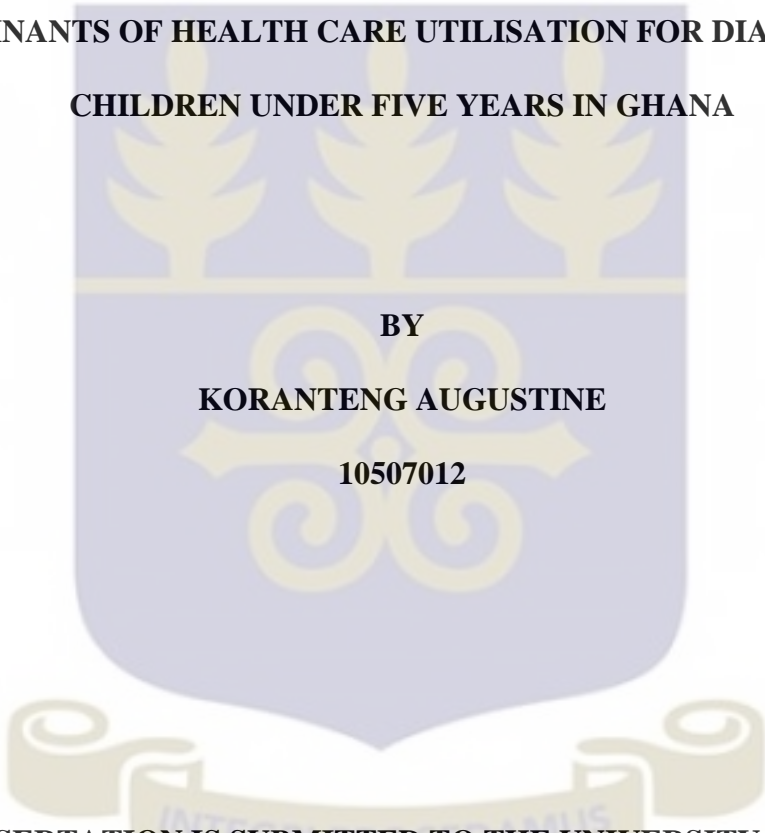


**SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA**

**DETERMINANTS OF HEALTH CARE UTILISATION FOR DIARRHOEA IN
CHILDREN UNDER FIVE YEARS IN GHANA**

The background of the central text area features a large, light-colored watermark of the University of Ghana crest. The crest is a shield-shaped emblem with a blue field. The top section contains three golden wheat stalks. The bottom section contains a golden cross with four curved ends. Below the shield is a golden ribbon with the Latin motto 'IN DEO VERITAS' written on it.

**BY
KORANTENG AUGUSTINE
10507012**

**THIS DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA,
LEGON IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE
AWARD OF MASTER OF PUBLIC HEALTH DEGREE**

JULY, 2015

DECLARATION

I hereby declare that with the exception of articles and books which have been quoted, cited and duly acknowledged in the references of this project, all other information produced from this project is the result of my original research. No part of it has been presented for another degree in this university or elsewhere.

.....
KORANTENG AUGUSTINE
(STUDENT)

.....
DATE

.....
PROF. MOSES AIKINS
(SUPERVISOR)

.....
DATE



DEDICATION

This work is dedicated to my Father Hon. Yaw Effah-Baafi and wife, as well as my Mother Yaa Kwantemaa and the entire family for all the sacrifices they made for me to become who I am today.



ACKNOWLEDGEMENT

My first gratitude goes to the Almighty God for His continual blessings and favour upon my life throughout this course. God I thank you so much for what you have done.

I wish to express my sincere appreciation to my supervisor **Prof. Moses Aikins** who painstakingly perused my work to bring out the best in me. Thank you for your insight and guidance.

I also wish to acknowledge the inputs and technical advice of Dr. Justice Novingnon, Dr. Genevieve Cecilia Aryeetey and Dr. Reuben Esena all of the School of Public Health. My special thanks goes to Dr. Fosu Gyabaah and Henry Ofosu Addo whose invaluable advice set this study on course.

I am also highly appreciative of the support of all my family members, especially Adu Paul, Martin Adomako, Atta, Junior, Annor, Augustina, Serwaa, Nyarko, Owusuaa, Olivia, Evelyn, Florence and Gloria.

My heartfelt thanks goes to the kindness and generosity of every individual who helped to make this work a reality.

ABSTRACT

Background

Diarrhoea in children under five years has become a major public health concern world-wide. It is possible that diarrhoea will remain a leading cause of child mortality world-wide in the future. World Health Organisation has indicated that children under five years are vulnerable to diarrhoeal disease especially Sub-Saharan Africa, it is therefore important for a study to be conducted to examine factors influencing health care utilisation in children under five years with diarrhoea in Ghana.

Methods

The data employed in this study was drawn from Demographic and Health Survey. It was a household-based survey conducted in Ghana by Ghana Statistical Service and the Ghana Health Service. The survey was conducted in 2008 and collected data on demographic and health indicators such as fertility, contraceptive prevalence, nutritional status, infant and child mortality and anaemia prevalence. The study population covered all the children under-five years who were part of the 2008 GDHS with a household sample of more than 12,360. Multinomial probit model was used in this study with four health care options: public, private, over-the-counter and no-treatment. Pearson's chi-squared test was used to test for a significant association between socio-economic status and health care utilisation.

Results

Mother's education showed as social factor influencing health care utilisation. Mothers who had middle/JHS and secondary education are more likely (0.580) to use health facility for treatment than those who had primary education. Socio-economic status was found in the study as a factor influencing care utilization. The study also showed that households in the richer and richest socio-economic status prefer to use private health facilities than not to have any treatment at all as compared to the households in the poorest socio-economic status. Toilet facility used by the households also proved as a determinant of health care utilization in children under five with diarrhoea.

Conclusion

Improvement in the socio-economic status of the poorest households in the country can help to improve the use of public and private health facilities in order to reduce the mortality of children under five years with diarrhoea in Ghana. Therefore, it is important for the Ministry of Health to take into consideration when planning about children under five in order to reduce child mortality.

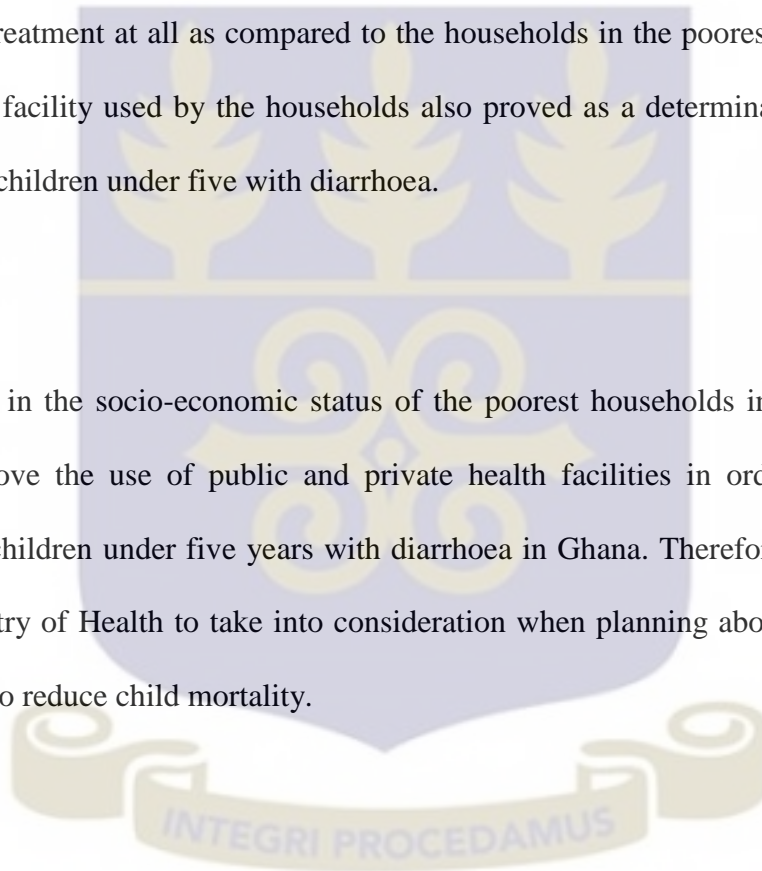


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LIST OF ABBREVIATIONS

| | |
|--------|--|
| CHPS | Community-based Health Planning and Services |
| DHS | District Health Service |
| DHSs | District Health Services |
| EAs | Enumeration Areas |
| GDHS | Ghana Demographic and Health Survey |
| HCFs | Health Care Facilities |
| HCU | Health Care Utilisation |
| MDG | Millennium Development Goal |
| OTC | Over- the- counter |
| SSA | Sub – Saharan Africa |
| UNICEF | United Nations International Children’s Emergency Fund |
| WASH | Water Sanitation and Hygiene |
| WHO | World Health Organisation |



CHAPTER ONE

INTRODUCTION

1.1 Background

Diarrhoea is an increase in volume of stool or frequency of defecation. Diarrhoea affects people of all ages, and it is characterized by loose and watery stools occurring more than three times in a day (Mwambete & Joseph, 2010). An estimated 884 million people worldwide lack access to improved water sources. Lack of access to safe drinking water, together with inadequate sanitation and hygiene, has been identified to be the main contributor to diarrhoea infection and deaths globally. Where safe water infrastructure is lacking, especially in rural areas of developing countries, drinking contaminated water is an important cause of diarrhoea (Mashoto et al., 2014).

