rates of diarrhea diseases by 32%–37% (Fewtrell et al., 2005; Waddington & Snilstveit, 2009). While many of
the studies included in those reviews could not rigorously disaggregate the specific effects of sanitation from the overall effects of wider water, sanitation, and hygiene interventions, a longitudinal cohort study in Salvador, Brazil, found that an increase in sewerage coverage from 26% to 80% of the target population resulted in a 22% reduction of diarrhea prevalence in children under 3 years of age; in those areas where the baseline diarrhea prevalence had been highest and safe sanitation coverage lowest, the prevalence rate fell by 43% (Barreto et al., 2007). Similarly, a recent meta-analysis that explored the impact of the provision of sewerage on diarrhea prevalence reported a pooled estimate of a 30% reduction in diarrhea prevalence and up to 60% reduction in areas with especially poor baseline sanitation conditions (Norman et al., 2010).

Another longitudinal study in urban Brazil found that the major risk factors for diarrhoea in the first three years of life were low socioeconomic status, poor sanitation conditions, presence of intestinal parasites, and absence of prenatal examination. The study concluded that diarrhoeal disease rates could be substantially decreased by interventions designed to improve the sanitary and general living conditions of households (Genser, et al., 2006). Further, it is not just the provision and adult use of sanitation that is important. A meta-analysis of observational studies of infants' faeces disposal practices found that unsafe disposal increased the risk of diarrhoea by 23%, highlighting the importance of the safe management of both adults' and infants' faeces (Lanata et al., 2008).

Assertions from these studies indicate that sanitation is integral in curbing certain deadly diseases such as diarrhea which affects children especially in most developing countries. Therefore, addressing issues pertaining to such diseases such as poor disposal of children’s faecal matter can in a way help reduce its socioeconomic impacts, hence contributing to development.
2.7 Sanitation and Disposal of Child Faeces

According to a WHO/UNICEF report (2012), there are 2.6 billion people who still lack the opportunity to good sanitation worldwide. However, even in households that have access to latrines, children’s faeces are often neither collected nor disposed of safely in latrines. This problem creates an issue even in houses with sanitation facilities, as ensuring an environment free of faecal pathogens is required to prevent the transmission of faecal-oral diseases such as diarrhoea. As Gil et al. (2004) revealed, the faeces of children are particularly important in faecal-oral transmission as children are more susceptible to these diseases and are often defecating in areas where other children could be exposed (such as the ground in the compound or house).

Interestingly, there is a belief that the faecal matter of infants as well as young children are not harmful; however this is certainly not true (Gil et al., 2004). In fact, there is evidence that children’s faeces could be riskier than adults’, due to a higher prevalence of diarrhoea and pathogens such as hepatitis A, rotavirus, and E. coli in children as compared to adults (Feachem et al., 2003). Gil et al. (2004) further opined that precarious disposal of children’s faecal matter may be a key pollutant in household environment hence posing a high risk of exposure to young infants.

The unsafe disposal of child faeces may represent a more significant health risk than that of adults. This is because young children have the highest incidence of enteric infections (Fischer-Walker et al., 2012), and their faeces are most likely to contain infectious agents (Feachem et al., 2003). Lanata et al. (2008) add that young children are more likely to defecate in places where susceptible children could be exposed. This exposure is worse for other young children due to the amount of time they spend on the ground and their exploratory behaviours including putting fingers and fomites in their mouths, and common behaviours such as geophagia (intentional consumption of earth) (Moya et al., 2004; Ngure et al., 2013). An
additional risk of contamination of the environment with faeces, including those of children, is that it may result in extended exposure of children to faecal pathogens which may lead to enteropathy, a disorder of the small intestine that is characterised by villous atrophy, crypt hyperplasia, inflammatory cell infiltrate, increased permeability and malabsorption (Humphrey, 2009).

In the light of this, the safe and proper disposal of children faecal matter is as important as that of adults. Children’s faeces should be treated with the same concern as adult faeces, using safe disposal methods that ensure separation from human contact and household contamination. The safest way to dispose of a child’s faeces is to help the child use a toilet or latrine or, for very young children, to put or rinse their faeces into a toilet or latrine. However, in Ghana, improved sanitation poses a huge challenge, as 40% of the population still practices open defecation and only 55% of the population uses improved sanitation. The Ministry of Health (2015) reports that the unsafe disposal of child faeces is a common practice in Ghana, and therefore constitutes a significant source of exposure to faecal pathogens. Hence, this has led to large-scale interventions to increase sanitation coverage.

Though the effect of poor sanitation and hygiene is regularly measured by the impact on children, most sanitation and hygiene interventions are steered towards adults. However, it is believed that the effective disposal of child faeces is an essential indicator for an open defecation-free certification. In fact, as Fischer-Walker et al. (2012) remind us, the insanitary disposal of child faeces may have substantial impacts on the health of children, including a higher prevalence of diarrheal diseases.

The above implies that, in order to achieve the Sustainable Development Goals of Universal Coverage or end open defecation by 2030 (SDG 6, Target 2), safe and proper disposal of children faecal matter ought to be ensured. Studies have proven how children’s faeces are disposed, despite the neglect given to children sanitation in the area of research,
policy, and program intervention. Also, much evidence on the effective strategies for increasing the safe disposal of children’s faecal matter have not been accessed. Therefore, the most needful knowledge gaps ought to be filled to enable the availability of a comprehensive, practical, evidence-based policy and program guide.

2.8 Children’s Faeces Management

In Gil et al.’s (2004) systematic review on Cholera, a range of children’s defecation sites used worldwide some of which include the use of diapers, the latrine as well as the river were identified. The use of these sites was dependent on the age of the children therefore diapers were mostly used for infants, potties for toddlers while older children used the yard and rarely the latrine. A wide range of final disposal habits of children’s faecal matter were also recognized and these included recycling a diaper, burying faeces, transporting faeces away from home and depositing faeces in a river or a latrine. In all the diverse studies conducted, most children were cleaned by a caretaker after they defecated and how these caretakers washed their hands depended on the age of the child. Also, low usage of soap by caretakers in washing hands was predominant.

A meta-analysis steered by Gil et al. (2004) established that comparing non-hygienic behaviours such as open defecation and removal of stools from the soil to hygienic behaviours such as latrine, potty and diaper usage, the former increases the risk of diarrheal diseases by 23% (OR 1.23 CI 1.15-1.32). Although results derived from studies varied, it indicated that hygienic practices provide reasonable protection against diarrheal diseases due to high risk through the use of latrines by children. In addition, studies acknowledged by the Child Health Epidemiology Reference Group (CHERG) located at the London School of Hygiene and Tropical Medicine (LSHTM) indicated a safer means of disposing faecal matter (OR 3.36 and RR 1.45, CI 0.99-2.12). They concluded that this data was the most suggestive means for safe stool disposal. Some barriers to these hygiene practices are: (i) time and energy needed for
stool disposal (ii) wrong awareness on the harmlessness of children’s faeces (iii) scarce resources and (iv) perceptions of dangers around the use of latrine for young children (Gil et al., 2004).

It is important to note that the products and materials needed in the management process of child faeces differ within countries and communities as well as in effects for hygienic management of faeces based on design features. Various studies have also been conducted to identify the roles played by latrine and products in facilitating hygienic child faeces management practices. For instance, research in Mozambique showed that there is a positive relationship between access to sanitation facilities and safe stool disposal though children under five are unlikely to use sanitation facilities in houses that own them thereby practicing open defecation (Gil et al., 2004; Sykes, 2008). Therefore, a study in Peru which investigated the role of potties in hygienic faeces management within an urban area stated that children under five are unable to use the latrines so diapers and potties should be promoted as part of children’s sanitation project. This induced a change since most mothers were now eager to use potties for children and not diapers so to prevent the washing of diapers although potty training was seen as a challenge (Yeager et al., 2009). Regarding factors which are likely to determine the hygienic disposal of faeces, the study identified the age of children, effort required, perception of neatness and available resources as known determinants.

A study has been conducted by the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR, B) to serve as guide for development in the management of child faeces. As part of the above research, products that could help in effectively disposing child faeces such as potties and “sani-scoops” were provided to some households in Bangladesh. The study realized that there was a high usage of the potties (about 67%) and “sani-scoops” (about 89%) among households with children under three years. However, an increase (from 15% to 84%) in children defecating in a potty statistically did not change the
significant difference in the presence of human faeces in or around households before and after this intervention. As stated by Sultana et al. (2013), some barriers to the use of the products include the difficulty involved in potty training plus the perceptions of the harmlessness of animal and children’s faeces.

Even with the confirmation that children’s faeces play a major role in transmitting the diarrheal disease especially through contamination of the household’s surroundings, research and intervention focused in this area is relatively little. For example, according to the 2010 Demographic Health Survey in Cambodia, about only 20% of child faeces were disposed of in an improved sanitation facility. Similarly, in Cambodia, Miller-Petrie et al., (2015) explored recent practices as well as roles that products may play in increasing hygienic management practices. The primary point of defecation, method of transporting faeces, and exact place of disposal varied based on child age, especially with kids under the age of two who are less likely to have their faeces disposed hygienically. In total. 62.7% of households were reported using a major hygienic site for disposal whereas 35.7% were consistent in doing so. The various factors related with hygienic disposal included the number of years a household owned a latrine, the age of the caregiver, the presence of tools for managing child faeces in the latrine, and the consistent use of latrine by adults. Results derived demonstrated the need for an intervention targeting the hygienic disposal of faeces of children below five years in Cambodia and specifically for children below the ages of two. Technologies best to facilitate hygienic disposal for these ages include reusable diapers, potties and potentially latrine seats. Also, marketing these products will be needed to address hygiene behaviours associated with child cleaning and caretaker hand washing to guarantee a reduction in disease transmission.

In the 2010 demographic health survey in India, it was found that just 20% of child faeces ended in latrines—either the child defecated in the latrine, or it was placed there by a caregiver—the last time the child defecated (International Institute for Population Sciences
(IIPS) and Macro International, 2007). Less than 1% was buried, a method currently characterised by the WHO/UNICEF Joint Monitoring Programme on Water Supply and Sanitation (JMP) as safe disposal (WHO/UNICEF, 2010). However, a recent expert review deemed burial to be unsafe because of the thought among others that burial sites could be near the home and children’s play areas and that the practice would not be acceptable for adults (Bain, & Luyendijk, 2015). In children under 3 years, 16% of faeces were disposed of in any sanitation facility, about half of which (9%) were improved facilities (WHO/UNICEF, 2014; UNICEF/World Bank, 2015). In a cross-sectional study in rural Odisha, India, among households with latrines in villages where the TSC had been implemented at least 3 years before, it was found that less than a quarter of the children’s faeces ended up in a latrine (Majorin, Freeman & Barnard, 2014). Though the findings of this study were revealing, it was only limited to only rural communities in India. Considering the population of India, such study is not representative of even a fraction of the population. This therefore calls for a study that investigates the situation in an urban location especially Cape Coast metropolis.

2.9 Overview of Cholera in Ghana

It is a devastating experience when Cholera strikes. This is because it spreads speedily thereby infecting people unknowingly who later passes it on to others. Communities with high densities around city centers are mostly severely affected by such outbreaks where their efforts to contain the disease becomes a race. Approximately, between 1.4 and 4.3 million cases of Cholera are recorded annually worldwide. Although it has disappeared from Europe for more than a century, the “dirty-hands disease” keeps on killing, far from sight, 148,000 people every year. In Africa, cholera is seen to be epidemic in most countries (WHO, 2005, WHO, 2013). Over 100,000 incidents of cholera cases yearly were reported to WHO from over 20 African countries of which Ghana happens to be part with case fatality rates reaching about 3% (Mintz & Tauxe, 2013).
Ghana has more than half of its urban population living in informal settlements where there is unreliable access to safe water as well as limited basic sanitation services. Hence it is easy for diseases like Cholera to spread rapidly in such communities. However with access to clean water, proper hygiene practices as well as improved sanitation, Cholera can be prevented or stopped to an extent. Intermittent Cholera outbreaks in Ghana have been reported since the early 1970s, with significant epidemics in the recent past. The outbreak of cholera yearly from 1990 to 2010 reduced overtime and begun to increase from 2011 to 2012 again (UNICEF, 2014).

The main outbreaks of Cholera were reported in the densely populated regions of Greater Accra and Ashanti as well as bordering coastal regions. Studies show that Ghana is affected by cross-border Cholera outbreaks mainly from Nigeria and Togo, especially along Guinea coast (UNICEF, 2014). The Ashanti Region alone in January 2013 recorded 310 cases of cholera with 18 deaths of which the majority of the infected persons were women and children. In 2014, sixty (60) percent of Ghana’s districts reported Cholera as infectious and in 2014 and 2015 combined, nearly 30,000 new cases and over 250 deaths were reported. Seven out of ten regions (Greater Accra, Central, Eastern, Upper West, the Northern regions, Ashanti) were affected by cholera outbreak in 2014. The Greater Accra Region has been the hardest hit. (Ghana Health Service, 2014). These reported cases served as evidence that gave a need for an urgent action against the increase of cholera outbreak. Hence, measures were laid down to mitigate the outbreak of cholera which led to a reduction to 687 with 10 deaths in 2015. In the year 2016, getting to the latter part of October, more than 720 cholera cases with no death incident occurred of which Cape Coast Metropolis received the highest outbreak (GHS/MHS, 2016; (Global Communities, 2017).

Global Communities together with the Ministry of Local Government and Rural Development, and other international and national institutions and agencies too responded to
the mass outbreak of Cholera in 2014. Through their efforts, they addressed the situation by: first, undertaking a seven year project that looked at access to improved water and sanitation facilities in urban communities. (Water and Sanitation for Urban Poor-WASH-UP). Also, a five-year project focusing on water, sanitation and hand washing (WASH) activities for rural populations was developed. (GHS/MHS, 2016; Global Communities, 2017). As mentioned earlier, the major aim of this program was to reduce the outbreak of certain diseases such as cholera.

Also, Global Communities offered both financial and logistical support to GHS to enhance their operations. On educational support, Global Communities also engaged hundreds of volunteers to educate urban populations on key hygiene behaviors. In addition to this, they trained food vendors on proper techniques for food preparations in order to minimize the spread of diseases. The training of food vendors was a response to the outcome and earlier study in the WASH-UP project which found out that half of all residents in deprived urban communities rely on food that is cooked outside the home. (GHS/MHS, 2016; (Global Communities, 2017). The assertions from the above indicate that interventions to reduce the outbreak and spread of cholera such as education on proper sanitation have been addressed. Hence, the area of managing children’s faecal matter has been limited and no clear cut interventions have been employed to assess it in relation to cholera in Ghana and especially Cape Coast Metropolis which this study sought to address.

2.10 Prevalence of Cholera in Cape Coast Metropolis

The Central Regional capital, Cape Coast, is a fishing port and has a rich historical background. The city was founded by the people of Oguaa and it is situated on the southern part of Ghana. According to the 2010 Population Census, Cape Coast had a population of 169,894 people. Cape Coast has a mean monthly relative humidity ranges between 85% and
99%. It has an undulating landscape. Tourist sites include the Cape Coast castle, Kakum National Park, Hans Cottage (GSS, 2010).

Despite the above exciting description, the city has suffered a major setback on health related development. Problems such as bad sanitation and, cholera outbreaks are plethoric in recent times. This feature will focus on the cholera outbreak which has come to public eye lately with inhabitants of Cape Coast seeking perpetual solution. Cholera still remains a big risk to health and is a key indicator of poor environmental and personal hygiene, inadequate sanitation and lack of social improvement in the affected areas.