According to the World Health Organization (WHO) and UNICEF, there are about 2 billion cases of diarrhoeal disease worldwide every year, and 1.9 million children younger than 5 years of age perish from diarrhoea each year, mostly in developing countries. This amounts to 18% of all the deaths of children under the age of five and means that more than 5000 children are dying every day as a result of diarrhoeal diseases. Of all child deaths from diarrhoea, 78% occur in the African and South-East Asian regions (Farthing et al., 2012). According to Ghana Demographic and Health Survey (2008), dehydration caused by severe diarrhoea is a major cause of morbidity and mortality among young children in Ghana, although the condition can be easily treated with oral rehydration therapy (GSS et al., 2009).

Rahman et al., (2014) indicated that, diarrhoeal diseases can be classified according to their clinical pattern as: (i) persistent diarrhoea (i.e. diarrhoea lasting 14 days or more); (ii)

acute watery diarrhoea (i.e. diarrhoea without blood lasting less than 14 days); or (iii) acute bloody diarrhoea (i.e. diarrhoea with blood lasting less than 14 days). It is possible that diarrhoea will remain a leading cause of child mortality worldwide in the future. Some of the most challenging global issues, such as nutrition, environmental pollution, population increase and climate change are not only related to each other but also have the potential to contribute to living conditions associated with a high risk of diarrhoea (Schmidt et al., 2010).

Poor sanitation, lack of access to clean water supply and inadequate personal hygiene are responsible for 90% of diarrhoeal disease occurrence, these can be easily improved by health promotion and education (Gebru et al., 2014). Diarrhoea prevalence increases with age and peaks at 12-23 months (33%), then declines at older ages. Age 12-23 months is when children start to walk and are at increased risk of contamination from the environment (GSS et al, 2009).

Child health is a major public health and development challenge in Ghana. After being static for close to two decades, the 2008 GDHS showed a 30% reduction in the under-five mortality rate. This achievement sets Ghana in a positive direction to reaching the Millennium Development Goal (MDG) of reducing under-five mortality rate to 40/1000 live births by 2015. Although some progress has been made, there are several challenges still to be addressed with regard to child survival and development. Under 5 mortality in Ghana remains high (111/1000 live births in 2001-2006). Declines in mortality that began in the 1980's have slowed. Between 1984 and 1998 child mortality declined by 43/1000 live births. Between 1999 and 2006 child mortality remained static (MOH, 2007-2015).

Diarrhoeal disease can not only be managed by the Ghana Health Service and the various hospitals in the country. The problem of diarrhoea associated with availability of clear water, latrines, waste water disposal, hand washing habits, level of education is also associated with economic level and health care utilisation. Since statistics from WHO has indicated that children under five years are vulnerable to diarrhoeal disease especially Sub-Saharan Africa, it is therefore important for a study to be conducted to identify where parents take their children to receive treatment for diarrhoea in Ghana.

1.2 Problem statement

In Ghana, children under five years are vulnerable to diarrhoea (Mihrete et al., 2014). Access to facilities remains a problem. Medical facilities are not evenly distributed across the country, with most rural areas lacking basic facilities such as hospitals and clinics as well as doctors and nurses. Ghanaians on average live about 16 km from a healthcare facility where they can consult a doctor, but half of the population live within a 5 km radius. Other half cannot consult a doctor within 5 km, which corresponds to a 1 hour walking distance, and one quarter even lives more than 5 km from a facility where a doctor can be consulted (Salifu & Vannessa, 2009) .

Levels of mortality in African children are unacceptably high. Access to medical care is a key determinant of health and one that can be addressed (Ansah et al., 2009). Ansah, (2009) indicated that, considerable efforts have been made to identify the barriers to accessing health care with the effort of increasing rapid access to health care in the public sector by those in need.

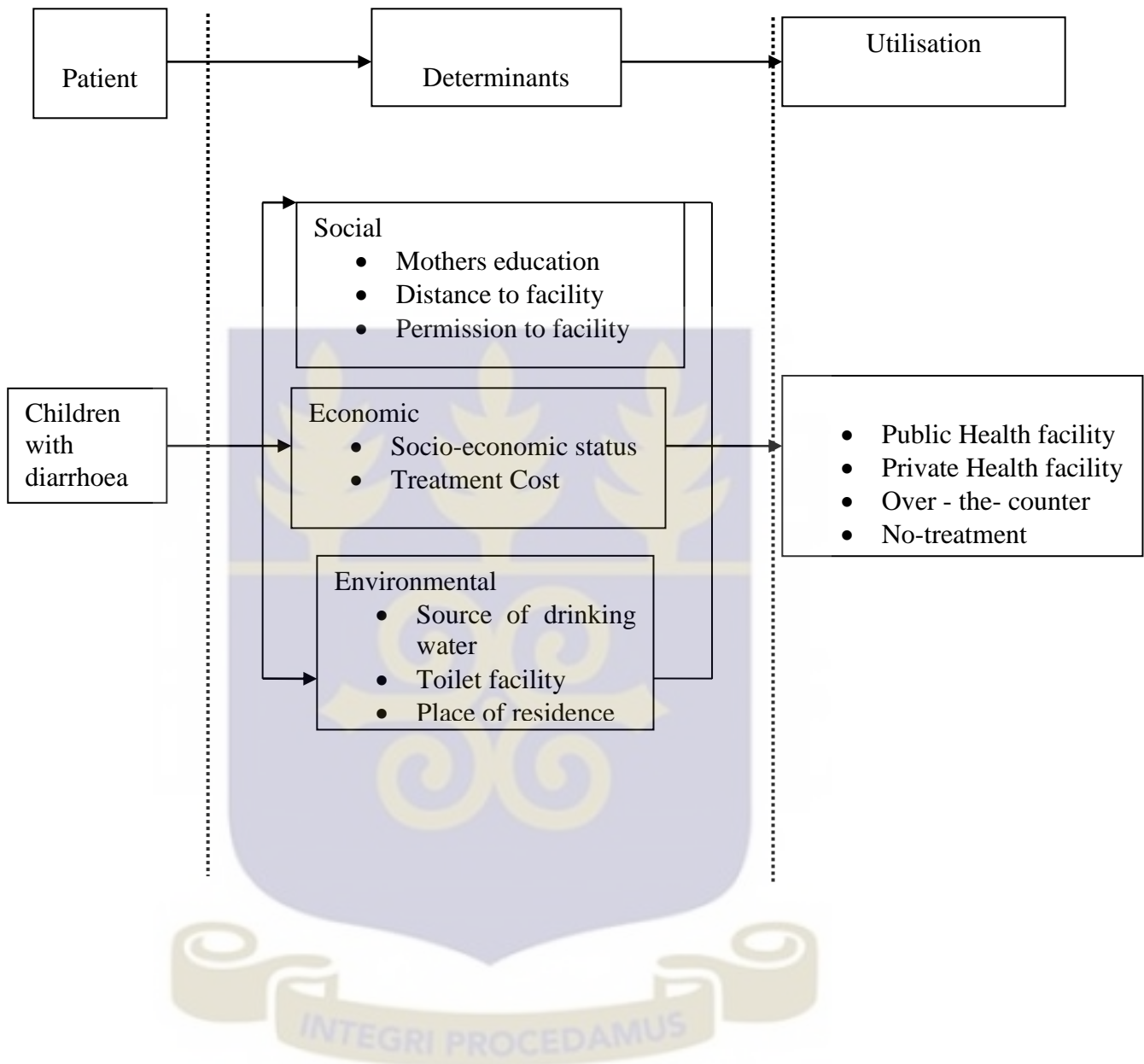
In Ghana, most people find it very difficult to access health care. Research has proven that, longer travel, waiting and treatment times at public and private facilities encourage people to resort to the use of self-medication or over-the-counter providers (Nonvignon et al., 2010). Considerable efforts have been made to identify the barriers to accessing health care with the aim of increasing rapid access to health care in the public sector by those in need. Potential barriers include: perceived quality of service, socio-cultural factors, availability of health services, distance and travel cost, and cost of services (Ansah et al., 2009).

The achievement of MDG by 2015 is a major concern to the people of Ghana. Under-five mortality as a result of diarrhoea is something that can also be prevented but there is the need to know the factors causing the death of children under-five years in Ghana. Therefore, the study examined factors influencing health care utilisation for diarrhoea in children under five years in order to meet our MDG target by 2015.

1.3 Conceptual framework

The framework considers factors that influence health care utilisation for diarrhoea in children under five years in Ghana. Social factors such as, distance, permission to go for treatment, mother's education are factors identified to influence health care utilisation. The economic factors which can also influence health care utilisation are socio-economic status and treatment cost. The study focused on the type of facility that children under five years with diarrhoea used, therefore, three of the health care facilities used were taken into consideration by the study. These were public health facility, private health facility and over – the – counter. No- treatment was also considered for parents who did nothing.