The outbreak of cholera in Akotokyire, Pedu, Abura and other suburbs of Cape Coast were directly proportional to the continuous growth of vulnerable populations living in areas with poor or unsanitary conditions. During the national cholera crises in 2014, Cape Coast recorded 2,874 cases with 60 people losing their lives. With this, there was a remote possibility that we would be rescued in subsequent years by putting tentative measures on board. In the year 2015, Cholera was somehow brought under control as there was no death out of the eight (8) reported cases (Ministry of Health, 2014).

In the year 2016, about 500 persons were affected by cholera since its outbreak in the Central Region. 157 cholera cases were reported in Cape Coast with Abura being the hotspot. Despite the immense number of people contracted with the infection, no death has been recorded since the outbreak on October 21, 2016 (Ministry of Health, 2014. The Cape Coast Metropolis in the Central Region recorded 12 cholera cases in January 2017. This then presents that Cape Coast metropolis has not recorded zero outbreak of cholera cases in the last four years even though there have been reduction in the number of outbreaks recorded. What it then means is that an aspect of sanitation has been neglected by households and stakeholders, and hence, this study’s attempt to delve in that aspect which is the role of children’s faecal matter in cholera outbreak by households in Cape Coast Metropolis.
2.11 Individual household and Community Vulnerability to the spread of Cholera

According to the WHO & UNICEF’s (2017) Report, Cholera, has been closely associated with the absence of safe water, poor sanitation and waste management. There is high prevalence of cholera in many places in the developing world, and even more acutely in overcrowded settings, where it is either endemic or a recurrent problem. Areas at risk to cholera are characterized by peri-urban slums, with inadequate basic infrastructures. Internally displaced or refugee camps, where minimum requirements of clean water and sanitation are not met are also at high risk of cholera outbreak. Inhabitants of rural areas, particularly along rivers and lake shores, are also at risk due to unhealthy living conditions.

“Vibrio cholerae is a natural inhabitant of the aquatic environment, which with evidence of new biotypes emerging from its environmental reservoir, indicates that cholera bacteria cannot be eradicated” (Colwell, 2006). Because cholera outbreaks will continue to occur over time, the most effective means of controlling the disease is to minimize exposure to pathogenic strains and reduction in the concentrations of Vibro cholerae bacteria. Cholera has high prevalence in South Asia, sub-Saharan Africa, and Latin America. Within these regions, it has been observed that a majority of the outbreaks emanate from coastal regions. This outcome shows a strong relationship between environment and the disease (Huq & Colwell, 2006). Even though there has been advancement in research and knowledge in cholera, the unpredictable nature of the Vibro cholerae bacteria and its next occurrence, timing and adverse impact should there be any occurrence, are all essential considerations in devising and implementing an effective intervention strategy.

“The results of environmental sampling and analysis of the environmental and clinical data have revealed significant correlations of water temperature, water depth, rainfall, conductivity, and copepod counts with the occurrence of cholera toxin-producing bacteria (presumably V. cholerae)”. The gaps in factors, such as water temperature and salinity, and
occurrence of cholera shows correlation with biological parameters, e.g., plankton population blooms (Huq, Sack, Nizam, Longini & Nair, 2005).

Contaminated water and food (especially seafood) is a more common cause of cholera in developing and developed countries respectively. Eighty eight percent (88%) of all diarrheal disease in the world can be attributed to poor sanitation and hygienic conditions. Poor sanitation was singled out as the main cause of cholera in community assessment done to determine risk factors and gaps in cholera control. (Ghana Health Service, 2014). Heavy rainfall, flood and breakdown of sanitary infrastructure, accelerates interaction between contaminated water and human activities, resulting in high incidence of cholera within a geographical area. Cholera outbreak is not a respecter of age, sex and socio-economic status. However, the above mentioned factors bring differences in susceptibility. Health status, occupation and other socio-demographic factors may therefore place certain social groups at higher risk of contracting and spreading the disease in a given setting.

A study by Dixit (2010) in Western Kenya revealed that 79.2% and 76% of respondents resort to lake water and rainwater during dry and rainy seasons respectively. More than 77% of the respondents reported washing containers for carrying water while 81.2% of them reported cleaning containers for water storage. Ironically household inspection found almost 75% of these containers dirty. The majority of them had poor hand washing practices with low latrine coverage of 27.1%. The most common method of disposing children faeces was burying. Even though the majority of the respondents had knowledge of causes, symptoms and mode of transmission of cholera, its prevention and treatment is still a challenge.

It can be deduced from the above that, cholera is mostly found in over-populated areas and communities closed to water bodies. Poor sanitation and water safety as well as inadequate information on hygiene as well as prevention and control of cholera makes these communities very susceptible. Other factors such as low latrine coverage due to poverty and collapsing
soils, lack of a safe water source and inadequate chemicals for treatment of water increased the community’s vulnerability to cholera. Households in Cape Coast metropolis are also vulnerable to cholera due to their geographical location, which is closeness to water bodies and sanitation coverage which include the disposal of children’s faecal matter.

2.12 Theoretical Perspectives Underpinning the Study

“Geography has made an important contribution to understanding how the spatial and temporal proximity of human populations to infectious agents in the physical environment contribute to risk of infectious diseases” (McLafferty and Moon, 2010, pp.27-28). Some epidemiological approach and theoretical perspectives to the studying of infectious diseases include; the gem theory of diseases, the supernatural theory of disease causation and the diseases ecology approach.

2.12.1 The Gem Theory of Diseases Causation

The gem theory of diseases causation is attributed to Lous Pasteur (1822-1895). This theory suggests that the invasion of micro-organism results in diseases causation, that is, illness is caused by bacteria, virus and other micro-organisms. The theory further holds that a specific germ is responsible for each disease. One of the strengths of the theory lies in the fact that, it presents another dimension to the understanding of disease causation. Up to the time that the theory was propounded, causation of illness and disease had rested on ancient Shamanism, superstition and religion, of invading entities and spirits (Baker, 2005). Also, the emergence of the germ theory initiated a forward drive in medicine that resulted in massive advancements and developments in antiseptics, antibiotics, and the better understanding and appreciation of microbiology and pathology—laying the foundation of modern science. However, the germ theory at the earlier stages of its evolution and even in contemporary times runs into criticisms.

The assertion is that it shifts personal responsibility for health and well-being onto the sole sphere of the medical profession who possessed the knowledge to get rid of those germs (Baker, 2005). Thus, given this line of thought, the “germ era” contributed in no small measure
to the decline of public hygienic health in the 19th century in especially the west, were it started and had multitudes of ardent and inordinate disciples. It is also argued that, the Germ theory failed to answer some few important observations: For instance, why is it that not everyone who is exposed to a bacteria or virus falls ill? For example, medical doctors in general practice typically come into close contact with scores of flu sufferers every day. Yet, they do not generally get the flu. Also, how is it possible to avoid illness without avoiding contact with bacteria and viruses? Unless we live in isolation in a sterile environment, it is impossible to avoid contact with bacteria and viruses. Yet again, by changing our diet, getting enough physical activity and rest, taking nutritional or herbal supplements, etc, we can avoid falling ill so often (Seah, 2013). It is found that the germ theory of disease, while it seems to make sense and has a lot to offer, does not totally prove that germs "cause" diseases. Could it well be the other way around? - That once a person is sick (due to whatever other reasons), that person's body allows germs to thrive? Furthermore, evidence is mounting that the fight of disease with antibiotics, vaccinations and pasteurization on the basis of the germ theory comes with serious side effects. The review of the germ theory in this context, it was hoped, would help broaden the scope of the study to cover various attributions made to the causation of the prevalence of disease in a given locality.

2.12.2 The Supernatural Theory of Diseases Causation

This theory proposes that, the manifestation of diseases and illness is attributed to supernatural and unseen forces. Its observation emanates from the casual dispositions of diseases among and across cultures. At the peak of this theory is superstition. Superstition according to Dawkins (as cited in Beck & Fortsmeier, 2007) is defined as a wrong idea about external reality. Even though, it is as old as humanity, this theory seems not to have lost its relevance in contemporary times. It may be erroneous for the assumption to be made that this theory finds inordinate followers only in remote rural settings and among illiterate folks (simple societies). The supernatural theory of disease causation does not show empirically the grounds
on which cause and effect meet and unite. One other criticism is that, some people find in the
supernatural theory of disease causality a handy way to castigate their enemies. Yet, because
health concerns like epidemics took a greater toll on the poor than the rich in most societies,
the rich could employ the supernatural theory as a justification for scolding the poor for their
sinful behaviour (Tesh, 1988). The relevance of this theoretical review would help place into
perspective people’s perceptions about managing child faeces and cholera in the study area. As
noted, perceptions about diseases are varied.

2.12.3 The Triangle of Human Ecology

The triangle of human ecology originated from the works of Meade and Emch. The
model focuses on the interaction of human behaviour with the cultural, socio-economic and
environmental conditions in order to generate and prevent diseases in vulnerable people. From
the model, population, habitat and behaviour encompasses the state of human health
Figure 2.1: The Triangle of Human Ecology

Source: Meade and Emch, (2010)

Figure 2.1 discusses the three determinants as explained by Meade and Emch, (2010). Population is regarded as human organism susceptible to the host of diseases. For instance, population is being characterized by age, gender and genetic susceptibility which shows whether or not a host can cope with infection (physically or emotionally). It goes ahead to suppose that, the interaction between the host and the diseases could relatively determine the sort of health outcome and pattern that would be generated in a specific area at a given period of time.

Habitat is made of the part of the earth occupied by people which may affect them directly or indirectly as they carry out their daily activities. It includes natural, social and built habitat. Natural habitat is made up of topography, land cover, land use, climate and weather
patterns. Social habitat on the other hand includes family, friends, culture, and spiritual influence. Lastly, built habitat are the buildings and settlement types we live in, work out and travel within during daily routines (construction materials, sanitation and waste disposal, water sources, building designs, air flows and lighting, health care facilities and transportation).

Behaviour refers to the observable aspects of culture. It stems from cultural precepts, economic constraints, social norms and individual orientation, outlook and psychology. Mobility, roles, cultural practices and technological interventions are covered here. According to Glanz et al. (2002), health behaviour is influenced and determined to a significant extent by individual or personal belief or perceptions. Thus, a wide range of intrapersonal factors such as age, sex, ethnicity, personality, socioeconomic knowledge and self-efficacy could affect health behaviour.

The relevance of the human ecology approach as stated by Apwah (2013) is that, it tries to depict critical concept of holism which is central in geographical studies. Also, it comes in strongly as a potent means of explaining the distribution of disease concentration among population. Lastly, it places a spot light on the material aspects of culture in the intricacies of health concerns.

Despite its relevance, the approach has been criticized as being overly determined - attempting to capture everything under the sun, as it seeks descriptions to concerned phenomena. Thus, in such an over-elaborate attempt, details may be forfeited for superficial and general patterns and trends (Apwah, 2013; Ostfeld et al., 2005).

2.13 Conceptual Framework of the Research

For the purpose of this study, a model by Coffie (2015) was adapted for the research. This model as indicated in figure 2.2 considers some aspects of the human ecology model as well as some intervening factors responsible for the spread of diseases like cholera. The
framework propounded by Coffie looked at the effect of environmental and demographic factors in disease transmission such as cholera. Variables to be explained under the environment/habitat in the community include location of settlements, availability of toilet facilities, children’s faecal disposal site and faecal contamination. Also, intervening elements between environmental factors and cholera as demographic factors (Age, sex, educational level, religion etc), economic status (income), knowledge and perception, coping strategies will be inquired in the study.

Inadequate and lack of toilet facilities in households has led to the improper disposal of children’s faeces, and hence new prospective spread of cholera. The spread of cholera is dependent on the dumping of human excreta into the environment (land and water bodies). Through this mechanism, the virus passes from the faeces to continue the life cycle in the environment given the availability of the right host (Tesh, 1988). This would intensify the risk of getting infected. Also, intervening factors such as income and educational attainment inform households on where to dispose children’s faeces. The safe and unsafe disposal of children’s faeces may be dependent on inequalities of socioeconomic conditions and social determinants such as age, income, education, gender and behaviour. Individuals become exposed to contaminated children’s faeces and vulnerable to health outcome when the conditions of the environment are not favourable. These factors also consist of rate of contact with the source of infection, disease prevention and control interventions as well as knowledge and perceptions. There can be cholera prevention when stakeholders and actors who are into environment, sanitation and health get involved through law enforcement, health protection or and education.

The model fits into the current study in Cape Coast metropolis by assessing the environmental conditions such as children’s faecal disposal, toilet availability etc, intervening factors between the environment and cholera. Finally, the role of stakeholders, policy makers
and health personnel in controlling the spread of cholera through faecal disposal was touched on.

**Figure 2.2: Influence of environmental and socio-economic factors on the spread of cholera**

*Source: Adapted: Coffie, 2015*
CHAPTER THREE

STUDY AREA AND METHODOLOGY

3.1. Introduction

In this section, the procedure used in carrying out the research has been outlined. It includes the area under study and population, source of data, sampling procedure, data collection tools, data collection methods and analysis.

3.2. Study Area – Cape Coast Metropolis

Under the study area, physical characteristics, population, sanitation facilities such as waste disposal methods, toilets facilities, water, economic activities, religion and education of the study area are discussed.

3.2.1. Physical Characteristics

Cape Coast as shown in figure 3.1 is found within Longitudes 1° 1’ to 1.41’ West of the Greenwich Meridian and Latitudes 5° 20’ North. The Metropolis shares common boundaries with Twifo Heman Lower Denkyira District to the North, to the South is the Gulf of Guinea, West by Komenda Edina Eguafo Abrem Municipality and East by Abura Asebu Kwamankese District. The total land area occupied by the metropolis is about 122 sq.km (MPC, 2014). Generally, the nature of the landscape in Cape Coast Metropolis is undulating, mainly made up of batholiths feature. Birimain formation is the major rock type found in the Metropolis and is made up of pegmatite, schist and granites. Sandy and clayey silts are mostly found along hills whereas clayey gravel with lateritic soil is mostly located in the valleys (MPC, 2014).

The valleys have been covered by water bodies such as rivers and streams which include the Kakum, which serve as the major stream in the Metropolis by providing domestic and industrial purposes. The northern part of the Metropolis is made up of low-lying landscape and is fit for the cultivation of crops. The Metropolis is located in the littoral anomalous zone.
of Ghana. Temperature is relatively high throughout the year with February and March being the hottest while June, July and August portray the coolest months. The Metropolis experiences two major rainfalls in a year with annual rainfall between 750mm and 1,000mm. Cape Coast is a humid area. Mean monthly relative humidity is between 85% and 99% in the morning. But in the afternoons humidity varies considerably from around 50% in the dry months to the high 80s during the wet months, especially in May and June. Presently, the kind of vegetation found there is made up of grasses, shrubs and a small number of scattered trees (MPC, 2014).

3.2.2. Population

Cape Coast Metropolis, according to the 2010 Population and Housing Census (PHC), has a population of 169,894 which constituted 7.7% of the region’s total population. Females constitute the greatest percentage of 51.3% while 48.7% are males. The population is mainly made of youthful aged 20 – 24 years. In terms of age dependency ratio, females’ age dependency ratio (49.9%) was higher than that of males (48.2%) (GSS, 2010).

The Cape Coast Metropolis has 40,386 households with a total household population of 140,405. With this, 3.5 persons per household constitute the average household size. The highest proportion of the household structure is made of children which accounted for 37.1% in the metropolis (GSS, 2010). The Metropolis had an urban population of 76.7% and rural population of 23.3%. (MPC, 2014).