Figure 1: Framework for health care utilisation

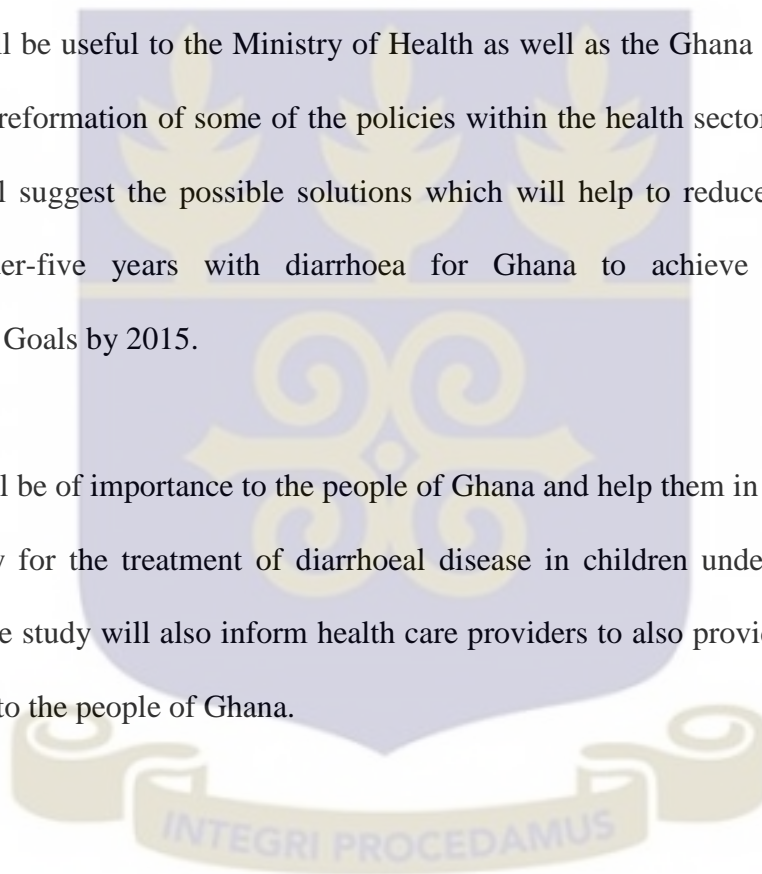


1.4 Justification

The study which sought to find the determinants of health care utilisation for diarrhoea in children under-five years will be of immense importance. The study will help to outline the factors that influence health care utilisation through a thorough literature review and suggest the best type of health facility to be utilised for treatment of diarrhoea in children under- five years.

The study will be useful to the Ministry of Health as well as the Ghana Health Service to contribute to reformation of some of the policies within the health sector. The findings of the study will suggest the possible solutions which will help to reduce the mortality of children under-five years with diarrhoea for Ghana to achieve the Millennium Development Goals by 2015.

The study will be of importance to the people of Ghana and help them in choosing the best health facility for the treatment of diarrhoeal disease in children under five years. The findings of the study will also inform health care providers to also provide the best health care services to the people of Ghana.



1.5 Objectives

1.5.1 General objective

The general objective of this study is to determine factors influencing health care utilisation in children under five years.

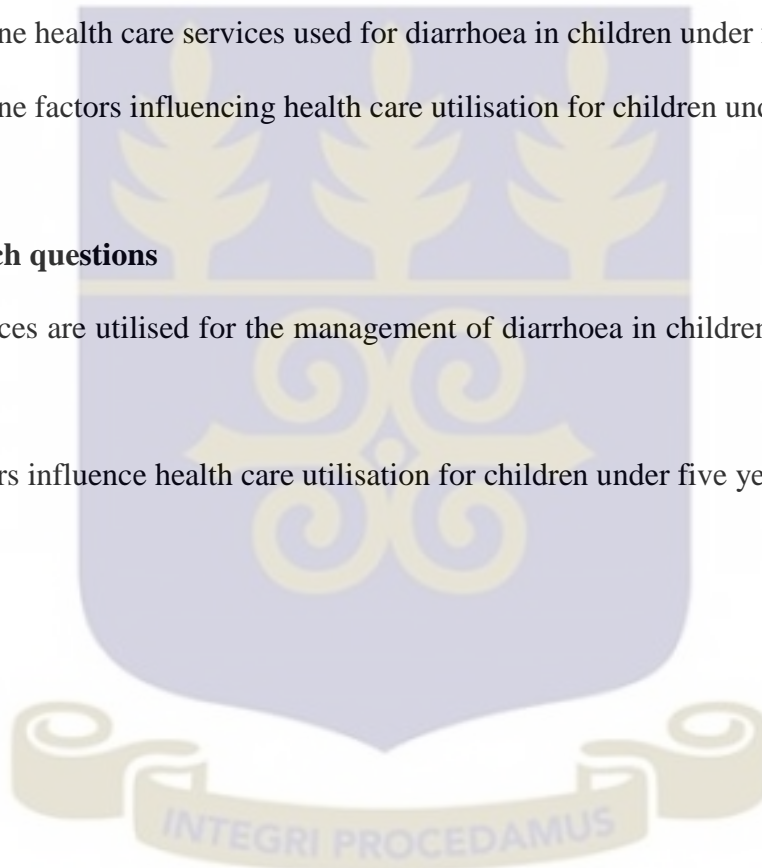
1.5.2 Specific objectives

The specific objectives were:

1. To determine health care services used for diarrhoea in children under five years.
2. To determine factors influencing health care utilisation for children under five years

1.5.3 Research questions

1. What services are utilised for the management of diarrhoea in children under five years in Ghana?
2. What factors influence health care utilisation for children under five years?



CHAPTER TWO

LITERATURE REVIEW

2.1 Diarrhoea

Diarrhoea is the second leading cause of death among children under five. Nearly one in five child deaths (about 1.5 billion each year) is due to diarrhoea (Chiabi et al., 2010). According to the World Health Organization (WHO) and UNICEF, there are about two billion cases of diarrhoeal disease worldwide every year, and 1.9 million children younger than 5 years of age die from diarrhoea each year, mostly in developing countries. Of all child deaths from diarrhoea, 78% occur in the African and South-East Asian regions (Farthing et al., 2012).

Diarrhoea mortality has declined steadily since the 1980s; diarrhoeal disease remains the third leading cause of death among children under-five globally. An estimated 800,000 under-five deaths were attributable to diarrhoea in 2010, accounting for 11% of all under-five deaths, with about 80% of these diarrhoeal deaths occurring in the African and Southeast Asian (Gaffey et al., 2013). It has been recognized that the adverse effects of diarrhoea such as malnutrition and death depend not so much on the number of diarrhoea episodes, but on the duration of these episodes as well as the number of days with diarrhoea over some period of time (Schmidt et al., 2009).

The variation in the level of diarrhoeal morbidity is well explained by maternal education, income, personal hygiene, refuse disposal system and the effect of health extension programme. Cognizant of this fact, they recommended that, the strategy of being model families and, behavioural change communication education emphasized on personal

hygiene lead to total sanitation should be strengthen to reduce the risk of childhood diarrhoea (Gebru et al., 2014).

The majority of diarrhoeal diseases can be prevented by implementing water, sanitation and hygiene (WASH) programmes, which all aim at interrupting faecal-oral transmission pathways, commonly referred to as the five “F” (fluids, fields, flies, fingers and food). Preventing diarrhoeal diseases and associated morbidity in children was shown to reduce levels of pupil absence in schools, while preventing long-term consequences such as malnutrition and stunting, which in turn detract from intellectual capacities and later economic status. To achieve sustainable progress in overcoming such unmet health needs, programme planning and implementation needs to be adjusted to the specific requirements and needs of a local setting (Diouf et al., 2014).

Diarrhoea has a worldwide distribution with high prevalence found in people with low socio-economic status and poor living conditions as well as people in over-crowded areas with poor environmental sanitation, improper garbage disposal, unsafe water supply and unhygienic personal habits. These factors are the causes of major proportion of the burden of disease and death in developing countries (Nkrumah & Nguah, 2011). A basic hygienic practice in the reduction of diarrhoea in developing countries is washing of hands (Addo et al., 2014).

A study in South Africa demonstrated that protozoan organisms, such as *E. histolytica*, *Cryptosporidium*, *Giardia* and *Cyclospora*, *Campylobacter* spp. are the most common bacterial causes of diarrhoea in developing countries (Samie et al., 2009). Most child deaths occur due to a small number of conditions that, even in the poorest settings, could

be mostly prevented with a small number of interventions that are well-known, feasible, affordable, and deliverable without complex technology (Boschi-Pinto et al., 2009).

It is critically important for anti-diarrhoeal agents to be readily available and attainable in rural communities of the developing world, in order to address the high morbidity and mortality among children and for families to be educated on standard methods of application (Njume & Goduka, 2012). A study done in Accra concluded that, socio-economic and environmental conditions are risk factors for urban diarrhoea mortalities (Fobil et al., 2012). A high burden of diarrhoea in early childhood may increase the risk for cognitive impairment later in life (Gjessing et al., 2012).

A study done in Brazil has proven that, rotavirus vaccination is an important tool for reducing the global burden of diarrhoea (Ikeda et al., 2011). Human faecal contamination on the hands of caregivers and in water is also a cause of high increase of diarrhoeal disease in developing countries (Mattioli et al., 2014). Diarrhoea incidence remains a tremendous burden on children in low and middle-income countries due to multiple determinants such as child malnutrition, low socio-economic status and education of mothers, lack of safe drinking water, inadequate sanitation and poor hygiene, crowding and low maternal age. These determinants of diarrhoeal disease are strongly linked to poverty and social inequities (Rina et al., 2013).

2.2 Health care utilisation

Health care utilisation is the use of health care services by people. The health care utilisation of a population is related to the availability, quality and cost of services, as well

as to social economic structure and personal characteristics of the users (Awoyemi, Obayelu, & Opaluwa, 2011).

The independent variables that were found to be determinants were maternal education, maternal occupation, type of toilet facility, child's stool disposal, and number of under five children, birth order, and age of child. A higher risk of diarrhoea was seen in children in a higher birth order and in households without improved toilet facilities. Mothers with some education protected their children against diarrhoea better than mothers with no education under poor environmental settings (Mihrete et al., 2014).

A community characteristic such as distance to the nearest health facility is an important factor influencing health care utilisation. Therefore, the bridging of health access through the establishment of Community-based Health Planning and Services (CHPS) zones throughout the country should be expedited to promote appropriate and timely health seeking among the populace (Nketiah-Amponsah, 2010). A study conducted in Ghana also showed that, wealth, education, number of living children, problems with transportation and residence (rural/urban) are important factors that influence health care utilisation (Arthur, 2012).