3.2.3. Sanitation and facilities

3.2.3.1. Waste disposal methods

Sanitation is generally at its minimal which sometimes poses health risk to individuals. Private contractors handle most sanitation facilities (Awere et al., 2016). Public container is mostly used by the public for solid waste disposal and this constituted 56.7%. Twenty one (21.9%) of households dispose solid waste in the open. There is house to house waste collection and this accounts for 5.5 percent. In terms of liquid waste disposal, the two main methods adopted by households is by pouring waste into gutters and through drainage system into a gutter (GSS, 2010).
3.2.3.2. Toilets facilities

The Metropolis has 25 dry and 29 wet public toilets and latrines. (Awere et al, 2016). Materials for collecting faeces and urine include septic tanks, unlined pits and concrete holding chambers. They are transported to the final liquid waste disposal site at Nkanfoa when full. Traditional pit latrines are covered with sand when full and another site is excavated. In practice, most grey water is discarded straight into drains, the sea, and outflows to surface water (MPC, 2014). Categories of toilet facilities in the Metropolis include water closet (34%), KVIP (5%), Pits and bucket (11%), public toilet (10%), no facility/bush/beach/field (9%) and others as 29% (GSS, 2010 & MPC, 2014)

3.2.3.3. Source of water

The major source of portable water for drinking in the Metropolis is pipe-borne which covers over 90% of the community especially in the south sub metro. Some areas in the north sub metro still acquire their source of water from rivers or streams not well protected and other unauthorized sources. This is because the supply of water from the Ghana Water Company is not sufficient to cater for the large population especially the large number of educational institutions emerging in the Metropolis. The Metropolis used to experience water shortage but this has been reduced in recent times. Ghana Statistical Service in 2010 grouped source of drinking water in the Metropolis. Percentage-wise, pipe borne water in the South of the metropolis constitutes 86.5%, sachet water 11.4%, Tanker service 0.1% and others 0.1%. On the other hand, pipe borne water in the north of the Metropolis constituted 79.00%, sachet water 18.3%, tanker service 0.1% and others 0.2% (GSS, 2010).

3.2.4. Economic activities and status

Economic activity includes fishing, craft, trade, and government administration. The percentage of the population (15 years and above) being economically active is 54.7% while 45.3 are not economically active. People employed into service and as sale workers constitute
32.5% of the employed population, 23.6% are into craft and trade, 13.2% as professionals and the remaining 30.7 for other categories (GSS, 2010).

3.2.5. Health and Diseases

Major health facilities are found in the core areas of Cape Coast and its immediate surroundings. The Metropolis has 18 health institutions, out of this, 12 are government and 6 are private based. Three out of these institutions are hospitals (Central regional hospital, Metropolitan hospital and University hospital) leaving the others to be health centres, clinics chip compounds and others (MPC, 2014).

The most common diseases found in the Metropolis include Malaria, Upper Respiratory Tract Infection, Diarrhoeal diseases (cholera), Acute Eye Infection, Hypertension, Anaemia, Skin diseases, Typhoid, Diabetes Mellitus and Intestinal worms. Out of these, Malaria and upper respiratory tract infection are the two most prevalent (MPC, 2014).

3.2.6. Religion

The Metropolis comprises people with different religious backgrounds. The most dominant religion is Christianity which accounts for 85.1% of the total population. This is being followed by Islam which accounts for 9.7% of the population and traditional religion making 0.3% of the entire population. The percentage of the population which do not have any religious affiliation constitute 3.9% (GSS, 2010).

3.2.7. Education

The Metropolis serves as the hub of education in the Central Region. It is made of several schools which include basic, second cycle and tertiary. Almost all the second cycle institution are concentrated in the core of Cape Coast, especially in the urban areas. The only public university found in Central Region as well as the only technical university are located in the Metropolis (MPC, 2014). The percentage of the population, 3 years and above in tertiary is 34.4%, 11.4% are in SHS, 13.1% in JHS and 27% in primary (GSS, 2010).
Figure 3.1: Map of Cape Coast Metropolitan Area

Source: Author’s Construct, 2018
3.3. Research Design and Techniques

The study employed the case study design in its approach. Rutterford (2012) defined a case study as providing information on a single community, person, items or groups to gain in-depth understanding of the phenomenon being studied. Simons (2009) has noted that, case study designs provides an insightful analysis about the subject under study. This helps to explain and describe the phenomenon proper as indicated by Yin (2003). The study adopted the case study design because, in studying a single city, which is Cape Coast Metropolis, it helped to give an in-depth understanding of the Metropolis with regards to children’s faecal matter disposal and how it leads to the spread of Cholera.

The study employed a mixed research method strategy. It is regarded as a concept of merging different methods in a single research (Odikro, 2014; Creswell, 2009). The mixed method employs both quantitative and qualitative methods. With quantitative approach, generalization is easy to do because there are a lot of ways to calculate variables and it requires extensive statistical analysis. It gives just a narrow perception of the issue and more explorative. Methods under quantitative research include correlation, descriptive design, causal comparative and quasi experiment. Instruments for quantitative study include questionnaires. The merits of conducting quantitative research approach is that; it eliminates bias, it has a standard procedure for validating the outcome of the result and others (Teye, 2012).

In a qualitative research, social behavior is being studied and is inductive. It mostly involves human subject and gives more accurate description of individuals or groups of people. In-depth interview, focus group discussions, observations and case study are some instruments for gathering qualitative data. Its merits include the following; it is individualistic, which means it gives more information about the individual. It is also less dependent on instrument and then fills the gap between research and practice. Disadvantages of using only qualitative method
include lack of objectivity and recognition. It is strongly dependent on the sample population and does not take into consideration the larger sample size etc (Teye, 2012).

The use of both qualitative and quantitative (mixed research) methods was as a result of both approaches having weaknesses (Teye, 2012). Mixed method approach is the use of both qualitative and quantitative methods in a single research. Advantages of using mixed method in a single research includes the following; it helps one method to complement the other, it helps in expansion, there is development of method, one is able to seek convergence and corroboration, and then for the purpose of initiation. (Johnson & Onwuegbuzie, 2004). There are some shortcomings with using the mixed method strategy despite its advantages. Johnson & Onwuegbuzie (2004) has noted that, merging both quantitative and qualitative approaches in a single research can be time consuming and expensive. Also, there is difficulty in finding an experienced researcher to integrate the two methods. Moreover, analyzing both data and interpreting conflicting results can be very challenging. Notwithstanding, the study adopted the mixed method strategy in collecting detailed information due to the complexity of issues.

With regards to this study, it was intended to examine and assess how socio-economic and cultural factors have influenced methods of children’s faecal matter disposal and its adverse effect on the spread of cholera. Quantitatively, questionnaire was used to gather information on socio-economic and cultural background of household, methods adopted by such households in handling children’s faecal matter and household’s exposure to the spread of cholera. These data were then coded using SPSS and statistical tools such as frequencies, charts, and percentages, logistic regression and chi square to generate tables and charts for the study. Based on the tables and charts, methods adopted by households in handling children’s faecal matter was comprehended as well cholera contraction.

Qualitatively, in depth interview was used to solicit information from health personnel, sanitation experts and assemblymen in order to understand their contributions and efforts in
managing children’s faeces among households in Cape Coast Metropolis, as well as gaining more insight on the trend of cholera in the Metropolis. Information from focus group discussion and observations on sanitation, children’s faecal matter disposal and knowledge on cholera were gathered from households and to enhance the quantitative findings. The use of both methods helped in dealing with all the needed information in the research problem.

The mixed method approach provided a comprehensive information and understanding into the driving factors accounting for methods of children’s faecal matter disposal in Cape Coast Metropolis, as well as its influence on the spread of cholera.

3.4. Data Sources

Primary and secondary data were used as source of data collection. Primary data was done by the use of questionnaires. Data for the research consisted of socio-economic background of the people in the study area. Social data consisted of Age, Sex, type of residence, and level of education. Economic data also considered issues such as occupation and cost for usage of latrine. Secondary data was taken from publications, articles, reports, journals and books on sanitation, children’s faecal matter, cholera issues and description of the study area. Data on cholera cases recorded over the years was taken from the Metropolitan Health Directorate. This helped know work done in relation to the subject and records to support discussions to make valid analysis, conclusions and recommendations.

3.5. Research Instrument

Quantitatively, questionnaire was the main instruments for data collection. This enabled individual households to participate in the study. Teye (2012) has noted that, questionnaires gives measurement, causality, generalization and replication as well as ensures reliability and validity of finding which is best for academic study. The questionnaire was made up of open and close-ended questions. Questions in the questionnaire were translated into Fante and Twi for those respondents who could not speak English. The questions were organised into sections.
The first section focused on the socio-demographic background of household respondents while the other sections focused on the research objectives. They were used in order to get a standard form of answers or responses.

In-depth interviews, focus group discussion and observation were used as means of collecting qualitative information. The in-depth interview was carried out with people who were knowledgeable with policies and practices surrounding children’s faecal matter management and cholera issues. These people comprised some stakeholders and key informants from Urban Waste Management, Development Planning Department, Health Directorate, Environment and Sanitation Department, Chiefs and Assembly Members. Marshall (1996) has indicated that interviews from key informants supplement the research information since the questionnaire sample are often of small size to enable the various stakeholders to participate.

Direct observation on faecal facilities, sanitation facilities, drainage, solid waste, water and the current state of their surroundings was spotted and gathered as firsthand information. This was assessed together with pictorial evidence to enrich the discussion.

There was also a focus group discussion from a particular group of people. Ho (2006) has noted that, information from focus group discussion explores insights that would have remained hidden. The discussion should be between a group of five to ten people who have gathered to share their experiences and ideas. The moderator who is the researcher led the discussion with planned series of questions and topics. To ensure effective participation, a focus group discussion among mothers with children 5 years and below was engaged. In all three focus group discussions were organised for the study. Each group had seven members.

3.6. Target Population

The study covered households in Cape Coast Metropolis. Three communities namely Cape Coast, Abura and Amamoma was selected to represent the Metropolis. By virtue of the
relatively large population size, a sample was used for the study rather than a complete census. The study focused on households with children 5 years and below. Qualitatively, 10 participants were contacted for the in-depth interview. This consisted of 4 stakeholders from Urban Waste Management, Development Planning Department, Health Directorate, Environment and Sanitation Department; 3 key informants and 3 Assembly Members. The target group for focus group discussion was among 7 caregivers (mothers) who had children 5 years and below in each of the three groups.

3.7. Sample Size Determination and Sampling Procedure

3.7.1. Quantitative Study - Questionnaire

Yamane formular for sample size determination was adopted for the study (Mora & Kloet, 2010).

\[ n = \frac{N}{1 + N(e)^2} \]

where \( n \) = Sample size, \( N \) = Population, and \( E \) = Level of precision

With households of 40,386 and level of precision of 5%, the sample size was calculated as

\[ n = \frac{40,386}{1 + 40,386(0.05)^2} \]

\[ n = \frac{40,386}{1 + 40,386(0.0025)} \]

\[ n = \frac{40,386}{1 + 100.965} \]

\[ n = \frac{40,386}{101.965} \]

\[ n = 396.077 \]

\[ n = 396 \]

A total of 396 sample size was derived from the Yamane formula. However, due to time constraints, limited resources, unwillingness and unavailability of some respondents, and for convenience, 300 respondents were chosen.

To get the sample size being distributed for the three communities, the proportion method by Bowley (1926) was adopted which is;
n=P/TP *S where, n= number of sampled respondent, P=Household population of a particular community, TP=Total household population of the three communities, S= Desired sample size.

Table 3 1: Distribution of Respondents in Selected Communities: Cape Coast, Abura and Amamoma

<table>
<thead>
<tr>
<th>Community</th>
<th>Household Population</th>
<th>Sample Size</th>
<th>Adjusted size</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cape Coast (Low income)</td>
<td>26,952</td>
<td>186</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Abura (Middle income)</td>
<td>16,021</td>
<td>110</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Amamoma High income)</td>
<td>579</td>
<td>4</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>43,552</td>
<td>300</td>
<td>300</td>
<td></td>
</tr>
</tbody>
</table>

There was difficulty in arriving at a representative sample size for each community due to their large differences in terms of household population, therefore an adjustment was made to the calculated sample size of each community to arrive at a fair output for the study (Table 3.1). The homogeneity of simple random sampling best fitted in administering the questionnaires to households in the various communities.

A multi-stage sampling technique was employed for the quantitative survey. To begin with, stratified sampling was used to group the Metropolis into five zones. This was done based on the Cape Coast Metropolitan Assembly Zonal Council demarcations. Thus Abura – Pedu zone, Amanful – Ntsin Zone, Ola – University zone, Aboom – Bakano zone and Efutu – Kokoado Mpeasem zone. These zones were further stratified into low, middle and high income areas following the demarcations of the Ghana Statistical Service (GSS, 2010). This is to help the researcher to know which income group or category adopt a particular method of children’s faecal disposal as well as sanitation practices. Low income areas include Efutu – Kokoado Mpeasem and Amanful zones, middle income area include Abura – Pedu and Aboom – Bakano zones and lastly Ola – University zone represent high income areas. Three communities (cholera prone communities) were selected for the study in which one community
was chosen from each income strata based on the purpose of the study through simple random. Thus, the names of first five cholera prone communities from each income zone were written on pieces of paper and placed in a boxes. The boxes were shaken for several times and one paper with community name from each box which were picked randomly formed the sample for the study. Cape Coast was chosen for low income category, Abura for middle income category and Amamoma for high income category. As indicated by WHO&UNICEF (2014), children within the age bracket of 0-5 are unable to use the latrine and have to use other means. It was therefore appropriate to undertake a random selection of households with children 5 years and below for the study.

3.7.2. Qualitative Survey

3.7.2.1. In-depth Interview

Qualitatively, purposive sampling was used to select 10 stakeholders and key informants for the interview for the study in order to get in-depth knowledge on the issue concerned. Studies have shown that interviews are mainly for meaning and processing hence do not necessarily require large sample sizes. It further suggests that qualitative interview figure could be between 20-40 (Teye, 2012). The study however focused on 10 stakeholders due to time constraints, resources and schedules of stakeholders. Institutions who are into health and sanitation were contacted as well as assembly members of the selected communities. Table 3.2 presents a breakdown of the total number of interviews conducted.
Table 3.2: Stakeholders and Number of Interviews Conducted

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Number Interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Waste Management Department</td>
<td>1</td>
</tr>
<tr>
<td>Environment, Health and Sanitation Department</td>
<td>1</td>
</tr>
<tr>
<td>Metropolitan Health Directorate</td>
<td>1</td>
</tr>
<tr>
<td>Development Planning Department</td>
<td>1</td>
</tr>
<tr>
<td>Assembly Members</td>
<td>3</td>
</tr>
<tr>
<td>Traditional Leaders</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
</tr>
</tbody>
</table>

3.7.2.2. Focus Group Discussion

A total of 21 respondents were engaged in the focus group discussion. Purposive sampling technique was used to select caregivers with children 5 years and below in the three communities. The simple random sampling was then used to select 7 members from each community for the focus group discussion. A date and a time was fixed for the discussion.

3.8 Data Analysis

There was a cross check on the data collected from the field to make sure they were correct and had no error in them. Completed questionnaires were coded and inputted into the computer using Statistical Product and Service Solutions (SPSS Version 23). The unit of analysis was households. Categorical data such as religion, education, marital status and age were analysed with the use of frequencies and percentages. Chi square test was used to analyse the significant association between dependent (place of residence) and independent variables (state of sanitation) and binary regression for methods of children’s faecal matter disposal and socio-demographic factors. A p-value of < 0.05 was considered statistically significant. There were composite scoring of a set of questions that sought to examine the current state of
sanitation in the two sub metros and methods of children faecal matter disposal by households in order to arrive at a score. Sanitation was grouped as improved or unimproved and methods of children faecal disposal depicted as safe or unsafe based on the overall score. Households that scored more than 50% were considered to have improved sanitation and practice safe children faecal disposal while households who scored less than 50% were considered to have unimproved sanitation and practice unsafe children’s faecal disposal. Multivariate logistic regression was used to analyse the relationship between spread of cholera and methods of children faecal disposal controlling other factor such as education, age, income, and food bought outside.

With objective one, descriptive statistics such as percentages, frequencies and charts were used to rate the current sanitation status in the Metropolis. Also, a chi square test was run on place of residence and the overall state of sanitation in the Metropolis taking into consideration waste disposal practices adopted by households. Qualitatively, information from interviews were used to support it. Binary logistic regression was used to assess the relationship between methods of children’s faecal matter disposal and associated factors such as income, age, education, knowledge of households on children’s faecal handling and toilet availability in households. Objective three employed binary logistic regression to quantitatively analyse the relationship between exposure to cholera and methods of children’s faecal matter disposal controlling age group, income level, education, knowledge, source of drinking water and food bought along roadside. Information from focus group discussion and in-depth interview was used to support it.

Descriptive statistics such as frequencies and percentages were used to analyse objective four, as well as documentation of interview and focus group discussion reports.
3.9 Ethical Consideration

A letter of application was sent to Dodowa Health Research Ethics Review Committee for ethical clearance and after several reviews, permission was granted for the study. All rules/procedures/policies set forth by ethical principles were duly followed. Respondents were informed about the objectives of the study and their consents were sought before a questionnaire was administered to each respondent for completion and those who encountered difficulties were assisted. Anonymity and confidentiality were ensured as the researcher informed respondents not to write their names on the questionnaires. The respondents were also informed that, participation was voluntary and that they could withdraw from participating in the study anytime.
CHAPTER FOUR: ANALYSIS AND DISCUSSIONS

CURRENT SANITATION STATE IN CAPE COAST METROPOLIS

4.1 Overview

This chapter presents the socio-demographic background of respondents, the state of sanitation and children’s faecal matter disposal practices adopted by households and driving factors such as education, income, time and space. It makes the necessary discussions using frequency tables, percentages, chi square. The analysis was done by presenting them in figures and tables of the data and using narratives to explain them.

4.2 Socio-Demographic Profile of Households

The background characteristics of households involved in the study is presented in table 4.1. Out of the 300 households for the study, 26.67% were males while 75.33% were females. This means that females are mostly at home more often and will have the ability to handle children faeces. Household respondents between the ages of 31 to 40 years dominated the study with 43.00% (Table 4.1). Also, most household respondents representing 72.33% were married while 9.6% were single and had never been married before. Respondents who were widowed constituted the least percentage (7.67%).

Majority of the respondents representing 79.00% were recorded to be Christians while 19% and 2% were Muslims and traditionalists respectively. An appreciable number of respondents constituting 84.66% had some form of formal education (basic to tertiary) as against 46 respondents (15.33%) with no formal education. Taking into consideration the kind of occupations respondents are into, it was noted that a majority of the respondents (62.67%) were traders followed by craftsmen/artisans who formed 14.00% of the study. 11.33% of respondents who indicated others were students while 10.33% and 1.67% of the household’s respondent were found to be civil servants and unemployed respectively (Table 4.1).
<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>74</td>
<td>24.67</td>
</tr>
<tr>
<td>Female</td>
<td>226</td>
<td>75.33</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 – 30 years</td>
<td>55</td>
<td>18.33</td>
</tr>
<tr>
<td>31 – 40 years</td>
<td>129</td>
<td>43.00</td>
</tr>
<tr>
<td>41 – 50 years</td>
<td>72</td>
<td>24.00</td>
</tr>
<tr>
<td>51 – 60 years</td>
<td>36</td>
<td>12.00</td>
</tr>
<tr>
<td>Above 60 years</td>
<td>8</td>
<td>2.67</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single and never married</td>
<td>29</td>
<td>9.67</td>
</tr>
<tr>
<td>Married</td>
<td>217</td>
<td>72.33</td>
</tr>
<tr>
<td>Divorced/Separated</td>
<td>31</td>
<td>10.33</td>
</tr>
<tr>
<td>Widowed</td>
<td>23</td>
<td>7.67</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christianity</td>
<td>237</td>
<td>79.00</td>
</tr>
<tr>
<td>Islam</td>
<td>57</td>
<td>19.00</td>
</tr>
<tr>
<td>Traditional</td>
<td>6</td>
<td>2.00</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal Education</td>
<td>46</td>
<td>15.33</td>
</tr>
<tr>
<td>Basic</td>
<td>136</td>
<td>45.33</td>
</tr>
<tr>
<td>Secondary/Technical</td>
<td>76</td>
<td>25.33</td>
</tr>
<tr>
<td>Tertiary</td>
<td>42</td>
<td>14.00</td>
</tr>
<tr>
<td><strong>Occupation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trading</td>
<td>188</td>
<td>62.67</td>
</tr>
<tr>
<td>Civil Servant</td>
<td>31</td>
<td>10.33</td>
</tr>
<tr>
<td>Craftsmen/Artisans</td>
<td>42</td>
<td>14.00</td>
</tr>
<tr>
<td>Unemployed</td>
<td>5</td>
<td>1.67</td>
</tr>
<tr>
<td>Others</td>
<td>34</td>
<td>11.33</td>
</tr>
<tr>
<td><strong>Communities</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cape Coast</td>
<td>150</td>
<td>50.0</td>
</tr>
<tr>
<td>Abura</td>
<td>100</td>
<td>33.33</td>
</tr>
<tr>
<td>Amamoma</td>
<td>50</td>
<td>16.67</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 100</td>
<td>59</td>
<td>19.67</td>
</tr>
<tr>
<td>101 – 200</td>
<td>43</td>
<td>14.33</td>
</tr>
<tr>
<td>201 – 300</td>
<td>65</td>
<td>21.67</td>
</tr>
<tr>
<td>301 – 400</td>
<td>40</td>
<td>13.33</td>
</tr>
<tr>
<td>401 – 500</td>
<td>32</td>
<td>10.67</td>
</tr>
<tr>
<td>Number of people in the house</td>
<td>61</td>
<td>20.33</td>
</tr>
<tr>
<td>------------------------------</td>
<td>----</td>
<td>-------</td>
</tr>
<tr>
<td>Below 6</td>
<td>56</td>
<td>14.14</td>
</tr>
<tr>
<td>6 – 10</td>
<td>216</td>
<td>54.55</td>
</tr>
<tr>
<td>11 – 20</td>
<td>85</td>
<td>21.46</td>
</tr>
<tr>
<td>21 – 30</td>
<td>28</td>
<td>7.07</td>
</tr>
<tr>
<td>Above 30</td>
<td>11</td>
<td>2.78</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Household size</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 6</td>
<td>62</td>
<td>20.67</td>
</tr>
<tr>
<td>6 – 10</td>
<td>176</td>
<td>58.67</td>
</tr>
<tr>
<td>11 – 20</td>
<td>49</td>
<td>16.33</td>
</tr>
<tr>
<td>21 – 30</td>
<td>10</td>
<td>3.33</td>
</tr>
<tr>
<td>Above 30</td>
<td>3</td>
<td>1.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Children</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 5</td>
<td>233</td>
<td>77.67</td>
</tr>
<tr>
<td>6 – 10</td>
<td>52</td>
<td>17.33</td>
</tr>
<tr>
<td>11 – 20</td>
<td>14</td>
<td>4.67</td>
</tr>
<tr>
<td>Above 20</td>
<td>1</td>
<td>0.33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Children under 5 years</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – 3</td>
<td>275</td>
<td>91.67</td>
</tr>
<tr>
<td>4 – 6</td>
<td>23</td>
<td>7.67</td>
</tr>
<tr>
<td>7 – 10</td>
<td>1</td>
<td>0.33</td>
</tr>
<tr>
<td>Above 10</td>
<td>1</td>
<td>0.33</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Material used for Building</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mud/Clay</td>
<td>37</td>
<td>12.33</td>
</tr>
<tr>
<td>Wood</td>
<td>7</td>
<td>2.33</td>
</tr>
<tr>
<td>Cement Block</td>
<td>251</td>
<td>83.67</td>
</tr>
<tr>
<td>Sand Crete</td>
<td>5</td>
<td>1.67</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>300</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

However, 21.67% of households received average monthly income of 201.00 to 300.00, while 32 respondents constituting 10.67% received average monthly income of 401 to 500 (Table 4.1). Table 4.1 further shows that, a majority of the houses were occupied by 6-10 individuals with houses having above 30 individuals constituting the least (2.7%). With regards to household size, 58.67% of households had 6 – 10 individuals while 3 households representing 1.00% had above 30 individuals. A majority of the households (91.7%) indicated that they have 1-3 children under five years. This was followed by (7.7%) respondents with 4-
6 children under five years in their households and (0.33%) respondents indicated they have 7-10 and above 10 children below five years. Table 4.1 finally presents that, a majority (83.7%) of the respondents lived in houses built with cement block. This was followed by (12.3%), (2.3%) and (1.7%) households who indicated mud/clay, wood and sandcrete as materials used to build the houses they live in.

4.3 Current sanitation status of Cape Coast Metropolis

Table 4.2: Respondents rating of sanitation situation in Cape Coast Metropolis

<table>
<thead>
<tr>
<th>Rate</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
<td>12</td>
<td>4.00</td>
</tr>
<tr>
<td>Good</td>
<td>87</td>
<td>29.00</td>
</tr>
<tr>
<td>Bad</td>
<td>78</td>
<td>26.00</td>
</tr>
<tr>
<td>Very Bad</td>
<td>123</td>
<td>41.00</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: Field Survey, 2018

Table 4.2 presents the results of how households rate sanitation in the Cape Coast Metropolis. As indicated by households, 41% households representing majority rated sanitation to be very bad. This was followed by 29% households who said sanitation was good, and then 26% and 4% rated sanitation to be bad and very good respectively. This was supported by a response from one respondents during the focus group discussion as;

“Sanitation in this area is very bad. The Metropolis stinks more often. This is because people throw rubbish anywhere. You meet rubbish wherever you pass. They are found in gutters and open space. These rubbish choked the gutters which does not allow water to flow easily when it rains. And when the water does not move and become stagnant, it produce bad scent which make the area smell. People also defecate into drains, especially during the night and at dawn’’ (Respondent 1 of FDG, Cape Coast).

This is in line with a statement made by the Metropolitan Planning Committee in their report that, sanitation is still a challenge in the Cape Coast Metropolis. The issue of improper disposal of refuse in the open and drains as well as open defecation is on the high (MPC. 2014).
Another studies by Awere et al., (2016) also conforms to it as it states that sanitation is very bad in most urban centers in Ghana of which Cape Coast Metropolis form part.

Table 4.3: Respondents reasons for rating sanitation situation

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper disposal practice</td>
<td>96</td>
<td>32.00</td>
</tr>
<tr>
<td>Open defecation</td>
<td>55</td>
<td>18.33</td>
</tr>
<tr>
<td>Improper disposal of refuse</td>
<td>147</td>
<td>49.00</td>
</tr>
<tr>
<td>Inadequate sanitation facilities</td>
<td>2</td>
<td>0.67</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>300</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>


Trying to find out respondents’ reasons for rating sanitation in the Metropolis, it was found that the majority 147 (49%) of the respondents who rated sanitation to be bad was as a result of improper disposal of refuse. This was followed by 96 (32%) respondents who indicated proper disposal practices to good sanitation. Open defecation accounted for 55 (18.3%) while 2 (0.67%) gave reasons as inadequate sanitation facilities (Table 4.3). Studies have shown that improper disposal of refuse (littering around), open defecation and lack of basic sanitation facilities have accounted for bad or unsafe sanitation in most areas while proper disposal of both solid and liquid waste together with availability of improved sanitation facilities such as latrines and solid waste collectors promote good sanitation (World Bank, 2017; Kosek et al., 2003). The results found in this study was similar, the majority of the respondents attributed improper disposal and open defecation to bad sanitation while most respondents on the other hand attributed proper disposal practice to good sanitation.
Plate 4.1: Choked gutter with refuse and stinking water in Cape Coast Metropolis

Source: Field Survey, 2018

Plate 4.1 shows an open gutter in the core of the Metropolis (Ntsin). It is the biggest drain in the area which is used for multipurpose task. It has in it refuse, faeces, stinking water. This same drain serves as a playing field for the youth in the community during the evenings and also for other ceremonial functions. It is being surrounded by houses where people live which become dangerous to their health.
Plate 4.2: Household gutter with refuse in Cape Coast Metropolis

Source: field Survey, 2018

Plate 4.2 depicts a household gutter located within a house which people live in. Children in that house play in and around the gutter. As seen in the gutter, the solid substances in it make it choked which prevents water from flowing easily.
Plate 4.3 shows an open drain right at the back of a public toilet. This drain has faeces all over its edges. This is because the public toilet is not kept clean which makes most inhabitants to defecate and dispose children’s faeces into it. This is what one indigene had to say concerning the drain:

“The drain serves as a means of transporting faeces from the public toilet into the sea anytime it is full. This has made the drain to produce bad scent. Food items are being sold close to the drain which becomes dangerous to people’s health” (Respondent 3 of FDG, Abura).
Based on the definition of sanitation by Water Supply and Sanitation Collaborative Council [WSSCC] (2009) which focuses on human excreta and waste disposal, as well as water accessibility, the overall state of sanitation for Cape Coast Metropolis was computed for. Table 4.4 presents the overall state of sanitation in the study communities taking into consideration toilet disposal, accessibility and availability, waste disposal methods and water accessibility. Sanitation in Cape Coast Metropolis was seen to be generally good (improved) as reported by 62% household respondents while only 38% were reported to have unimproved sanitation. This confirmed a statement made by the metropolitan waste management officer:

‘‘On average, I will say there has been an improvement in sanitation over the years. On percentage wise, I will say 50 – 70%. When it comes to refuse disposal, there has been improvement but open defecation is what is on high rate’’ (Metropolitan Waste Officer).

Table 4.4: Overall current state of sanitation in the study communities

<table>
<thead>
<tr>
<th>Variable of Sanitation</th>
<th>Place of residence</th>
<th>Chi², p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cape Coast</td>
<td>Abura</td>
</tr>
<tr>
<td>Improved</td>
<td>60 (40.00)</td>
<td>79 (79.00)</td>
</tr>
<tr>
<td>Unimproved</td>
<td>90 (60.00)</td>
<td>21 (21.00)</td>
</tr>
<tr>
<td>Total</td>
<td>150 (100.00)</td>
<td>150 (100.00)</td>
</tr>
</tbody>
</table>

Numbers in parentheses are percentages while those not in parentheses are the respondent counts; * means significant difference at p < 0.050.


The overall state of sanitation among the three communities was computed for and it was noted that majority of households representing 94.00% in Amamoma (high income community) had improved sanitation against 40.00% households in Cape Coast (low income community) with improved sanitation. However, it was seen that 60% of households in Cape
Coast (low income community) had unimproved sanitation while 6.00% in Amamoma (high income community) had unimproved sanitation. A chi square of 64.81 with p-value of 0.000 indicated a significant relationship between place of residence and state of sanitation in Cape Coast Metropolis. While improved sanitation was high in the high income communities of the Metropolis, unimproved sanitation on the other hand was high in low income communities of the Metropolis (Table 4.4). The World Bank has noted that, there can be improved sanitation when there is containment through safe collection, and treatment of end use disposal (World Bank, 2007). This implies that sanitation varies in terms of location or region and as indicated by (WHO/UNICEF, 2017), regional disparities in sanitation exist and is very huge. A similar studies conducted by Boadi (2008) on residents’ attitudes and perception on sanitation and health in Cape Coast Metropolis revealed a significant relationship between sanitation and residence of households. That is, where households in high income areas had improved sanitation, households in middle and low income locations had unimproved sanitation. This is also consistent with the statement made by the Metropolitan Environment, Health and Sanitation officer in an interview:

“Most households in high income areas in this Metropolis practice good sanitation compared to areas within the low income categories. This is because, high income areas have access improved and adequate sanitation facilities. The nature and characteristics their environment, as well as background of the people also inform them on sanity living. Most people in this category are literate as compared to the low income areas” (Metropolitan Health, Environment and sanitation Director).
METHODS OF CHILDREN’S FAECAL MATTER DISPOSAL AND ASSOCIATED FACTORS

4.4 Children’s faecal matter disposal practices and facilities in Cape Coast Metropolis

Table 4.5 presents the result of children’s faecal matter disposal practices adopted by households in the Metropolis. Respondents were asked to respond to ways of disposing their children’s faeces. From the table, it can be seen clearly that, children’s faeces were mostly disposed into latrines by households and this accounted for 55% while 21.3% were thrown into drains, 16.7% into dumps and only 7% being buried by households. With regard to the duration children’s faeces is stored before disposal, 72.7% of households interviewed stored children’s faeces for less than 10 minutes, 20.67% stored it within 10 to 20 minutes, 5.33% of the households stored it for 20-30 minutes and 1.33% stored it for more than 30 minutes. This implies that, children’s faeces is mostly disposed into the latrine by households in Cape Coast Metropolis and its storage before disposal does not exceed 10 minutes. There was a significant relationship between ways of children’s faeces disposal and place of residence. While most household’s in Amamoma (High income community) and Abura (middle income community) use latrine as a means of child’s faecal disposal, only few households in Cape Coast (low income community) use the laterine. Some studies have indicated that, children’s faecal matter can be safely disposed when the child’s faeces is put or rinse into a latrine. On the other hand, an unsafe children’s faecal disposal is when the child’s faeces is disposed into a drain, garbage, left in the open, thrown into the soil or buried in an open space (Bawankule, 2017; Aidan et al, 2016 & Preeti et al, 2016). The result is the fact that, households in high income and middle income communities practice safe children’s faecal disposal as compared to those found in the low income area.

Concerning toilet provision in households, majority of the households representing 51.7% had no toilet facility while 48.3% of the households had toilet facility. Most households
in the Metropolis lacked toilet facility in their homes. In terms of toilet facility availability in households among the three communities, the study found out that majority (68%) of the households in Amamoma had toilet in their houses as compared to households in Abura and Cape Coast, where majority (51% and 58%) did not have toilet in their houses. A significant relationship \((X=10.705, p=0.005)\) existed between toilet facility availability and place of residence. This implies that, households within high income communities have toilet facility while households within low and middle income communities lack toilet facility. A report by UN-Habitat has indicated that a relationship exists between income and toilet provision. According to them high income communities have sanitation facilities (toilet) available in their households while low income people lack sanitation facilities (toilet facilities) in their households (UN-Habitat, 2003, p.167). The study was in line with the above statement, where most households within high income had toilet available in their homes while most households within low income lack toilet facility in their homes. This also conforms to observation made during the survey. It was observed that households within high income communities had toilets in their homes as compared to households within low income communities. This was the response given by a respondent during the focus group discussion in Cape Coast:

“I do not have toilet in my house because there is not enough money to build one. The cost involved in building toilet is huge which I cannot afford. The money I get from my business is what I used to feed my family and even that one is not enough to take care of the family” (Respondent 2 of FDG, Cape Coast).

When households were asked the type of materials or containers their children defecate in, majority of them, 66.67% indicated potty, 29.33% said diapers, 1.33% reported napkins, 1.00% said on the ground and 1.67% used other means (Table 4.5). The role of latrines and products in promoting safe child faecal management practices has been discovered in several studies. This is consistent with studies by Gil et al., (2004) and Skyes, (2008) who found potties and diapers as the most and major materials used by households for children to defecate in.
Table 4.5: Children’s faecal matter disposal practices in Cape Coast Metropolis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Name of community</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cape Coast</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Abura</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amamoma</td>
<td></td>
</tr>
<tr>
<td>Ways of disposing children’s faeces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latrines</td>
<td>54 (36.0%)</td>
<td>165</td>
</tr>
<tr>
<td>Buried</td>
<td>15 (10.0%)</td>
<td>21</td>
</tr>
<tr>
<td>Thrown into dumps</td>
<td>35 (23.3%)</td>
<td>50</td>
</tr>
<tr>
<td>Drainage</td>
<td>46 (30.7%)</td>
<td>64</td>
</tr>
<tr>
<td>Total</td>
<td>150 (100%)</td>
<td>300</td>
</tr>
<tr>
<td>Chi², p-value</td>
<td>53.780, 0.000</td>
<td></td>
</tr>
<tr>
<td>Duration of storage of faeces before disposal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 10 minutes</td>
<td>106 (70.7%)</td>
<td>218</td>
</tr>
<tr>
<td>10 – 20 minutes</td>
<td>34 (22.7%)</td>
<td>62</td>
</tr>
<tr>
<td>21 – 30 minutes</td>
<td>8 (5.3%)</td>
<td>16</td>
</tr>
<tr>
<td>Above 30 minutes</td>
<td>2 (1.3%)</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>150 (100%)</td>
<td>300</td>
</tr>
<tr>
<td>Toilet facility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>62 (41.3%)</td>
<td>145</td>
</tr>
<tr>
<td>No</td>
<td>88 (58.7%)</td>
<td>155</td>
</tr>
<tr>
<td>Total</td>
<td>150 (100%)</td>
<td>300</td>
</tr>
<tr>
<td>Materials or containers the child defecates in</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potty</td>
<td>97 (64.7%)</td>
<td>200</td>
</tr>
<tr>
<td>Diapers</td>
<td>48 (32.0%)</td>
<td>88</td>
</tr>
<tr>
<td>Napkins</td>
<td>0 (0.0%)</td>
<td>4</td>
</tr>
<tr>
<td>On the ground</td>
<td>1 (0.7%)</td>
<td>3</td>
</tr>
<tr>
<td>Others</td>
<td>4 (2.7%)</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>150 (100%)</td>
<td>300</td>
</tr>
</tbody>
</table>

Numbers in parentheses are percentages while those not in parentheses are the respondent counts; * means significant difference at p < 0.050. Source: Field Survey, 2018

Table 4.6 shows the relationship between respondents’ educational level, containers child defecates in and storage of faeces before disposal. It was noticed that, most households (47.62%) with tertiary educated parents used diaper more as compared to households with no formal education, basic and SHS category. A significant relationship (X=27.37, p=0.007) exists between level of education and containers child defecates in. This implies that households with higher education attainment are able to afford diapers than those with lower or no education. The study also assessed the relationship between household’s level of education and duration of child faecal matter disposal. More households (72.67%) with tertiary education store children’s faeces for less than 10 minutes while household’s with no formal education, basic
and SHS (20.67%, 5.33% and 1.33%). However, there was no statistically significant relationship (X=16.59, p=0.056) between level of education and duration of child faecal matter disposal. This implies that one’s educational level will not have influence on duration taken to dispose children’s faecal matter.

Table 4.6: Relationship between respondents’ educational level, container child defecates in and storage of faeces before disposal

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level of Education</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Chi², p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Formal Education</td>
<td>Basic</td>
<td>SHS</td>
<td>Tertiary</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Containers child defecates in</td>
<td>Potty</td>
<td>33 (71.74)</td>
<td>91 (66.91)</td>
<td>54 (71.05)</td>
<td>22 (52.38)</td>
<td>200 (66.67)</td>
<td>27.37, 0.007*</td>
</tr>
<tr>
<td></td>
<td>Diapers</td>
<td>11 (23.91)</td>
<td>39 (28.68)</td>
<td>18 (23.68)</td>
<td>20 (47.62)</td>
<td>88 (29.33)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Napkins</td>
<td>0 (0.00)</td>
<td>0 (0.00)</td>
<td>4 (5.26)</td>
<td>0 (0.00)</td>
<td>4 (1.33)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>On the ground</td>
<td>0 (0.00)</td>
<td>3 (2.21)</td>
<td>0 (0.00)</td>
<td>0 (0.00)</td>
<td>3 (1.00)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>2 (4.35)</td>
<td>3 (2.21)</td>
<td>0 (0.00)</td>
<td>0 (0.00)</td>
<td>5 (1.67)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>46 (100.00)</td>
<td>136 (100.00)</td>
<td>76 (100.00)</td>
<td>42 (100.00)</td>
<td>300 (100.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of storage of faeces before disposal (minutes)</td>
<td>Below 10</td>
<td>34 (73.91)</td>
<td>97 (71.32)</td>
<td>55 (72.37)</td>
<td>32 (76.19)</td>
<td>218 (72.67)</td>
<td>16.59, 0.056</td>
</tr>
<tr>
<td></td>
<td>10 – 20</td>
<td>10 (21.74)</td>
<td>30 (22.06)</td>
<td>15 (19.74)</td>
<td>7 (16.67)</td>
<td>62 (20.67)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>21 – 30</td>
<td>2 (4.35)</td>
<td>8 (5.88)</td>
<td>6 (7.89)</td>
<td>0 (0.00)</td>
<td>16 (5.33)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Above 30</td>
<td>0 (0.00)</td>
<td>1 (0.74)</td>
<td>0 (0.00)</td>
<td>3 (7.14)</td>
<td>4 (1.33)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>46 (100.00)</td>
<td>136 (100.00)</td>
<td>76 (100.00)</td>
<td>42 (100.00)</td>
<td>300 (100.00)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Numbers in parentheses are percentages while those not in parentheses are the respondent counts; * means significant difference at p < 0.050.


Table 4.7 presents bivariate analysis between methods of children’s faeces disposal and factors such as age of respondents, educational level, toilet availability, income and knowledge of households on child’s faeces disposal. It can be observed from that table that toilet availability in households and income were statistically associated with methods of children’s faeces disposal. Majority (54.5%) of households with toilet practiced safe child faeces disposal while most (59.3%) households without toilet facility practiced unsafe child faecal disposal.
This implies that households with access to toilet in their house adopt safe child’s faecal disposal whereas households without toilet facility practiced unsafe child faecal disposal. With regards to income, it was noticed that households with, most (20%) households with monthly income of above 500.00 resort to safe children’s faecal disposal while most (23%) households with monthly income of 201.00 – 300.00 resort to unsafe children’s faecal disposal. There was statistical relationship between household’s average monthly income and methods of child faecal disposal. Households with high average monthly income practice safe child faecal disposal whereas households with low average monthly income practice unsafe child faecal disposal. This corresponds to studies that, high income earners are more times higher to adopt safe children’s faeces disposal than low income earners (Azage et al., 2015; Cronin et al., 2016).
Table 4. 7: Bivariate analysis between methods of children’s faeces disposal and factors such as age of respondents, educational level, toilet availability, income and knowledge of households on child’s faeces disposal.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Methods of Children’s Faeces Disposal</th>
<th>Safe</th>
<th>Unsafe</th>
<th>Total</th>
<th>Chi², p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age(years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 - 30</td>
<td></td>
<td>30 (18.2%)</td>
<td>25 (18.5%)</td>
<td>55 (18.0%)</td>
<td>0.492, 0.974</td>
</tr>
<tr>
<td>31 - 40</td>
<td></td>
<td>71 (43.0%)</td>
<td>58 (43.0%)</td>
<td>129 (43.0%)</td>
<td></td>
</tr>
<tr>
<td>41 - 50</td>
<td></td>
<td>38 (23.0%)</td>
<td>34 (25.2%)</td>
<td>72 (24.0%)</td>
<td></td>
</tr>
<tr>
<td>51 - 60</td>
<td></td>
<td>21 (12.7%)</td>
<td>15 (11.0%)</td>
<td>36 (12.0%)</td>
<td></td>
</tr>
<tr>
<td>Above 60</td>
<td></td>
<td>5 (3.0%)</td>
<td>3 (2.2%)</td>
<td>8 (2.7%)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>165 (100%)</td>
<td>135 (100%)</td>
<td>300 (100%)</td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal</td>
<td></td>
<td>32 (19.4%)</td>
<td>14 (10.4%)</td>
<td>46 (15.3)</td>
<td>5.830, 0.120</td>
</tr>
<tr>
<td>Basic</td>
<td></td>
<td>67 (40.6%)</td>
<td>69 (51.1%)</td>
<td>136 (45.3%)</td>
<td></td>
</tr>
<tr>
<td>Secondary/ Technical</td>
<td></td>
<td>42 (25.5%)</td>
<td>34 (25.2%)</td>
<td>76 (25.3%)</td>
<td></td>
</tr>
<tr>
<td>Tertiary</td>
<td></td>
<td>24 (14.5%)</td>
<td>18 (13.3%)</td>
<td>42 (14.0%)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>165 (100%)</td>
<td>135 (100%)</td>
<td>300 (100%)</td>
<td></td>
</tr>
<tr>
<td><strong>Toilet facility</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td></td>
<td>90 (54.5%)</td>
<td>55 (40.7%)</td>
<td>145 (48.3%)</td>
<td>10.705, 0.005*</td>
</tr>
<tr>
<td>No</td>
<td></td>
<td>75 (45.5%)</td>
<td>80 (59.3%)</td>
<td>155 (51.7%)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>165 (100%)</td>
<td>135 (100%)</td>
<td>300 (100%)</td>
<td></td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 100.00</td>
<td></td>
<td>36 (21.8%)</td>
<td>23 (17.0%)</td>
<td>59 (19.7%)</td>
<td>5.666, 0.017*</td>
</tr>
<tr>
<td>101 - 200</td>
<td></td>
<td>24 (14.5%)</td>
<td>19 (14.1%)</td>
<td>43 (14.3%)</td>
<td></td>
</tr>
<tr>
<td>201 - 300</td>
<td></td>
<td>33 (20.0%)</td>
<td>32 (23.7%)</td>
<td>65 (21.7%)</td>
<td></td>
</tr>
<tr>
<td>301 - 400</td>
<td></td>
<td>27 (16.4%)</td>
<td>13 (9.6%)</td>
<td>40 (13.3%)</td>
<td></td>
</tr>
<tr>
<td>401 - 500</td>
<td></td>
<td>12 (7.3%)</td>
<td>20 (14.8%)</td>
<td>32 (10.7%)</td>
<td></td>
</tr>
<tr>
<td>500 and above</td>
<td></td>
<td>33 (20.0%)</td>
<td>28 (20.7%)</td>
<td>61 (20.3%)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>165 (100%)</td>
<td>135 (100%)</td>
<td>300 (100%)</td>
<td></td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adequate</td>
<td></td>
<td>157 (95.2%)</td>
<td>124 (91.9%)</td>
<td>281 (93.7%)</td>
<td>1.363, 0.243</td>
</tr>
<tr>
<td>Inadequate</td>
<td></td>
<td>8 (4.8%)</td>
<td>11 (8.1%)</td>
<td>19 (6.3%)</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>165 (100%)</td>
<td>135 (100%)</td>
<td>300 (100%)</td>
<td></td>
</tr>
</tbody>
</table>

Numbers in parentheses are percentages while those not in parentheses are the respondent counts; * means significant difference at p < 0.050.


A multivariate binary logistic regression was performed to predict methods of children’s faecal matter disposal as a function of variables such as availability of toilet facilities, level of education, income, age and knowledge about disposal methods. The results of the analysis is presented in Table 4.8. The results indicate that level of education, knowledge, income and age could not significantly predict methods of disposing the faecal matter of children. Nonetheless, availability of toilet facility significantly predicted the outcome variable. Respondents without toilet facility in their households were 2 times less likely to
adopt safer methods of disposing children’s faecal matter relative to those with toilets. (OR= 0.494, CI= 0.296 – 0.824). Studies have shown relationships between methods of children’s faecal matter disposal and toilet availability in households. For instance, a research by Bawankule et al, (2017) found unavailability of toilet facility in households to be statistically associated with unsafe children’s faecal disposal. Similar studies conducted in 38 countries in Sub-Saharan Africa and South Asia also came out with findings that, households with toilet facilities practiced safe children’s faecal disposal as compared to households without toilet facility (Sykes et al, 2016). This then is in line with the outcome of this study that, household’s in Cape Coast Metropolis without toilet facility were less likely to adopt safe methods of children’s faeces disposal.
Table 4.8: Multivariate Binary logistic regression coefficient estimating the effect of predictors such as availability of toilet, level of education, income, age and knowledge on handling children’s faeces.