A study from Malawi showed higher likelihood of health care utilisation (HCU) for villages with access to public transport and another study from Pakistan reported that the availability of public transport as well as the frequency of the provided services is important to access remote Health Care Facilities (HCFs). It appears highly plausible that availability of transport plays an important role, but issues such as affordability also need to be considered (Krumkamp et al., 2013). Improving access to health care holds great

potential for the reduction of child death rates in Sub-Saharan Africa (SSA) (Rutherford et al., 2010).

A study conducted in Canada about Health care utilisation indicates that, most of the disparity in high health care utilisation, for low-income households is associated with higher disease prevalence, and not merely a difference in utilisation behaviour (Lemstra et al., 2009). A study also suggests that, income source, ownership of means of transport and health literacy were reported as centrally important in facilitating use of health care for the 'least poor' and 'medium' wealth categories. However, the lack of these was a barrier for the poorest wealth category. The 'poorest' wealth category were keen to utilise public health services which are provided free of charge (Bakeera et al., 2009).

A study done in Nepal showed that, wealth status, maternal occupation and paternal occupation were significantly associated with health care utilisation. Mothers from high socio-economic status family with higher education were more likely to utilise health care services. Likewise mothers with agriculture occupation were less likely to utilise health care services at (Khanal et al, 2014).

2.2.1 Access to health care

Access to health facilities in developing countries is an essential component in achieving the 4th Millennium Development Goal of decreasing infant mortality by two-thirds by 2015. Access and utilisation of health services is multi-faceted, influenced by cultural, behavioural and financial factors (Feikin et al., 2009). A key factor in the reduction of child mortality and the promotion of child health is universal accessibility of healthcare services, which is determined by many different factors including travel distance. A long

distance to health facilities has been shown to significantly reduce the use of health services by the population (Schoeps et al., 2011).

The degree of fit between the demand for and supply of health care often involves physical contact, we routinely think of access as a geographic problem of overcoming the friction of physical distance. Undoubtedly, proximity or physical distance is an essential aspect of any geographic understanding of access to health care, but we must note that distance, or the friction imposed by it, is not merely physical, but also sociocultural (Mensah, 2014). A study in Niger showed that, health centers and posts are the cornerstone of the health system, in particular rural areas and should not be overlooked (Page et al., 2011).

2.2.2 Socio-economic status

A frequently used measure of economic hardship associated with health payments is “catastrophic” medical spending which is defined as spending over some threshold of household consumption (for example, 40%). One estimate suggests that 150 million households worldwide devote more than 40% of their non-food spending to health care (Kruk et al., 2009).

Women in highest wealth quintile are more likely to receive care from health professionals than those in the lowest wealth quintile, although the difference is small (Arthur, 2012). Household wealth index is associated with the use of health care services. A study conducted in Ghana has proven that households with higher income use public and private facilities as well as treatment charges at public facilities encourage caregivers to resort to private providers (Novington et al., 2010).

Women from wealthier households use health care services than those from less wealthy households. Women from middle wealth household and women from the richest households are more likely to use health care services compared with women from poorest wealth quintile (Tarekegn et al., 2014).

2.3 Distance to health facility

A study in South Africa showed that, developing countries in Africa and elsewhere, the small differences in distance can translate into large differences in access to health care. Inequality in access to health care is an important concern for health policy in developing countries. Health status influences human capital acquisition, economic status and the inter-generational transmission of socio-economic status, access to care plays a role in determining and reinforcing other measures of inequality (McLaren et al., 2014).

Distance decay is a term given to describe the effect of distance on interactions observed between two locations. It is observed that travel distance to health services is inversely proportional to the rate of service use, thereby resulting in geographical health care disparities. Therefore minimizing distance travelled to clinics can improve quality of care (Barth et al., 2015).

A study done in Kenya showed that, distance to a health facility was a challenge. Health care access was usually by foot across difficult terrain, made more problematic during the wet season. Although some routes were navigable by bicycle or motorbike, to hire transport required additional expenditure. Most carers reported that they walked, to the health facilities (Bedford & Sharkey, 2014).

In conclusion, from the literature review, diarrhoea still remains one of the leading cause of death among children under-five in Ghana and most developing countries. It was also proven that, a basic hygienic practice in the reduction of diarrhoea in developing countries is washing of hands. However, improving access to health care holds a great potential for the reduction of child death rates in Sub- Saharan Africa.



CHAPTER THREE

METHODOLOGY

3.1 Type of study

The data employed in this study was drawn from Demographic and Health Survey. It was a cross-sectional study conducted in the year 2008. It was a household-based survey conducted in Ghana by Ghana Statistical Service and the Ghana Health Service. Data was collected on demographic and health indicators such as fertility, contraceptive prevalence, nutritional status, infant and child mortality and anaemia prevalence.

3.2 Study area

The 2008 survey was conducted in Ghana and covered the entire ten regions, Greater Accra, Central, Eastern, Western, Ashanti, Northern, Upper East, Upper West and Volta. The Greater Accra Region is the smallest of the ten administrative regions in terms of area, occupying a total land surface of 3,245 square kilometres or 1.4% of the total land area of Ghana. In terms of population, however, it is the second most populated region, after the Ashanti Region. The Central Region occupies an area of 9,826 square kilometres or 4.1% of Ghana's land area, making it the third smallest in area after Greater Accra and Upper East. The Eastern Region, with an area of 19,323 square kilometres, occupying 8.1% of the total land area of Ghana and it is the sixth largest region of the country with total of 2,106,696 population.

The western region has about 75% of its vegetation within the high forest zone of Ghana, and lies in the equatorial climatic zone that is characterized by moderate temperatures. Ashanti Region is centrally located in the middle belt of Ghana. It shares boundaries with four of the ten political regions, Brong-Ahafo in the north, Eastern Region in the east,

Central Region in the south and Western Region in the South west. The Northern Region, which occupies an area of about 70,383 square kilometres, is the largest region in Ghana in terms of land area. It shares boundaries with the Upper East and the Upper West Regions to the north, the Brong-Ahafo and the Volta Regions to the south. The Upper East Region of Ghana is located in the north eastern corner of the country between longitude 00 and 10 West and latitudes 10° 30'N and 11°N and bordered by Burkina Faso to the north and Togo to the east. The Upper West Region of Ghana covers a geographical area of approximately 18,478 square kilometres. This constitutes about 12.7% of the total land area of Ghana.

The Volta Region is one of Ghana's ten administrative regions. The Volta region of Ghana lies to the east of the Volta lake. The region covers an area of 20,570 square kilometres representing 8.6% of Ghana. The Brong-Ahafo Region is located in southern part of Ghana. Brong-Ahafo is bordered to the north by the Black Volta River and to the east by the Lake Volta, and to the south by the Ashanti region, Eastern and Western regions, and to the west by the Ivory Coast southeastern border.

Ghana is centrally located on the West African coast and has a total land area of 238,537 square kilometres. It is bordered by three French-speaking countries: Togo on the east, Burkina Faso on the north and northwest, and Côte d'Ivoire on the west. The Gulf of Guinea on the south forms a coastline extending 560 kilometres. Ghana is a lowland country except for a range of hills on the eastern border and Mt. Afadjato the highest point above sea level (884 metres) which is west of the Volta River. Ghana can be divided into three ecological zones: the sandy coastline backed by a coastal plain, which is crossed by

several rivers and streams; the middle belt and western parts of the country, which are heavily forested and have many streams and rivers; and a northern savannah, which is drained by the Black and White Volta rivers.

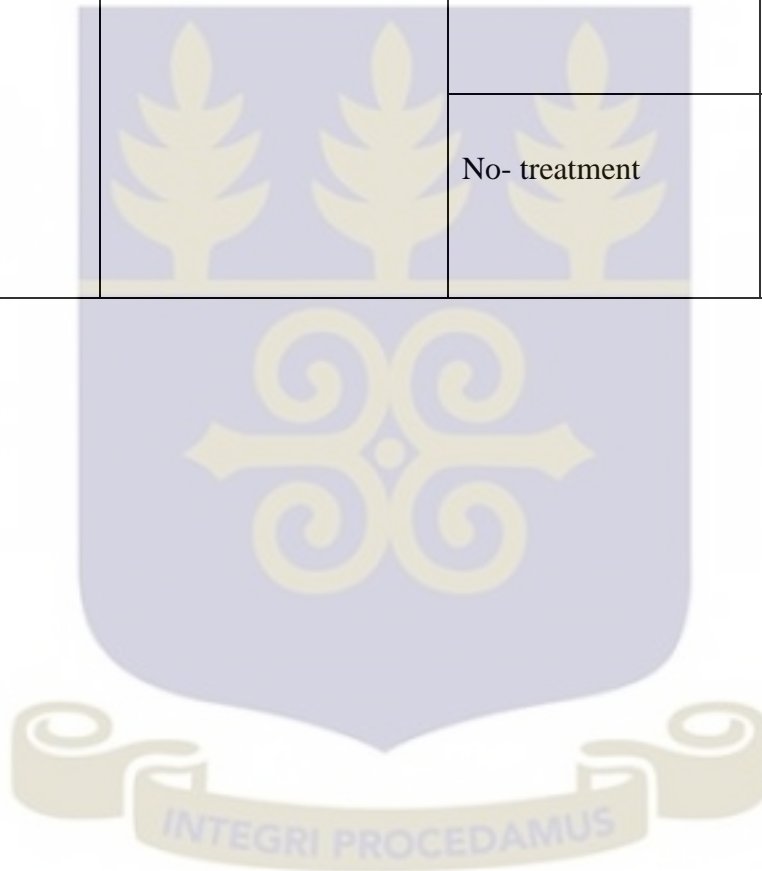
3.3 Variables

Table 1 provided the description of the dependent variables. It encompasses the type of variables and the explanations of the type of facility utilised by children under five years with diarrhoea. The main dependent variable is health care utilisation.



Table 1: Description of dependent variables

| Type of variable | Variable | Health care providers | Description |
|------------------|-------------------------|-----------------------|--|
| Dependent | Health Care Utilisation | Public facility | Children under five years who attend public facility |
| | | Private facility | Children under five years who attend private facility |
| | | Over-the-counter | Children under five years who use other facilities |
| | | No- treatment | Children who did not attend any facility for treatment |



The table 2 provides the description of the independent variables used in the study. It includes all the variables and description

Table 2: Description of independent variables

| Type of variable | Variables | Description |
|------------------|----------------------------------|--|
| Independent | Age | Age of under five children |
| | Sex | Gender of under five children |
| | Mother's education | The education level of mothers |
| | Socio-economic status | Different socio-economic status of the households |
| | Distance to health facility | Distance between facilities and houses |
| | Getting permission for treatment | Difficulties mothers have to get permission to facilities |
| | Source of water | Source of drinking water for household |
| | Time | Time spent during treatment |
| | Toilet facility | Type of toilet used by households |
| | Getting money for treatment | How mothers get money to send their children for treatment |
| | Father's education | The education level of fathers |
| | Place of residence | Households who stay in the rural and the urban areas. |

3.4 Study population

The study population covered all under-five years children in Ghana who were part of 2008 GDHS with household sample of more than 12,360. The population covered in the 2008 GDHS is defined as the universe of all women age 15-49 in Ghana in a sample of 6,180 selected households (half of 12,360). Every household selected for the women's sample was also eligible for the men's sample. All 12,360 households were selected for

the household interview to identify deaths in the past three years among children under five years for administering (at the national level only) the verbal autopsy questionnaire on causes of death.

3.5 Target population

Children under five years with diarrhoea were the target population covered in the study. The study covered all the children under five years in the ten administrative regions of Ghana who were part of the 2008 GDHS. Most of the information concerning the children under five years with diarrhoea were found in the women's questionnaire.

3.6 Sampling method

The 2008 GDHS survey was designed to allow reliable estimation of key demographic and health indicators such as fertility, contraceptive prevalence, nutritional status, infant and child mortality, and anaemia prevalence. The major domains distinguished in the tabulation of important characteristics for the eligible female population were; Ghana as a whole, each of the ten regions Brong Ahafo, Ashanti, Greater Accra, Western, Eastern, Central, Northern, Volta, Upper West and Upper East and Urban and Rural areas of Ghana.

Administratively, Ghana is divided into 10 regions. Each administrative region is subdivided into districts and each district is divided into localities. In addition to these administrative units, during the 2000 Population Census, each locality was subdivided into convenient areas called census enumeration areas (EAs). Each EA was either all urban or all rural. The list of EAs includes census information on households and population information, all grouped by administrative unit. The 2000 Population Census was used as

the sampling frame for the 2008 GDHS, and the stratification process for the 2008 GDHS sample used the census administrative subdivisions.

The 412 selected households in the country as a whole were divided into 182 clusters in urban areas and 230 clusters in rural areas. For women, a total of 6,141 households was selected, of which almost 5,829 were successfully interviewed, with a household response rate of 98.5%. For men, a total of 6,141 households was selected, of which almost 5,829 were successfully interviewed, for a household response rate of 98.5% (GSS et al., 2009).

3.7 Data collection techniques and tools

The instrument used was structured questionnaires from GDHS which were used to collect data on infant and child mortality. The 2008 GDHS questionnaire was divided into three main sections; household questionnaire, woman's questionnaire and man's questionnaire. The woman's questionnaire which was mainly used in the study was categorized into 11 sections. They are respondent's background, reproduction, contraception, pregnancy and postnatal care, child immunization and health and child's and woman's nutrition, fertility references, husband's background and woman's work, HIV/AIDS, other health issues and domestic violence.

3.8 Quality Control

The processing of the GDHS, (2008) results began shortly after the fieldwork commenced. Completed questionnaires were returned periodically from the field to the GSS office in Accra, where they were entered and edited by data processing personnel who were specially trained for this task. Data were entered using CSPro, a programme specially developed for use in DHS surveys. All data were entered twice (100 percent verification).

The concurrent processing of the data was a distinct advantage for data quality, because GSS had the opportunity to advise field teams of problems detected during data entry. The data entry and editing phase of the survey was completed in February 2009.

3.9 Data Analysis

The data was analysed using Stata version 12.0 Software. Summary statistics such as frequencies and proportions are shown using tables. Multinomial probit model was used due to the nature of the dependent variable with four options (public, private, over-the-counter and no-treatment) and the ability of the model to estimate the choice of the health care service used. The model also has the ability to estimate all choices in a single equation.

Principal component analysis was used to analyse the wealth of the household by grouping it into five quintiles (poorest, poorer, middle, richer and richest) to see the differences in health care utilisation. Principal component analysis is a statistical procedure in which its results are usually discussed in terms of component scores. Principal component analysis is the simplest of the true eigenvector-based multivariate analysis. Often, its operation can be thought of as revealing the internal structure of the data in a way that best explains the variance in the data. It was showed that households in richest socio-economic status use private health facilities.

Pearson's chi-square test was used to test for a significant association between health care utilization and socio-economic status of the household. A significance level was set at 0.05 and Categorical variables were compared using logistic regression to test the association between dependent and independent variables.

The analysis was based on 549 observations that met the stipulated criteria of having children who had diarrhoea within the last two weeks of the survey being conducted. Before analysis was done, various data cleaning processes were conducted to make the raw dataset fit for analysis. The major dependent variable of interest in this study was the Health care utilisation of under-5 year old children who experienced diarrhoea; four health-facility options were used to assess this utilization. These were public facility providers, private facility providers, over- the- counter and No-treatment.

Public facility providers included Government of Ghana Hospital/Polyclinic, Government health center, Government health post/CHPS, mobile clinic and field worker. Private facility included private hospital/clinic, pharmacy, private doctor, mobile clinic, field worker, Planned Parenthood Association of Ghana (PPAG) clinic and maternity home. Over-the-counter include other sources such as shop/market, traditional practioner, drug peddler while No-treatment includes children under five who did not visit any facility for treatment

3.9.1 Dataset cleaning

The dataset used in the study was children under-five years data set from GDHS. All the variables in the dataset which were not directly related to the study were dropped using STATA version 12.0 software. Additionally, recoding of needed variables, such as unifying different questions on health-facility used into one variable was performed to allow for easier analysis, while independent variables which had more than four categories were recoded into fewer categories in order not to have more than four categories for any

variable. The categories that were similar were grouped in such a way that it did not have any effect on the overall observation.

3.10 Ethical Consideration/ Issues

The study was reviewed by the Ethical Clearance Committee of Research & Development Division from the Ghana Health Service. Permission and approval were sought from Ghana Statistical Service and ICF macro who conducted the Demographic and Health Survey 2008.

3.10.1 Description of subjects involved in the study

The children under five years with diarrhoea were selected from the ten regions of the country. The mothers of these children were interviewed about diarrhoea. All the information about the children under five years were obtained from the woman's questionnaire in the 2008 GDHS.

3.10.2 Potential risk and benefits

This study poses no risk to either the study population or the society. The study was envisaged to be beneficial to both the study population and the society in many ways. The study provided the population knowledge about factors influencing health care utilisation for diarrhoea in children under five years. It provided useful information for strategic planning for the management of diarrhoea in the country.

3.10.3 Confidentiality

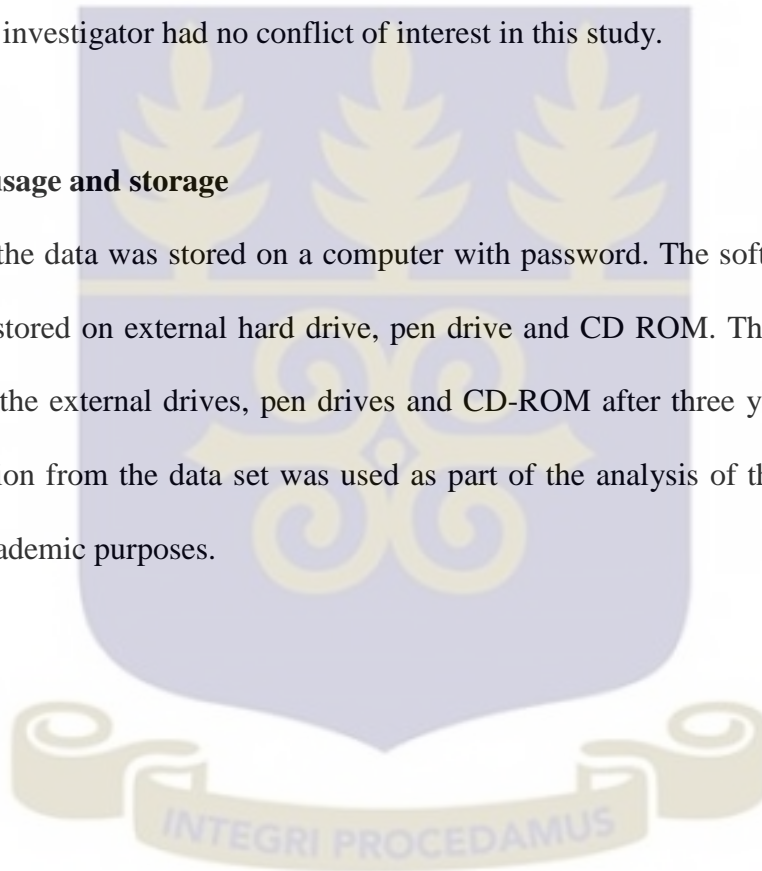
The data set that was used in the study was not made known to the public because it contains names, house numbers and details of the households. The principal investigator did not allow anyone to use the laptop which he has stored the data set.