<table>
<thead>
<tr>
<th>Predictors (Independent Variables)</th>
<th>B</th>
<th>S.E</th>
<th>Odds ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of toilet facility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have toilet facility (reference category)</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do not have toilet facility</td>
<td>-.706</td>
<td>.261</td>
<td>.494*</td>
<td>.296 -.824</td>
</tr>
<tr>
<td>Knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adequate (reference category)</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate</td>
<td>-.353</td>
<td>.511</td>
<td>.702</td>
<td>.258 – 1.913</td>
</tr>
<tr>
<td>Age of respondent</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-30 (reference category)</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41-50</td>
<td>.392</td>
<td>.790</td>
<td>1.479</td>
<td>.314 – 6.965</td>
</tr>
<tr>
<td>50-60</td>
<td>.423</td>
<td>.814</td>
<td>1.527</td>
<td>.309 – 7.532</td>
</tr>
<tr>
<td>Above 60 years</td>
<td>.500</td>
<td>.851</td>
<td>1.648</td>
<td>.311 – 8.734</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal education (reference category)</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basic</td>
<td>-.579</td>
<td>.523</td>
<td>.560</td>
<td>.201 – 1.563</td>
</tr>
<tr>
<td>Secondary/Technical</td>
<td>.264</td>
<td>.401</td>
<td>1.303</td>
<td>.594 – 2.857</td>
</tr>
<tr>
<td>Tertiary</td>
<td>-.014</td>
<td>.433</td>
<td>.986</td>
<td>.422 – 2.304</td>
</tr>
<tr>
<td>Average monthly income</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 100.00 (reference category)</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>101.00 – 200.00</td>
<td>-.353</td>
<td>.420</td>
<td>.702</td>
<td>.308 – 1.601</td>
</tr>
<tr>
<td>201.00 – 300.00</td>
<td>-.208</td>
<td>.453</td>
<td>.812</td>
<td>.334 – 1.975</td>
</tr>
<tr>
<td>301.00 – 400.00</td>
<td>-.131</td>
<td>.389</td>
<td>.877</td>
<td>.409 – 1.881</td>
</tr>
<tr>
<td>401.00 – 500.00</td>
<td>-.599</td>
<td>.466</td>
<td>.549</td>
<td>.220 – 1.370</td>
</tr>
<tr>
<td>501.00 and above</td>
<td>.544</td>
<td>.481</td>
<td>1.723</td>
<td>.671 – 4.419</td>
</tr>
</tbody>
</table>

*p<0.05, Methods of disposing children’s faecal matter (Safe- 1, and unsafe- 2) is the dependent variable.

Table 4.9 shows educational level of households and their knowledge on handling children’s faeces. Majority of respondents with some form of formal education (93.38%, 90.79% and 92.86%) were aware that child faeces is harmful as against respondents with no formal education (67.39% ), and there was a significant relationship (X=24.81, p=0.001) between household level of education and harmful awareness of children’s faecal matter. With regard to hand washing, all the households appreciated the essence of handwashing after
handling children’s faeces. Most households with or without some form of education used water and soap as detergents for washing hands. But there was a statistical significant association ($X=14.47$, $p=0.025$) between level of education and detergents for washing hands. Majority (9.25%) of household respondents without tertiary education added other detergents such as hand sanitizer as against 2.17% households without formal education. Again, a statistical association ($X=33.69$, $p=0.001$) existed between household educational attainment and detergents for washing faecal containers. While most (19.05%) households with tertiary education use parazon/Detol to clean their faecal containers, only a few (4.34%) of households without any form of formal education use parazone/detol to clean their faecal containers. With the duration it takes for households to dispose their children faeces after defecation, it was indicated that, majority of the households with different educational attainment dispose children’s faeces right after defecation. There was no significant relationship between educational level and duration taken in disposing child’s faeces.
Table 4.9: Relationship between respondents’ educational level and knowledge on handling faeces

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level of Education</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Chi², p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Formal Education</td>
<td>Basic</td>
<td>SHS</td>
<td>Tertiary</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are you aware that child faeces is harmful?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24.81, 0.001*</td>
</tr>
<tr>
<td>Yes</td>
<td>31 (67.39)</td>
<td>127 (93.38)</td>
<td>69 (90.79)</td>
<td>39 (92.86)</td>
<td>266 (88.67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>15 (32.61)</td>
<td>9 (6.62)</td>
<td>7 (9.21)</td>
<td>3 (7.14)</td>
<td>34 (11.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>46 (100.00)</td>
<td>136 (100.00)</td>
<td>76 (100.00)</td>
<td>42 (100.00)</td>
<td>300 (100.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detergents for washing hands</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14.47, 0.025*</td>
</tr>
<tr>
<td>Water</td>
<td>0 (0.00)</td>
<td>14 (10.29)</td>
<td>3 (3.95)</td>
<td>1 (2.38)</td>
<td>18 (6.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water and soap</td>
<td>45 (97.83)</td>
<td>114 (83.82)</td>
<td>72 (94.74)</td>
<td>37 (88.10)</td>
<td>268 (89.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>1 (2.17)</td>
<td>8 (5.88)</td>
<td>1 (1.31)</td>
<td>4 (9.52)</td>
<td>14 (4.67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>46 (100.00)</td>
<td>136 (100.00)</td>
<td>76 (100.00)</td>
<td>42 (100.00)</td>
<td>300 (100.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detergents for washing containers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>33.69, 0.001*</td>
</tr>
<tr>
<td>Soapy water</td>
<td>28 (60.87)</td>
<td>76 (55.88)</td>
<td>53 (69.74)</td>
<td>21 (50.00)</td>
<td>178 (59.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>1 (2.17)</td>
<td>9 (6.62)</td>
<td>1 (1.32)</td>
<td>2 (4.76)</td>
<td>13 (4.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soapy water and broom</td>
<td>15 (32.61)</td>
<td>21 (15.44)</td>
<td>8 (10.53)</td>
<td>11 (26.19)</td>
<td>55 (18.33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parazon/Detol</td>
<td>2 (4.34)</td>
<td>30 (22.06)</td>
<td>14 (18.42)</td>
<td>8 (19.05)</td>
<td>54 (18.01)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>46 (100.00)</td>
<td>136 (100.00)</td>
<td>76 (100.00)</td>
<td>42 (100.00)</td>
<td>300 (100.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of storage of faeces</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11.67, 0.070</td>
</tr>
<tr>
<td>Right after defection</td>
<td>44 (95.65)</td>
<td>114 (83.82)</td>
<td>66 (86.84)</td>
<td>42 (100.00)</td>
<td>266 (88.67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 – 10 minutes</td>
<td>2 (4.35)</td>
<td>18 (13.24)</td>
<td>9 (11.84)</td>
<td>0 (0.00)</td>
<td>29 (9.67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>More than 10 minutes</td>
<td>0 (0.00)</td>
<td>4 (2.94)</td>
<td>1 (1.32)</td>
<td>0 (0.00)</td>
<td>5 (1.67)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>46 (100.00)</td>
<td>136 (100.00)</td>
<td>76 (100.00)</td>
<td>42 (100.00)</td>
<td>300 (100.00)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Numbers in parentheses are percentages while those not in parentheses are the respondent counts; * means significant difference at p < 0.050. Source: Field Survey, (2018)
CHAPTER FIVE: ANALYSIS AND DISCUSSIONS

RELATIONSHIP BETWEEN RESIDENTS’ EXPOSURE TO CHILDREN’S FAECAL MATTER DISPOSAL IN CAPE COAST METROPOLIS AND SPREAD OF CHOLERA

5.1 Overview

This chapter presents the ways in which cholera is being contracted, household’s knowledge on cholera and stakeholders involvement in managing children’s faecal matter disposal to cholera prevention. It makes the necessary discussions using frequency tables, percentages, chi square and regression.

5.2 Ways of contracting cholera by households

Bivariate analysis on chi square test was used to analyse the relationship between methods of children’s faecal disposal and cholera. It was indicated that most households with safe child’s disposal are not likely to contract cholera whereas households with unsafe child faecal disposal are more likely to contract cholera. However, the result showed no statistical relationship between methods of child faecal disposal and cholera (Table 5.1).

Table 5.1: Relationship between methods of children’s faecal disposal and cholera contraction

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cholera Contraction</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
<th>Chi², p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methods of children’s faeces disposal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safe</td>
<td>33 (20.00)</td>
<td></td>
<td>132 (80)</td>
<td>165 (100)</td>
<td>0.104, 0.747*</td>
</tr>
<tr>
<td>Unsafe</td>
<td>25 (18.5)</td>
<td></td>
<td>110(81.5)</td>
<td>135 (100)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>58 (19.3)</td>
<td></td>
<td>242(80.7)</td>
<td>300 (100)</td>
<td></td>
</tr>
</tbody>
</table>

Numbers in parentheses are percentages while those not in parentheses are the respondent counts; * means significant difference at p < 0.050. Source: Field Survey, 2018
Table 5.2 went further to use binary logistic regression to predict cholera contraction and methods of children’s faecal disposal controlling factors such as knowledge, age of respondents, education, income, source of drinking water, roadside food bought and place of residence. The table revealed that, the odds of household with unsafe children’s faecal matter disposal getting cholera is 1 time more likely (OR; 1.444, 95% CI: 0.675 – 3.093) than households with safe children’s faecal matter disposal. However, contraction of cholera was not significantly associated with methods of disposing children’s faecal matter by households. Also, the odds of households with inadequate knowledge on harmfulness of children’s faecal matter getting cholera were 1 time more (OR; 1.004, 95 CI: 0.217 – 4.637) than households with adequate knowledge. With regards to age (s) of respondents the results revealed that, the odds of respondents aged 31-40 years getting cholera was six times more likely (OR; 6.103, 95%: CI: 0.751 – 49.598) than respondents aged 21-30years. However, age was not significantly associated with cholera contraction. It was further noticed that the odds of households with tertiary education attainment getting cholera was once more higher (OR; 1.137, 95% CI: 0.336 – 3.849) than households with no formal education but was not statistically related.

Dziedzom (2015) compared the relationship between household income and cholera, and found households with low income to be highly (45.6%) infected with cholera. This was in contrast with a study by Benjamin in 2018 that monthly income was not significant with cholera (Benjamin, 2018). Households contracting cholera was also dependent on monthly average income. Table 4.9 presents that, the odd of households with average monthly income of 201.00 – 300.00 getting cholera were 4 times less (OR; 0.258, 95% CI: 0.070 – 0.944) than households with average monthly income of less than 100.00. Also, the odds of households with average income of 501 and above getting cholera is 9 times less (OR; 0.144, 95% CI: 0.029 – 0.442) than households with monthly average income less than 100.00. This result
showed significant relationship between household monthly income and cholera contraction. This corresponds to the result by Dziedzorm in 2015 as stated initially.

Geographically, there was statistical relationship between place of residence and cholera contraction. It can be inferred from table 5.1 that, the odds of households in Abura and Amamoma to get cholera was two times higher (OR; 2.865, 95% CI: 1.065 – 7.707) (OR; 2.971, 95% CI: 1.157 – 7.632) than households in Cape Coast. Contraction of cholera was statistically associated with households who bought roadside food. The results revealed that, the odds of households who did not buy roadside food getting cholera were 5 times less (OR; 0.210, 95% CI: 0.098 – 0.451) than households who bought roadside food. A statistical relationship existed between food bought along roadside and cholera contraction.

Most studies have shown that poor child faecal management is a potential cause of diarrheal disease which could lead to death. For instance, a study conducted in Cebu, Philippines, in 2009 revealed a relationship between improper child faecal matter disposal and diarrhea (Sahey et al., 2015). In Burkina Faso, it was indicated that, a significant relationship exists between children’s faeces disposal and faecal oral diseases (Curtis et al, 2011). Similarly, in 2004, the outcome of a study by Aulia et al., in South Sumatra, Indonesia, revealed a significant relationship between improper disposal of child faeces and cholera (Aulia et al, 2004).

Despite all these evidences, the results of a multivariate binary logistic regression on methods of children’s faecal matter disposal and spread of cholera controlling for other variables was found not to be significant. This means that infected persons can transmit it, so children not infected will not necessarily transmit it to their siblings or mothers caring for them irrespective of the faecal matter management practice used. When it comes to cholera, we are all exposed as shown in the study where a significant relationship existed between households who bought food outside and those who did not, and contraction of cholera. Households who
bought food outside getting cholera was higher than those who did not buy food outside. This is in line with a study by Dexit (2010) in Western Kenya that, 59.4% of households with cholera was as a result of eating food bought outside. Another bivariate analysis by Dzotsi (2014) showed a significant relationship between eating food sold outside home and cholera. Households who ate food sold outside were six times more likely to be infected with cholera.

Below were statements made by two respondents from the focus group discussion who had experienced cholera in their household before.

**Respondent 1**

‘‘My ten years daughter got cholera last year. Reports from doctors indicated that she got it through eating contaminated food. And it was found that she bought the food on her way back from school’’ (Respondent 5 of FDG, Abura).

**Respondent 2**

‘‘About a year ago, I went to the market to sell my staffs and because I did not close early, I decided to get some rice and stew being sold around to eat before going home. I ate the food and left for the house. In about some hours’ time, I started feeling some pains in my stomach, vomiting continued and also had running stomach. I became so weak and I was rushed to the hospital. After the doctor examined me, I was diagnosed of cholera which was as a result of the food I ate’’ (Respondent 6 of FDG, Cape Coast).
Table 5.2: Multivariate binary logistic regression of cholera contraction and influential factors.

<table>
<thead>
<tr>
<th>Predictors (Independent Variables)</th>
<th>B</th>
<th>S.E</th>
<th>Odds ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Methods of children’s faecal disposal</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safe (reference category)</td>
<td>1.00</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Unsafe</td>
<td>.368</td>
<td>.388</td>
<td>1.444</td>
<td>.675 – 3.093</td>
</tr>
<tr>
<td><strong>Knowledge</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adequate (reference category)</td>
<td>1.00</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Inadequate</td>
<td>.004</td>
<td>.781</td>
<td>1.004</td>
<td>.217 – 4.637</td>
</tr>
<tr>
<td><strong>Age of respondent</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21-30 (reference category)</td>
<td>1.00</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>31-40</td>
<td>1.809</td>
<td>1.069</td>
<td>6.103</td>
<td>.751 – 49.598</td>
</tr>
<tr>
<td>41-50</td>
<td>.997</td>
<td>.974</td>
<td>2.711</td>
<td>.402 – 18.289</td>
</tr>
<tr>
<td>50-60</td>
<td>.860</td>
<td>.995</td>
<td>2.362</td>
<td>.336 – 16.600</td>
</tr>
<tr>
<td>Above 60 years</td>
<td>.390</td>
<td>1.031</td>
<td>1.477</td>
<td>.196 – 11.147</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal education (reference category)</td>
<td>1.00</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Basic</td>
<td>.070</td>
<td>.680</td>
<td>.932</td>
<td>.246 – 3.537</td>
</tr>
<tr>
<td>Secondary/Technical</td>
<td>1.212</td>
<td>.635</td>
<td>3.361</td>
<td>.967 – 11.660</td>
</tr>
<tr>
<td>Tertiary</td>
<td>.128</td>
<td>.622</td>
<td>1.137</td>
<td>.336 – 3.849</td>
</tr>
<tr>
<td><strong>Average monthly income</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 100.00 (reference category)</td>
<td>1.00</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>101.00 – 200.00</td>
<td>-.072</td>
<td>.645</td>
<td>.931</td>
<td>.263 – 3.298</td>
</tr>
<tr>
<td>201.00 – 300.00</td>
<td>-1.357</td>
<td>.663</td>
<td>.258*</td>
<td>.070 – .944</td>
</tr>
<tr>
<td>301.00 – 400.00</td>
<td>-.095</td>
<td>.659</td>
<td>.910</td>
<td>.250 – 3.307</td>
</tr>
<tr>
<td>401.00 – 500.00</td>
<td>-.194</td>
<td>.726</td>
<td>.824</td>
<td>.198 – 3.417</td>
</tr>
<tr>
<td>501.00 and above</td>
<td>-2.171</td>
<td>.691</td>
<td>.114*</td>
<td>.029 – .442</td>
</tr>
<tr>
<td><strong>Source of drinking water</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sachet (reference category)</td>
<td>1.00</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Pipe borne</td>
<td>-.435</td>
<td>.371</td>
<td>.648</td>
<td>.313 – 1.341</td>
</tr>
<tr>
<td><strong>Roadside food bought</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes (reference category)</td>
<td>1.00</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>-1.562</td>
<td>.391</td>
<td>.210*</td>
<td>.098 – .451</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cape Coast (reference category)</td>
<td>1.00</td>
<td></td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Abura</td>
<td>1.053</td>
<td>.505</td>
<td>2.865*</td>
<td>1.065 – 7.707</td>
</tr>
<tr>
<td>Amamoma</td>
<td>1.089</td>
<td>.481</td>
<td>2.971*</td>
<td>1.157 – 7.632</td>
</tr>
</tbody>
</table>

*p<0.05, Cholera contraction (Yes- 1, and No- 2) is the dependent variable.

Studies have shown that cholera is being transmitted through taking in contaminated food or water (Osei, 2010; Dzotsi et al., 2014). Figure 5.1 indicates how households contracted cholera. It was observed that, majority (45) of the households got cholera as a result of eating contaminated food while the least (13) households contracted cholera by drinking contaminated water.

![Figure 5.1 Source of contraction of cholera](http://ugspace.ug.edu.gh)

**Figure 5.1 Source of contraction of cholera**

**Source: Field Survey, (2018)**

Table 5.3 presents respondents’ views on education received on cholera. From the above, majority of the respondents, 173 (57.7%) indicated that they are timely educated and warned about cholera while 127 (42.3%) of the respondents received no education and are not warned about cholera. However, respondents were asked the last time of being educated or warned about cholera. The majority of the respondents, 55 (31.85%) indicated less than 3 months, while 45 (26.0%), 44 (25.4%), 21 (12.14%) and 8 (4.6%) of the respondents indicated always, 6 months ago, 1 year ago and less than a week respectively. Education on cholera in the Metropolis was found to be high. This was mostly done by the environmental health
directorate (Table 5.4). This confirmed response from the environmental Health Director during an interview with him:

“We have educational and promotional team which go round to educate and sensitize them on cholera prevention. We teach them basic hand washing techniques. There is also an introduction of basic hand washing cans. We are currently embarking on active campaigns in sensitizing people on cholera prevention. This is done with the help of some stakeholders such as USAID through global communities’ inspection and dedication. There are also plans to provide them with aqua pipes and teach them how to use it” (Environmental Health Director).

Table 5.3: Education on cholera in Cape Coast Metropolis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timely educated and warned about cholera</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>173</td>
<td>57.67</td>
</tr>
<tr>
<td>No</td>
<td>127</td>
<td>42.33</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>300</strong></td>
<td><strong>100.00</strong></td>
</tr>
<tr>
<td>The last time educated/warned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than a week</td>
<td>8</td>
<td>4.62</td>
</tr>
<tr>
<td>Always</td>
<td>45</td>
<td>26.01</td>
</tr>
<tr>
<td>Less than 3 month</td>
<td>55</td>
<td>31.79</td>
</tr>
<tr>
<td>6 month ago</td>
<td>44</td>
<td>25.43</td>
</tr>
<tr>
<td>1 year ago</td>
<td>21</td>
<td>12.14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>173</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

Numbers in parentheses are percentages while those not in parentheses are the respondent counts

Table 5.4: Institutions involved in cholera education in Cape Coast Metropolis

<table>
<thead>
<tr>
<th>Institutions</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Health Directorate</td>
<td>271 (90.33)</td>
<td>13 (4.33)</td>
<td>16 (5.33)</td>
<td>300 (100.00)</td>
</tr>
<tr>
<td>NADMO</td>
<td>70 (23.33)</td>
<td>66 (22.00)</td>
<td>164 (54.67)</td>
<td>300 (100.00)</td>
</tr>
<tr>
<td>Media</td>
<td>232 (77.33)</td>
<td>25 (8.33)</td>
<td>43 (14.33)</td>
<td>300 (100.00)</td>
</tr>
<tr>
<td>Environmental NGO’s</td>
<td>115 (38.33)</td>
<td>122 (40.67)</td>
<td>63 (21.00)</td>
<td>300 (100.00)</td>
</tr>
<tr>
<td>Social Groups</td>
<td>94 (31.33)</td>
<td>133 (44.33)</td>
<td>73 (24.33)</td>
<td>300 (100.00)</td>
</tr>
<tr>
<td>MMDAs</td>
<td>241 (80.33)</td>
<td>21 (7.00)</td>
<td>38 (12.67)</td>
<td>300 (100.00)</td>
</tr>
</tbody>
</table>

Numbers in parentheses are percentages while those not in parentheses are the respondent counts


5.3 Innovative and Effective ways of managing children faecal matter in vulnerable communities in Cape Coast Metropolis.

To ascertain efforts made by MMDA’s in sanitizing the community, majority of the households representing 45.67% indicated that no effort had been made by the MMDA’s. This was followed by 21.00% for sanitation sanitization exercise, 13.67% for education, 13.00% for provision of sanitation equipment and 2% for law enforcement (5.5). The study shows that quite a number of efforts have been made by MMDA’s in sanitizing the Metropolis. This includes sanitation sanitization exercise, education provision of sanitation equipment and enforcement of law. This is what an assembly member of Cape Coast said:

“In trying to sanitize the metropolis, when you come to my community for instance, I do mobilize the people for clean-up exercise every month. In doing this, I make sure everybody partake in this exercise. Those who fail to comply are called to order and the necessary punishment is meted out to them. I also invite people from the health sector to come and educate my people of good sanity living. Anybody who is caught dumping refuse or faeces into drainages is punished” (Assemblyman for Abura).

“We have provided them with public containers and make sure the container is emptied when full. We also have a team (samansam) that goes round to inspect homes on sanitation. We arrest households with poor sanitation, take them to court for the law to
deal with them”. Response from metropolitan waste management officer” (Metropolitan Waste Management Officer).

Table 5.5: Efforts made by MMDA in sanitizing the community

<table>
<thead>
<tr>
<th>Effort made by MMDA</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanitation sensitization exercise</td>
<td>64</td>
<td>21.33</td>
</tr>
<tr>
<td>Education</td>
<td>41</td>
<td>13.67</td>
</tr>
<tr>
<td>Provision of sanitation equipment</td>
<td>39</td>
<td>13.00</td>
</tr>
<tr>
<td>Enforcement of sanitation laws</td>
<td>6</td>
<td>2.00</td>
</tr>
<tr>
<td>No effort</td>
<td>137</td>
<td>45.67</td>
</tr>
<tr>
<td>No Response</td>
<td>13</td>
<td>4.33</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>300</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>


Plate 5.1: A poster showing house to house sensitization on refuse disposal and hand washing.

The poster above shows an education program by the Metropolitan Health directorate on how and where to dispose refuse, and also how and why the need to wash your hand.

With regards to improvement in infrastructure services, more households representing 58.00% said there had not been improvement in infrastructure while 41.7% households attested that there had been improvement (Fig 5.2)
In identifying infrastructural services provided, water supply provision was high and accounted for 51.20%. This was followed by waste dump site and toilet facility provision which accounted for 28.00% and 20.80% respectively (Table 5.6).

**Table 5.6: Infrastructure services provided / improved in Cape Coast Metropolis**

<table>
<thead>
<tr>
<th>Infrastructure services</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water supply</td>
<td>64</td>
<td>51.20</td>
</tr>
<tr>
<td>Toilet facility</td>
<td>26</td>
<td>20.80</td>
</tr>
<tr>
<td>Waste dump site</td>
<td>35</td>
<td>28.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>125</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>

Figure 5.3: Households perception on behaviour change as a way to improve children’s faecal disposal in Cape Coast Metropolis


Figure 5.3 presents households’ perception on behaviour change as a way to improve children’s faecal disposal. It was indicated by majority, 296 (98.67%) of households that behavioural change can help improve children’s faecal disposal while only 4 household’s indicated no. Change in behavior can help improve children’s faecal matter disposal. A study in Nigeria shows that change in household behavior from child defecating on the floor, throwing child’s faeces into dumps to the child using chamber pot and it being disposed into latrines resulted in hygienic improved faecal disposal (Jinadu et al., 2007). From the study, most households attested that change in individual’s behavior can help improve children’s faecal matter disposal in the Metropolis. This is what a respondent had to say;

“We are part of the problem, and it all bores down to our attitudes and behavior. Even though, we have been receiving education from several sources, people seem to be ignorant and still hold on to the old ways of doing things. Some people remove their children’s diapers and dump it anywhere, others allow their children to defecate anywhere, throw faeces into open space and think it is normal. I believe if people in this community are to change their behavior from the normal way of doing things, child faeces disposal practiced will improve” (Respondent of FDG, Amamoma).
This also conforms to a concern from one assemblyman during an interview. And this is what he said:

“On the issue of sanitation especially with regards to children’s faecal matter disposal, until households change their perception and behavior, it will continue to be a challenge in this metropolis. Most adults are of the view that children’s faeces are not harmful and therefore handle it anyhow. My team and I do organize community education every three months and we are hoping for the best.” (Assemblyman for Cape Coast).

Table 5.7: Public information/education on proper child’s faecal disposal

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper communication of public information/education on proper child’s faecal disposal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>268</td>
<td>89.33</td>
</tr>
<tr>
<td>No</td>
<td>32</td>
<td>10.67</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>100.00</td>
</tr>
</tbody>
</table>

If No, how do you think it can be best be done?

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistency</td>
<td>12</td>
<td>37.50</td>
</tr>
<tr>
<td>Activeness</td>
<td>6</td>
<td>18.75</td>
</tr>
<tr>
<td>House to house education</td>
<td>9</td>
<td>28.13</td>
</tr>
<tr>
<td>No Response</td>
<td>5</td>
<td>15.63</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>100.00</td>
</tr>
</tbody>
</table>


With regards to public information and education on proper child faecal disposal, out of the 300 households, a number of households representing 89.33% indicated that there has been public information education on proper child faecal disposal (Table 5.7).

Do you think a lot has been done in addressing sanitation, water, toilet facilities by the district/sub-district assembly?
As to whether a lot has been done by the district/sub district assembly in addressing sanitation and facilities in the Metropolis, a majority, (201) of the households indicated that there had not been much effort by the district assembly in addressing the issue as compared to households who indicated much efforts (96) (Fig5.4). Even though some efforts have been made by the district Assembly in addressing sanitation problem in the Metropolis, most households reported that not much has been done and the assembly needs to improve on their efforts. In addressing the problem, it was suggested by households that more education has to take place, as well as enforcement of law and behavioral change to help improve sanitation in the Metropolis. Similar concerns were raised by most members during the focus group discussion. Below are some comments from respondents;

![Figure 5.4: Respondents’ perception on efforts taken in addressing sanitation problems by the district/sub-district assembly](http://ugspace.ug.edu.gh)

I think the assembly is doing quite well but I suggest there should be more education. They need to sit down and have one to one education with the people by outlining dangers bad sanitation would have on their health and some basic things they need to know as far as sanitation is concerned. Also anybody who violates the law should be given the appropriate punishment (Respondent 3 of FDG, Amamoma).

I would say education is good, but aside education, the assembly needs to strengthen their law enforcement. There should not be any form of favoritism, when someone violates the law, they need to call the person to order and deal with the issue according to the law. This will go a long way to change the behavior of the people (Respondent 4 of FDG, Abura)

Table 5.8: Respondents’ perception on addressing sanitation problems (Improper disposal of children’s faeces).

<table>
<thead>
<tr>
<th>Solutions to the problems</th>
<th>Frequency (N)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>More education</td>
<td>175</td>
<td>58.33</td>
</tr>
<tr>
<td>Law enforcement</td>
<td>40</td>
<td>13.33</td>
</tr>
<tr>
<td>Behavioural change</td>
<td>63</td>
<td>21.00</td>
</tr>
<tr>
<td>Others</td>
<td>22</td>
<td>7.33</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>100.00</td>
</tr>
</tbody>
</table>


From table 5.8, households’ views were soughted on ways to address sanitation challenges in the Metropolis (children’s faecal matter disposal). Most respondents constituting 58.33% indicated education as a way of addressing sanitation problems while 21.00% and 13.33% indicated behavioral change and law enforcement respectively.
CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1. Summary

The main objective of the study was to assess the disposal of children’s faecal matter and its influence on cholera outbreak in Cape Coast Metropolis. A mixed method approach was used in this study. A multi-stage sampling technique was used to select the sample for the study. The sample size of the study was 300 respondents for quantitative survey, 10 respondents for interview and a group of three consisting of 21 respondents for the focus group discussion. Data was collected by using self-administered questionnaire, in-depth interview, focused group discussion and observation. Primary and secondary data was collected from respondents. The Statistical Product and Service Solutions (SPSS version 21) was used to analyse the data. The data was analysed using simple frequency, percentages, chi square and logistic regression.

6.1.1. Key Findings

1. From the study, improved sanitation was found to be high, in high (94.00%) and middle (79.00%) income communities of the Metropolis. With regards to low income communities, unimproved sanitation was on high which accounted for 60.00%.

2. The majority of households (85.3%) in Cape Coast Metropolis practiced safe children’s faecal matter disposal.

3. It was also indicated that most households (51.7%) in Cape Coast Metropolis did not have toilet facility in their house which makes them resort to other means of convenience.

4. The results also found significant relationship between unsafe methods of children’s faecal matter disposal and households without toilet facility, as well as low income households.
5. The study revealed no significant relationship between cholera contraction and methods of children’s faecal matter disposal. However, households with unsafe children’s faecal matter disposal were found to be at high risk of getting cholera, but this was not significant.

6. A significant relationship existed between food bought outside, income and cholera contraction. Households who bought food outside as well as low income earners were at higher risk to get cholera.

7. Finally the study revealed that, behavioral change, education and strict law enforcement could help improve sanitation problems such as unsafe disposal of children’s faecal matter in the Metropolis.

6.2 Conclusions

It can be established that, communities in high and middle income zones have improved sanitation while communities in low income zones have unimproved sanitation. This is evident in earlier studies by WHO&UNICEF (2017), World Bank (2007) and Boadi (2008). Also, most households in the Metropolis lacked toilet facility and had to resort to other means. This was mostly found in middle and low income communities. This was in line with studies by UN Habitat (2003) and Awere et al (2013). Lack of toilet facilities in most households, as well as low income generation has led to unsafe disposal of children’s faeces in the Cape Coast Metropolis.

Furthermore, methods of children’s faecal matter disposal had no significant relationship with spread of cholera. This contradicts previous studies by Sahey et al (2015), Curtis et al (2011) and Aulia et al (2004). But rather, an important problem is that households who bought food outside as well as low income earners were at higher risk of getting cholera. This was evident in studies by Dexit (2010) and Dzotsi (2014). Lastly, household attitudes towards children’s
faecal matter disposal plays a major role in the management of children’s faeces as indicated in early studies by Jinadu et al (2007). Households in Cape Coast Metropolis will continue to be insecure if their way of doing things (behavior) does not change. This then will always make them prone to diseases such as cholera.