3.10.4 Declaration of conflict of interest

The principal investigator had no conflict of interest in this study.

3.10.5 Data usage and storage

Soft copy of the data was stored on a computer with password. The soft copy of the data set was also stored on external hard drive, pen drive and CD ROM. The data set will be deleted from the external drives, pen drives and CD-ROM after three years of the study. The information from the data set was used as part of the analysis of the study which is mainly for academic purposes.



CHAPTER FOUR

RESULTS

4.1 Background characteristics of the households

Table 3 represents the background characteristics of the households. The ages of the children under five years ranged from <1-4 years, with mean age being 1.60 (± 1.26) years, and most of the children (32.8%) were 1 year old. Children under five years who were males (50.6%) were more than the females (49.4 %). Table 3 also shows that the tertiary education of fathers, representing 7.9% (n=25), is higher than mothers' tertiary education which represents 1.6% (n=5). In terms of socio-economic status, the proportion of those from the poorest households constituted 38.4% (n=211) of the total study population, which was much higher than those in richest households representing 6.7% (n=37) of the same population.

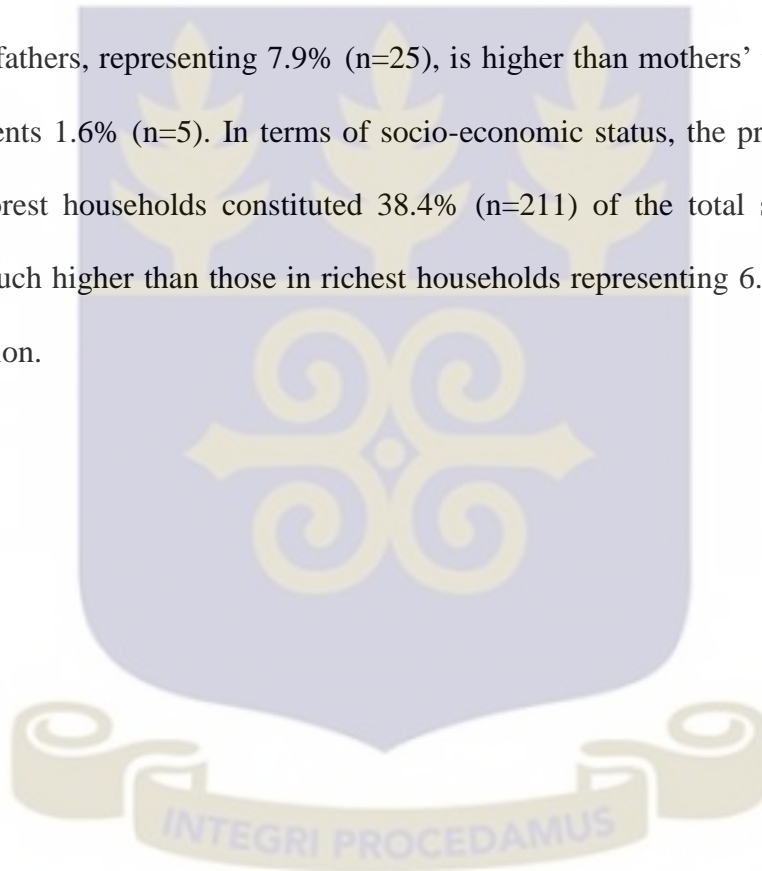


Table 3: Background characteristics of the households

| Characteristics | Number | Percentage |
|---------------------------------|--------|------------|
| Age of child (years) | | |
| <1 | 115 | 21.0 |
| 1 | 180 | 32.8 |
| 2 | 124 | 22.6 |
| 3 | 69 | 12.6 |
| 4 | 61 | 11.1 |
| Sex of child | | |
| Female | 271 | 49.4 |
| Male | 278 | 50.6 |
| Mother highest education | | |
| Primary | 128 | 41.7 |
| Middle/JHS | 156 | 50.7 |
| Secondary/SHS | 19 | 6.2 |
| Tertiary | 5 | 1.6 |
| Father highest education | | |
| Primary | 74 | 23.3 |
| Middle/JHS | 166 | 52.2 |
| Secondary/SHS | 53 | 16.7 |
| Tertiary | 25 | 7.9 |
| Socio-economic status | | |
| Poorest | 211 | 38.4 |
| Poorer | 126 | 23.0 |
| Middle | 103 | 18.8 |
| Richer | 72 | 13.1 |
| Richest | 37 | 6.7 |

4.2 Health care utilisation for children under five years

Table 4 indicates health care utilisation for children under five years. The results shows the significant association between socio-economic status and health care utilisation ($p=0.003$). Households in the poorest socio-economic status 40.9% ($n=79$) who do not go for treatment were higher than households in the richest socio-economic status 6.2% ($n=12$) who do not also go for treatment. Households in the poorest socio-economic status who visit public facility 42.4% ($n=81$) were more than households in the richest socio-economic status 6.3% ($n=12$) who also visit public facility.

The richer households in the socio-economic status 37.5% ($n=12$) who attend private facility were more than households in the poorest socio-economic status 9.4% ($n=3$) who also attend private facility. Households in the poorest socio-economic status 33.6% ($n=43$) who visit OTC (other facilities) were more than those in the richest socio-economic status 6.3% ($n=8$) who use OTC (other facilities).

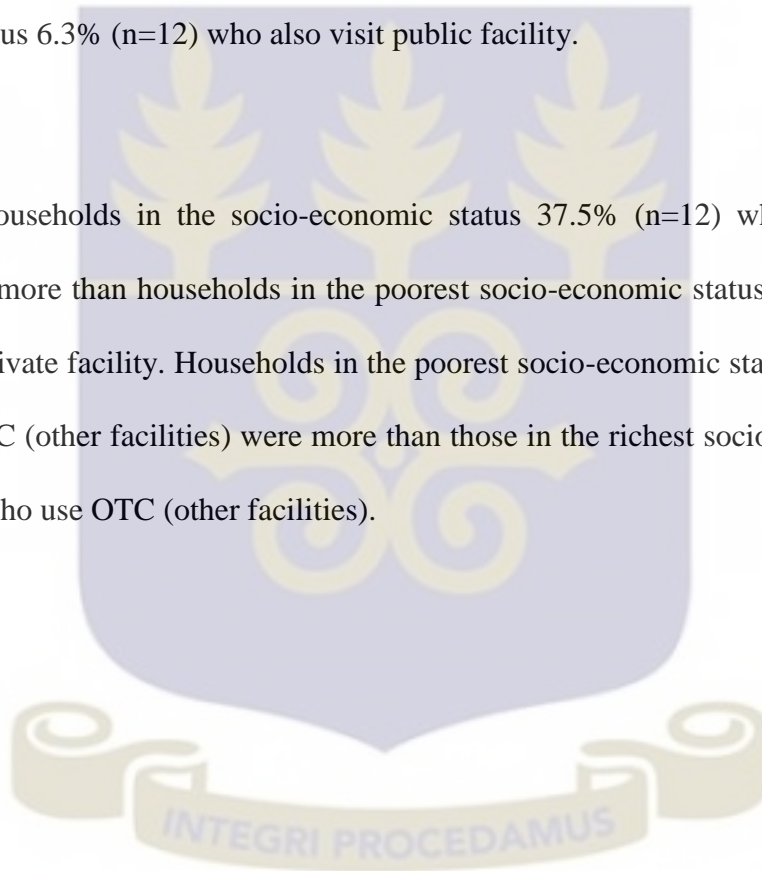


Table 4: Health care utilisation for children under five years

| Characteristics | No-treatment n (%) | Public n(%) | Private n(%) | OTC n(%) | Total |
|-----------------------|-----------------------|----------------|-----------------|-------------|-----------|
| Socio-economic Status | | | | | |
| Poorest | 79(40.9) | 81(42.4) | 3(9.4) | 43(33.6) | 206(37.9) |
| Poorer | 45(23.3) | 41(21.5) | 7(21.9) | 33(25.8) | 126(23.2) |
| Middle | 34(17.6) | 35(18.3) | 5(15.6) | 29(22.6) | 103(18.9) |
| Richer | 23(11.9) | 22(11.5) | 12(37.5) | 15(11.7) | 72(13.2) |
| Richest | 12(6.2) | 12(6.3) | 5(15.6) | 8(6.3) | 37(6.8) |

4.3 Factors influencing health care utilisation in children under five years

4.3.1 Social factors

Table 5 indicates social factors influencing health care utilization. There was a significant association between middle/JHS education of mothers who attend public facility and health care utilisation ($p=0.028$). The significant association between health care utilisation and mothers who had middle/JHS education and visit OTC (other facilities) was ($p=0.047$). There is also a significant association between mothers who had secondary/SHS education and health care utilisation ($p=0.026$).

There was no significant association between permission to facility and health care utilisation ($p=0.364$). The association between distance to facility and health care utilisation was not significant ($p=0.107$).

Mothers who had middle/JHS education are more likely (0.580) to attend public facility than to have no-treatment compared with those who had primary education and mothers who also had middle/JHS education are more likely (0.538) to use OTC (other facilities) than to have no-treatment compared with those who had primary education. Mothers who

had secondary/SHS are more likely (1.218) to attend public facility than to have no-treatment compared with mothers who had primary education.

Mother's education showed as social factor influencing health care utilisation. Mothers who had middle/JHS and secondary education are more likely (0.580) to use health facility for treatment than those who had primary education. Mother's education plays important role and creates general awareness of the health of the family. Therefore the education of mothers in the country should be encouraged because mothers play very important role in the health concerning their children. When mothers are educated, they are more likely to send their children for treatment which can help to reduce the child mortality.

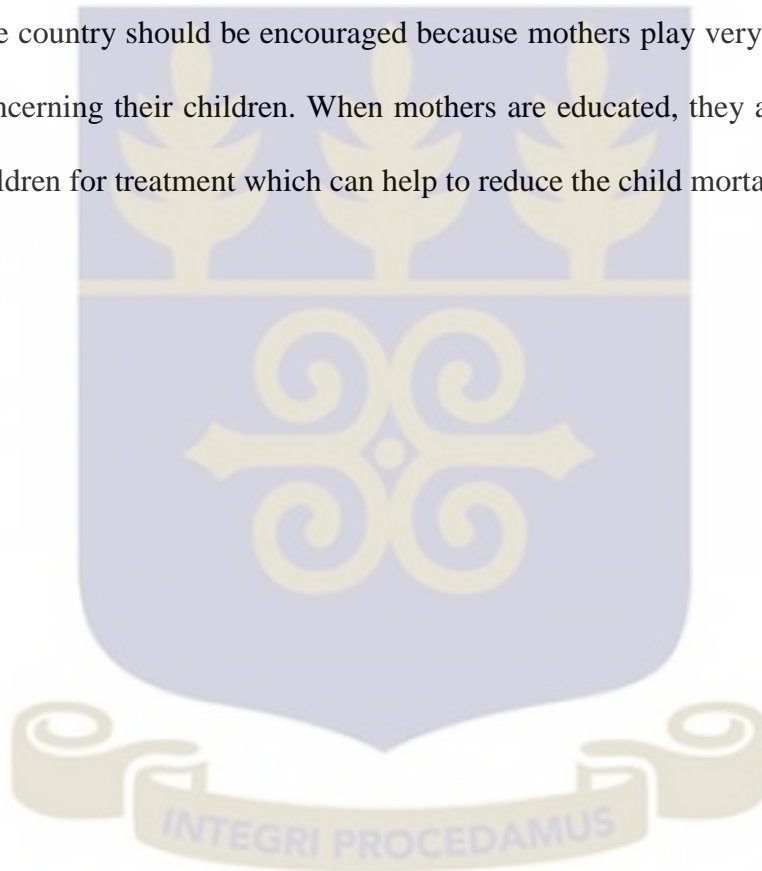


Table 5: Social factors

| Characteristics | Public Coefficient | (CI) | P-value | Private Coefficient | (CI) | P-value | OTC Coefficient | (C I) | P-value |
|-----------------------------------|-----------------------|---------------|---------|------------------------|---------------|---------|--------------------|---------------|---------|
| Mother's highest education | | | | | | | | | |
| Primary (rc) | | | | | | | | | |
| Middle/JHS | 0.580 | (0.06,1.10) | 0.028* | 0.124 | (-0.5, 0.79) | 0.715 | 0.538 | (0.01, 1.07) | 0.047* |
| Secondary/SHS | 1.218 | (0.15,2.29) | 0.026* | 0.089 | (-1.37,1.55) | 0.904 | 0.723 | (-0.41, 1.86) | 0.213 |
| Tertiary | 0.325 | (-1.65,2.30) | 0.747 | 0.282 | (-1.83, 2.39) | 0.793 | 0.499 | (-1.49, 2.49) | 0.622 |
| Permission | 0.413 | (-0.48,1.30) | 0.364 | -0.184 | (-1.22, 0.85) | 0.727 | 0.317 | (0.54, 1.17) | 0.469 |
| Distance | 0.48 | (-0.10,1.06) | 0.107 | 0.005 | (-0.77, 0.78) | 0.990 | 0.136 | (-0.45, 0.72) | 0.647 |
| Constant | -3.126 | (-5.55,-0.70) | 0.012 | -2.761 | (-5.70,0.18) | 0.065 | -1.690 | (-4.14, 0.76) | 0.177 |

Log likelihood = -368.8447

Number of observation = 307

Wald chi2(57) = 49.09

Prob > chi2 = 0.7627

Note:*, denotes variables that were significant at 0.05

(rc) represents the reference category and has been placed in front of variables that were used as reference category



4.3.2 Economic factors

Table 6 shows economic factors influencing health care utilisation. There was a significant association between households in the richer socio-economic status and health care utilisation ($p=0.028$), households in the richer socio-economic status are more likely (1.609) to attend private facility than to have no-treatment compared with households in the poorest socio-economic status.

Table 6 shows that, the association between households in the richest socio-economic status and health care utilisation is significant ($p=0.029$). Households in the richest socio-economic status are more likely (2.005) to attend private facility than to have no treatment compared with households in the poorest socio-economic status. There was no significant association between money for treatment and health care utilisation ($p=0.863$).

The study found that households in the richest socio-economic status frequently utilise private health facilities more than the households in the poorest socio-economic status. This clearly shows that, increase in the socio-economic status of households will increase the utilisation of health facilities.

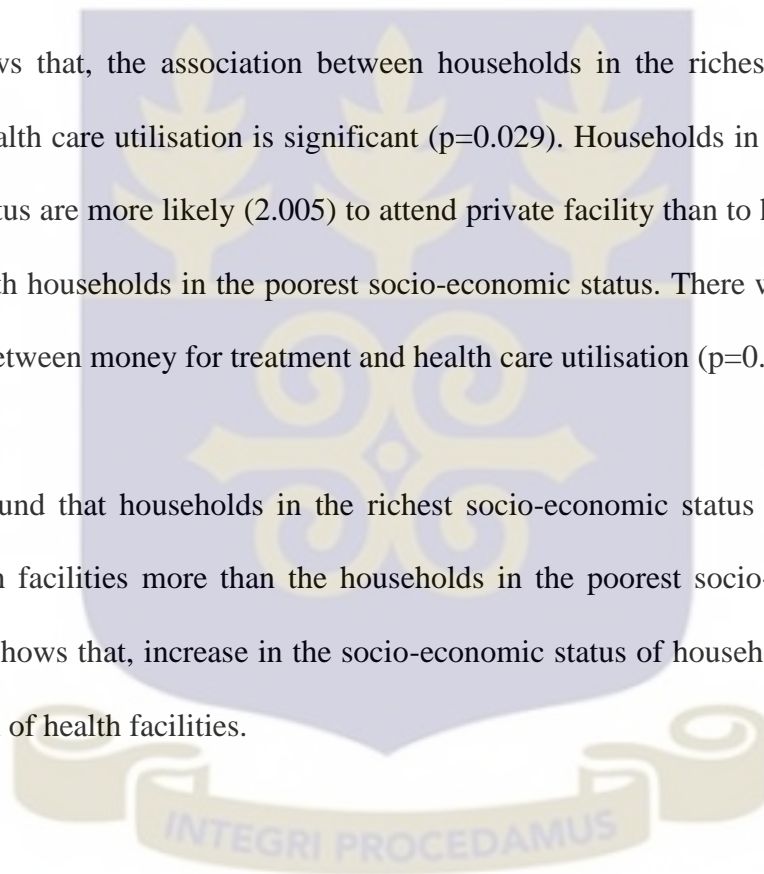


Table 6: Economic factors

| Characteristics | Public Coefficient | CI | P-value | Private Coefficient | CI | P-value | OTC Coefficient | CI | P-value |
|------------------------------|-----------------------|----------------|---------|------------------------|---------------|---------|--------------------|---------------|---------|
| Socio-economic status | | | | | | | | | |
| Poorest (rc) | | | | | | | | | |
| Poorer | -0.141 | (-0.91, 0.62) | 0.719 | 0.793 | (-0.51, 2.10) | 0.233 | -0.188 | (0.98, 0.60) | 0.639 |
| Middle | -0.042 | (-0.88, 0.80) | 0.922 | 0.678 | (-0.71, 2.06) | 0.337 | -0.324 | (-1.21, 0.57) | 0.472 |
| Richer | 0.194 | (-0.80, 1.18) | 0.701 | 1.609 | (0.17, 3.05) | 0.028* | -0.445 | (-1.47, 0.58) | 0.394 |
| Richest | 0.618 | (-0.77, 2.00) | 0.383 | 2.005 | (0.20, 3.81) | 0.029* | -0.061 | (-1.47, 1.34) | 0.933 |
| Money for treatment | -0.043 | (-0.53, 0.45) | 0.863 | 0.264 | (-0.41, 0.94) | 0.443 | -0.072 | (-0.58, 0.43) | 0.778 |
| Constant | -3.126 | (-5.55, -0.70) | 0.012 | -2.761 | (-5.70, 0.18) | 0.065 | -1.690 | (-4.14, 0.76) | 0.177 |

Log likelihood = -368.8447

Number of observation = 307

Wald chi2(57) = 49.09

Prob > chi2 = 0.7627

Note:*, denotes variables that were significant at 0.05

(rc) represents the reference category and has been placed in front of variables that were used as reference category



4.3.3 Environmental factors

Table 7 shows environmental factors influencing health care utilisation. There was a significant association between households who use pit as toilet facility and health care utilisation ($p=0.071$). There was a significant association between households who use composting as toilet facility and attend public facility and health care utilisation ($p=0.022$). There was also a significant association between households who use composting and visit OTC ($p=0.027$) and health care utilisation.

Households who use pit as toilet facility are more likely (1.089) to use OTC (other facilities) than to have no-treatment compared with those who use flush toilet facility. Households who use composting as toilet facility are more likely (1.514) to attend public facility than to have no-treatment compared with those who use flush toilet facility. Households who use composting are more likely (1.503) to visit OTC (other facilities) than to have no-treatment compared with those who use flush toilet facility.