6.3 Recommendations

Based on the findings, the following recommendations are made by the study for consideration.

1. Since the study revealed unimproved sanitation to be high in low income communities of the Metropolis, it is therefore recommended that government institutions such as EHS Department, Waste Management Department and stakeholders ensure that sanitation laws are being enforced on households to curb the issue of unimproved sanitation. This can be done by strengthening the Town Council (Nsamansaman) on their regular checkups as far as sanitation is concerned and organizing regular clean up exercise in such areas of the Metropolis.

2. It was also discovered that, majority of households in the Metropolis practiced safe child faecal matter disposal. It is recommended that, continual and constant education by MOH, EHS, WMD be given to such household’s to serve as a checkup and reminder for maintaining sanitary children’s faecal disposal. With regards to households with unsafe children’s faecal disposal, more education together with strict law enforcement should be adhered to prevent them from mishandling children’s faeces.

3. The study also revealed that most households in the Metropolis lacked toilet facilities in their house, it is therefore recommended that the GAMA toilet project in the Greater Accra by the government be introduced in Cape Coast Metropolis to help households have their own toilets in order to prevent them from polluting the environment with faeces. Also, public toilets should be kept clean, and in doing this, the assembly members should ensure that there is constant cleaning of the place.
4. It was also observed that factors such as unavailability of toilet facility in households and low income led to unsafe children’s faeces disposal. It is therefore recommended that public toilets be situated at vantage points where households can have easy access and the cost of usage be made favourable to the less privileged persons.

5. Households with unsafe children’s faeces disposal should be made to understand the consequences of mismanaging children’s faeces and its role in spreading cholera. This can be done by giving training to such households to improve their way of living as well as acquire new and better ways of handling children’s faeces.

6. The study also indicated that eating food sold outside the home and income influenced the spread of cholera, so it is recommended that, Food and Drugs Authority together with Standards Board ensure that food vendors get the necessary permit before selling any food. And there should be a constant check up on food vendors concerning containers for selling food, environment in which food is sold and personal hygiene of the vendor.

7. With regards to behavioral change to improve children’s faecal matter disposal, which the study identified, it is recommended that more sensitization programs be carried out by the assembly and government institutions through one on one education, house to house education and community education on when, how and where to dispose child faeces. There should also be strict enforcement of the law to ensure households handle children’s faeces during and after the child defecates.

8. In terms of policy making, a clear-cut policy regarding management of children’s faecal matter for households should be set up by Government in collaboration with sanitation and health organizations to deter households from mismanaging children’s faeces.
9. Lastly, future research can comparatively examine children’s faecal disposal practice among males and females to know which gender group practices safe and unsafe disposal and the reason behind their actions. Also, the role of government and stakeholders in managing children’s faecal matter should be examined.
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APPENDIX A: HOUSEHOLD QUESTIONNAIRE

UNIVERSITY OF GHANA
COLLEGE OF HUMANITIES
SCHOOL OF SOCIAL SCIENCES
DEPARTMENT OF GEOGRAPHY AND RESOURCE DEVELOPMENT

HOUSEHOLD QUESTIONNAIRE FOR RESEARCH ON MANAGEMENT OF CHILDREN’S FAecal MATTER AND ITS IMPLICATIONS FOR CHOLERA OUTBREAK IN THE CAPE COAST METROPOLIS

Dear Respondent,

This research is intended to assess the disposal of children’s faecal matter and its influence/effects on cholera outbreak in the Cape Coast Metropolis. Your answers to the questions below will help shape my understanding of children’s faecal management and cholera incidence, and also assist in recommending appropriate innovative and effective interventions for managing children’s faecal matter in vulnerable communities in the Cape Coast Metropolis. You are assured that any information you provide will be treated as confidential.

NAME OF COMMUNITY: …………………..

SECTION A
Socio-Demographical Profile

1. Sex:
   a) Male [ ]
   b) Female [ ]

2. Age:
   ………………………..

3. Marital Status:
   a) Single and never been married [ ]
   b) Married [ ]
   c) Divorced/Separated [ ]
   d) Widowed [ ]

4. Level of Education:
   a) No formal education [ ]
   b) Basic [ ]
   c) Secondary/Technical/Vocational [ ]
   d) Tertiary [ ]

5. Religion:
   a) Christianity [ ]
   b) Islam [ ]

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6. Occupation:
   a) Trading [ ]
   b) Civil Servant [ ]
   c) Craftsmen/Artisans [ ]
   d) Other (Specify)…………………………

7. Local/mother language: ...........................................................

8. Where do you come from? (Hometown) ......................... ....................

9. How long have you lived in this town?
   c) Born here (since birth) [ ]
   d) 1-5 years [ ]
   e) 6-10 years [ ]
   f) 11-15 years [ ]
   g) 16 years and above [ ]

10. What type of material was used in building the house in which you live in?
    a) Mud/clay house [ ]
    b) wooden house [ ]
    c) cement block [ ]
    d) Sand Crete [ ]
    e) Other
       (Such as kiosk, container, tent, etc)

11. What is the number of people in your house? ..................

12. What is the size of your household? ..............................

13. What is the structure of your family?
    a) Nuclear [ ]
    b) Extended [ ]

14. Number of Children/dependants? .........................

15. Number of children/dependants under 5 years? ..................

16. Age(s) of children under 5 years? ...............................

17. Approximately, what income do you earn in a month?
    a) Less than 100.00 [ ]
SECTION B
Current State of Sanitation

Waste Disposal Methods
18. How do you rate sanitation situation in your community?
   a) Very Good [ ]  b) Good [ ]  c) Bad [ ]  d) Very Bad [ ]

19. What is your reason for the option you chose for 18?
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………
   ……………………………………………………………………………………………

20. How do you store waste in your household?
   a) Polythene bags [ ]  b) Plastic Containers with lid [ ]  c) Buckets, boxes or basket [ ]
   d) other (specify) ………………………

21. Where do you dispose the waste after storage?
   a) Open Dumps [ ]  b) Open Drainages [ ]  c) Public Containers [ ]
   d) Burnt [ ]  e) Other (specify) ……………………

22. If public container, how far is it from your house?
   a) Less than 50metres [ ]  b) about 50metres [ ]  c) about 100metres [ ]
   d) about 150metres [ ]  e) other (specify) ……………………

23. How long does it take you to get to the disposal point/public container? Indicate the
    appropriate minutes/hours. …………………………………

24. Who is responsible for waste collection in your community?
   a) Public sector – CCMA [ ]  b) Private [ ], Specify …………

25. What is the frequency of waste collection in your community?
   a) Daily [ ]  b) Twice a week [ ]  c) Three times a week [ ]  d) Once a month [ ]
   e) other, specify………

26. How much do you pay monthly for waste disposal? ………………………

27. How do you find the cost?
   a) Low [ ]  b) average [ ]  c) High [ ]  d) Very High[ ]
28. How much are you prepared to pay for waste? .................................

29. Do you think it is necessary to pay for waste?
   a) Yes [      ]  b) No[     ]

30. Explain your choice of answer for Q. 29. .................................

SECTION C
Methods of Children’s Faecal Matter Disposal

31. Where do you dispose your child’s faeces?
   a) Latrines [     ]  b) Buried [     ]  c) Thrown into dumps [     ]  d) Drainages [     ]
   e) other, specify ...................

32. What is being done to the faeces before disposing it (storage)? .........................

33. How long do you store faeces before disposal?

34. Approximately, how many times does your child defecate within a day?
   a) Once [     ]  b) Twice [     ]  c) Three times [     ]  d) Four and above[     ]

35. Do you have toilet facility in your house?  a) Yes [    ]  b) No [     ]

36. If No, where do you use as a place of convenience?  a) Public Toilet [     ]  b) beaches [     ]  c) Open drains [     ]  d) other, specify ...................

37. What informs your decision to dispose your child faeces at the dump site?
   a) Lack of toilet facility [     ]  b) Distance covered to access latrine [     ]  c) cost of accessing latrines [     ]  d) Other, Specify.............

38. In what materials or containers do your child defecate?
   a) Potty [     ]  b) Diapers [     ]  c) Napkins [     ]  d) on the ground [     ]  e) other, specify ...................

SECTION D
Knowledge of Caregivers on Child Faecal Matter and Hygiene

39. Are you aware that child faeces is harmful?
   a) Yes [     ]  b) No [     ]  c) No idea[     ]

40. What sanitary way do you think children’s faeces can be handled after defecation?
.......................................................................................................................................................
.......................................................................................................................................................

41. Do you think it is necessary to wash the hands after handling your child’s faeces?
   a) Yes [     ]  b) No[     ]
42. Give reason for the option chosen for question Q. 38………………………………

43. If yes to question 38, what detergent do you use to wash your hands?
………………………………………………………………………………

44. What detergents do you use to wash the faecal equipment after use?
………………………………………………………………………………

45. How long does it take to dispose of your child’s faeces after defecation?
   a) Right after defecation [       ]   b) 5 to 10 minutes time [       ]   c) More than 10 minutes[       ]

SECTION E
Vulnerability of Residents to the Spread of Cholera
(Experience and Knowledge on Cholera)

46. Have you heard of cholera? a) Yes [       ] b) No[       ]

47. If yes, which medium did you hear or see it from?
   a. Radio [       ] b) TV [       ] c) Local Announcement [       ] d) Friend/Family [       ] e) other……………………………………

48. What is the root cause of cholera? a) Eating contaminated food [       ]
   b. Drinking contaminated water [       ] c) other ………………………………

49. Have you or any of your household been infected with cholera in the last 5 years? a) Yes[       ] b) No[       ]

50. If yes, how did you/he/she/ contract it? ………………………………………………………

51. What is the principal source of drinking water in your household? a) Sachet water [       ]
   b) Pipe borne water [       ] c) bottled water [       ] d) other specify ………

52. Do you and/or your household often buy roadside foods? a) Yes b) No

53. If yes, how often? …………………………………………………

54. Do you inform/teach your family about personal hygiene? a) Yes [       ] b) No [       ]

55. Are there public clean up exercises in your community? a) Yes [       ] b) No [       ]
56. Do you participate in public clean up exercises in your community?  
a) Yes [   ]  
b) No [       ].

57. Give a reason to it …………………………………………………………………………………

58. Are there any sanctions when people refuse to participate in clean up exercises?  
a) Yes [   ]  
b) No [       ].

59. Are you timely educated and warned about cholera?   
a) Yes [   ]  
b) No. [       ] .

60. If yes, when was the last time? a) Less than a week [   ]  
b) Always [       ]  
c) Less than 3 month [  ]  
d) 6 month ago [  ]  
e) 1 year ago  
f) above a year [   ].

**Education on Cholera**

61. Which institutions are available for cholera awareness creation? …………………

Please tick the appropriate institution if available.

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<th>Disagree</th>
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<td>NADMO</td>
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<td>Environmental NGO’s</td>
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<td>Social Groups</td>
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<td>MMDAs</td>
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SECTION F
Innovative and Effective Ways of Managing Children Faecal Matter against Cholera

68. What has been the MMDA’s effort in sanitizing the community?
……………………………………………………………………………………………………
……………………………………………………………………………………………………

69. Has there been improvement in infrastructure services such as water supply/toilet facility/waste dumps site etc. services within the community?
a) Yes [ ]  b) No [ ]

70. If yes, which of them? ………………………………………………………………………

71. Has there been improvement in environmental conditions in the community over the years?  a) Yes [ ]  b) No [ ]

72. If Yes, which of these services?  a) Water [ ]  b) Solid waste collection [ ]  c) Toilet [ ]  d) Sullage and drainage [ ]  e) Other Specify……

73. How effective are communication systems for easy relay of information on child faecal management and other problems facing community? ………………………

74. Do you think behavioural change can help improve children’s faecal disposal?
a) Yes [ ]  b) No [ ]

75. Do you think public information/education on proper child faecal disposal are well Communicated, hence can help prevent cholera?  a) Yes [ ]  b) No [ ]

76. If No, how do you think it can best be done? …………………………………………

77. Do you think a lot has been done in addressing sanitation, water, toilet facilities by the district/sub-district assembly?  a) Yes [ ]  b) No [ ]

78. In your view, what do you think should be done to address these challenges?
……………………………………………………………………………………………………

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APPENDIX B: INSTITUTION INTERVIEW GUIDE

INSTITUTION INDEPTH INTERVIEW

ASSEMBLY MEMBERS

1. Sex
2. Age
3. Religion
4. Level of Education
5. Marital Status
6. Role of Respondent in the community
7. How long have you served as assemblyman/women in your electoral area?
8. How do you rate sanitation in your locality?
9. Does the community have adequate toilet facilities?
10. Is there open defecation, and what are some of the reasons behind open defecation along the beaches and other indiscriminate places?
11. How is children’s faeces being disposed in your locality?
12. Does your community experience cholera incidences?
13. What do you think is the root cause of cholera outbreak in your locality?
14. Do you play any special role in preventing cholera?
15. What do you/community members do to reduce or prevent cholera and other risk factors?
16. How prepared is your organisation to mitigate cholera epidemics in the community?
17. What are the challenges you (individual and organisation) face in the discharge of your duties in faecal disposal and cholera prevention?
APPENDIX C: INSTITUTION INTERVIEW GUIDE

INSTITUTION INDEPTH INTERVIEW

HEALTH DIRECTORIATE

1. Sex
2. Age
3. Religion
4. Level of Education
5. Marital Status
6. Role of Respondent
7. How do you describe the socio-environmental conditions in this Metropolis? Especially, appropriate toilet provisions.
8. What has been the trend of cholera in the Cape Coast Metropolis?
9. Is there a cholera risk reduction framework for effective mitigation?
10. What measures are put in place before, during and after a cholera epidemic?
11. What are the challenges faced in the execution of these measures?
12. Which state actors or community structures do you collaborate with in preventing cholera within the community?
13. Are there plans in place to increase sanitation facilities within the community?
14. What is being done by your outfit to reduce or prevent cholera in the community?
15. What is being done to eliminate risk factors which cause cholera in the community?
16. What are the challenges encountered in cholera prevention as well as the alternative solutions?
17. What are the shortfalls of your institution in fighting cholera and underlying risk factors (management of faecal matter)?
APPENDIX D: INSTITUTION INTERVIEW GUIDE

INSTITUTION INDETH INTERVIEW

NADMO (Monitoring and Control factors)

1. Sex
2. Age
3. Religion
4. Level of Education
5. Marital Status
6. Role of Respondent
7. What is the main responsibility of your organization in cholera prevention and response?
8. How do you assess “accessibility and adequacy” of toilet facility provision in Cape Coast Metropolis?
9. How do you access children faecal disposal practices by households in this area?
10. What has been the reason for frequent cholera outbreak within the community?
11. What is the role of NADMO in managing cholera?
12. Is there cholera risk reduction and response framework for effective mitigation?
13. What measures are in place before, during and after cholera outbreak within the Metropolis?
14. What are the challenges faced in cholera mitigation?
15. How do you assess the performance of your organization in mitigating cholera?
16. What are the shortfalls by your institution in fighting cholera and underlying risk factors?
APPENDIX E: INSTITUTION INTERVIEW GUIDE

INSTITUTION INDETH INTERVIEW

MMDAs

1. Sex
2. Age
3. Religion
4. Level of Education
5. Marital Status
6. Role of Respondent
7. How will you describe sanitation conditions in Cape Coast Metropolis?
8. What are the factors that account for poor sanitation in this Metropolis?
9. What role do you play to ensure that wastes are not dumped indiscriminately within your Metropolis as well as keeping proper sanitary condition?
10. Does the community have adequate toilet facilities?
11. What are some of the reasons behind open defecation along beaches and other indiscriminate places?
12. What are some of the challenges faced by your organization in ensuring proper waste disposal and proper sanitary conditions?