There was no significant association between place of residence and health care utilisation ($p=0.591$). There was no significant association between source of water and health care utilisation ($p=0.144$).

Table 7: Environmental factors

| Characteristics | Public | | | Private | | | OTC | | |
|------------------------|-------------|----------------|---------|-------------|---------------|---------|-------------|---------------|---------|
| | Coefficient | (CI) | P-value | Coefficient | (CI) | P-value | Coefficient | (CI) | P-value |
| Place of residence | 0.170 | (-0.45, 0.80) | 0.591 | -0.017 | (-0.79, 0.75) | 0.966 | -0.323 | (-0.95, 0.31) | 0.315 |
| Source of water | | | | | | | | | |
| pipe (rc) | | | | | | | | | |
| Well | 0.465 | (-0.16, 1.09) | 0.144 | 0.188 | (-0.58, 0.95) | 0.629 | 0.086 | (-0.54, 0.71) | 0.786 |
| River | -0.251 | (-1.69, 1.19) | 0.733 | -0.449 | (-2.12, 1.22) | 0.597 | 0.237 | (-1.14, 1.61) | 0.735 |
| Sachet | -0.116 | (-0.94, 0.71) | 0.784 | -0.193 | (-1.35, 0.96) | 0.743 | -0.529 | (-1.36, 0.31) | 0.214 |
| Toilet facility | | | | | | | | | |
| flush (rc) | | | | | | | | | |
| Pit | 0.62 | (-0.53, 1.77) | 0.292 | 0.829 | (-0.48, 2.14) | 0.214 | 1.089 | (-0.09, 2.27) | 0.071* |
| Composting | 1.514 | (0.22, 2.81) | 0.022* | 1.307 | (-0.26, 2.87) | 0.101 | 1.503 | (0.17, 2.83) | 0.027* |
| Constant | -3.126 | (-5.55, -0.70) | 0.012 | -2.761 | (-5.70, 0.18) | 0.065 | -1.690 | (-4.14, 0.76) | 0.177 |

Log likelihood = -368.8447

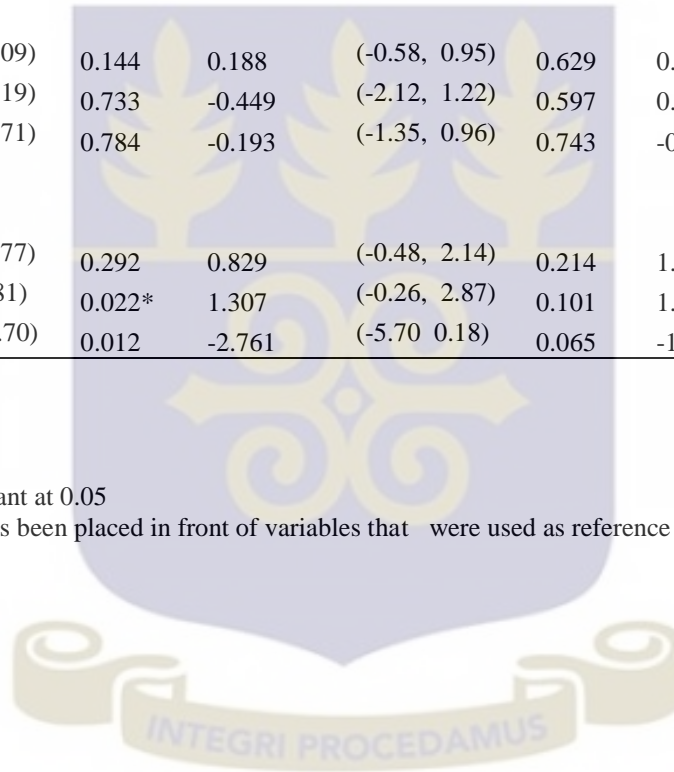
Number of observation = 307

Wald chi2(57) = 49.09

Prob > chi2 = 0.7627

Note:*, denotes variables that were significant at 0.05

(rc) represents the reference category and has been placed in front of variables that were used as reference category



CHAPTER FIVE

DISCUSSIONS

Mother's education is a factor influencing health care utilisation. Socio-economic status was found in the study as a factor that influence health care utilisation. Toilet facility used by the households also proved in the study as a determinant of health care utilisation in children under five years with diarrhoea. The study also showed that households in the richer and richest socio-economic status prefer to use private health facilities than not to have any treatment at all as compared to the households in the poorest socio-economic status.

5.1 Health care utilisation for children under five years

The study found that households in the richest socio-economic status frequently utilise private health facilities more than the households in the poorest socio-economic status. This is consistent with previous studies conducted in Ghana which states that, households with higher income use private facilities (Novington et al., 2010). Arthur (2012) suggested that, household wealth index is associated with the use of health care services and women in the highest wealth quintile are more likely to receive care from health professionals than those in the lowest wealth quintile. Tarekegn et al., (2014) also proved that, wealthier households use health care services than those from less wealthy households.

The reason might be as a result of the financial constraints of the households in the poorest socio-economic status. Kruk et al., (2009) suggested that, one of the frequently used measure of economic hardship associated with health payments is higher medical spending which is defined as spending over some threshold of the house consumption. It further stated that over 150 million households worldwide devote more than 40% of their non-

food spending to health care. Bakeera et al., (2009) confirmed to the findings of this study that, households in the poorest socio-economic status are keen to utilise public health services which are provided free of charge. Therefore it implies that, households in the poorest socio-economic status do not use private facility compared with households in the richest socio-economic status because of financial difficulty and can lead to higher disease prevalence as confirmed by Lemstra et al., (2009).

The findings of a similar studies conducted by Falkingham, (2004) is consistent with the results of this study which proved that, very poor households less utilise health care facility due to lack of resources, perhaps the introduction of national health insurance in Ghana will increase the utilisation of public and private health facilities by households in the poorest socio economic status. There is no doubt that Rina et al., (2013) suggested that, diarrhoea incidence remains a tremendous burden on children in low income countries due to determinants such as low socio-economic status.

5.2 Factors influencing health care utilisation

Socio-economic status was found in the study as a determinant of health care utilisation. This is consistent with findings from Ayanda, (2014). There was a significant association between socio-economic status of the households and health care utilisation. Awoyemi et al., (2011) stated that health care utilisation of a population is related to quality and cost of services, as well as social economic structure.

Socio-economic status has been proven in the results as a factor influencing health care utilisation in this study which has been confirmed by Dunlop et al., (2000). Previous studies by Khanal et al., (2014) in Nepal showed wealth status as a factor that influences health care utilisation. It further stated that mothers from high socio-economic status

family with higher education were more likely to utilise health care services likewise mothers with agricultural occupation were less likely to utilise health care services. The results is also consistent with those of previous studies carried out by (Ken & Briggs, 2001; Celik & Hotchkiss, 2000).

Mother's education proved in this study as a factor influencing health care utilisation. Mothers who had middle and secondary education utilised private facility compared with those who had primary education. Miherete et al., (2014) was of the view that mothers with some education protected their children against diarrhoea better than mothers with no education. The results is in conformity with the findings from previous studies that, education plays an important role and creates general awareness about the matters which affect the quality of life, therefore, female education is of crucial significance as it affects the family's health Khan & Soomro, (1994).

The educated mothers utilised private health facilities because they can afford it. This is consistent with previous studies that, educated women have the ability to afford the cost of medical health care, and their enhanced level of autonomy that result in improved ability and freedom to make health related decisions (Babalola & Fatusi, 2009; Simkhada et al., 2008).

Toilet facility was significantly associated with health care utilisation and was shown to be a determinant of health care utilisation. Fobil et al, (2012) confirmed that socio-economic and environmental conditions are risk factors for diarrhoea mortalities. It was indicated that households who use composting which is a type of toilet facility in their homes attend public facility more than the households who use a flush toilet. Previous studies consistent with the findings of this study by Fatima & Avan, (2012) showed that type of toilet is an

important determinant of health service utilisation. The finding can lead to the fact that households who use flush toilet do not get diarrhoea frequently compared with those who use composting as their toilet facility.

Socio-economic status proved as the economic determinant and has direct relationship with health care utilisation as indicated in the study. Toilet facility has shown as environmental determinant of health care utilisation which makes the framework for health care utilisation in this study appropriate. Mother's education indicated as a social determinant of health care utilisation. Therefore the framework for the study is indeed appropriate.

5.3 Limitations of the study

The limitation of the study was that, there was a single question that asked about distance to health facility, "permission to facility" and "money for treatment" in the GDHS 2008 questionnaire. This question asked about many different factors that can prevent women from getting medical advice or treatment and combined all the factors. Although previous study has suggested that distance and travel cost are barriers to health care utilisation (Ansah et al., 2009).

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

The findings of the study showed socio-economic status as a factor influencing health care utilisation. Mother's highest education proved as a social factor influencing health care utilisation. Toilet facility used by the households also indicated as a determinant of health care utilisation.

The findings of the study show how important policy makers, should focus on policies concerning children under five years in Ghana. Improvement in the socio-economic status of the poorest households in the country can help to improve the use of public and private health facilities in order to reduce the mortality of children under five years with diarrhoea in Ghana.

6.2 Recommendations

The outcome of this study has very important public health implication. The findings of this study indicate the need for the Ghana Health Service to educate the public about health care utilisation. The public should also be educated on the importance of the use of health care services for the management of diarrhoea in children under five and how it can help to reduce child mortality in Ghana.

6.2.1 Academia and Research Institution

Future studies similar to this may focus on other health related diseases affecting children under five years in Ghana. I will also recommend that institutions should use secondary data for their research.



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APPENDIX: ETHICS APPROVAL LETTER

