REGIONAL INSTITUTE FOR POPULATION STUDIES (RIPS)

UNIVERSITY OF GHANA

MATERNAL EDUCATION AND CHILD SURVIVAL IN GHANA

BY

CHARLES KOFI SOM

(10329102)

THIS THESIS/DISSERTATION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MA POPULATION STUDIES DEGREE.

JULY 2014

ACCEPTANCE

Accepted by the Faculty of Social Studies, University of Ghana, Legon in partial fulfilment of the requirements for the degree of MA (Population Studies)

SUPERVISOR OF THESIS: ……..

PROF. S. N. A. CODJOE

…….

DECLARATION

I hereby declare that, except for references to other studies which have been duly acknowledged, this dissertation is my own original work and that it has not been presented in whole or in part anywhere for another degree.

…….

CHARLES KOFI SOM

……...

DEDICATION

I dedicate this piece of work to ***the Almighty God***, my glory and the lifter of my head.

ACKNOWLEDGEMENTS

I thank the Almighty God for his grace, guidance and inspiration throughout this course. I am also sincerely grateful to my supervisor, Prof. S. N. A. Codjoe for the tremendous attention he paid to my work. I say God richly bless him and I appreciate his constructive criticisms. I wish to wholeheartedly express my sincere gratitude to Dr. Delali Badasu and Dr. Philomena Nyarko for their encouragement and support.

I am also grateful to the Staff and Lecturers of the Regional Institute for Population Studies (RIPS) for the opportunity to be part of their loving family.

I also wish to thank all the PhD students at RIPS, especially Adriana and Phidelia for their assistance and support.

And to my colleagues (2013/2014 academic year), I appreciate the bits and pieces they added to my work and life. I am glad to have them as friends.

Never will I forget the contribution of Mary Colley, of the Ghana Statistical Service, as well as my senior colleague and friend Mr. Emmanuel Awadzi of the Ebenezer Senior High School and an Examiner with the West African Examination Council (WAEC) in Accra, for their prayers and support.

ABSTRACT

This study assessed the effect of education on child survival in Ghana using the data from the 2008 Ghana Demographic and Health Survey. The study involved a total of 2099 children born to mothers within the ages of 15-49 years in the last five years preceding the survey. The analysis was limited to the last child of each mother born within the study period. Univariate, bivariate and multivariate statistical tools were used to analyse the data. Of the 2099 children, 3.8 percent died while 96.2 percent survived. The mothers' level of education was found not to be significantly associated with child survival. Breastfeeding and number of ante natal visits were among the intermediate variables found to significantly influence child survival. Recommendations are that, rather than emphasizing formal education, there is the need for comprehensive basic health care education that encourages mothers to breastfeed and to make regular ante natal visits during pregnancy to ensure increased chances of child survival.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Intrinsic to societal development is education. It is the process of acquiring knowledge, skills, values and attitude to completely develop individual capabilities for societal well-being. On the other hand, literacy is the ability to read and write a simple statement with understanding. By the Ghana Statistical Service (GSS), if a person can only read but cannot write or can write but cannot read, he or she is not literate (GSS, 2009).

In September of the year 2000, leaders of 189 countries met at the United Nations in New York and endorsed the Millennium Development Goals, a commitment to work together to build a safer, more prosperous and equitable world. The Declaration was translated into a roadmap setting out eight time-bound and measurable goals to be reached by 2015, known as the Millennium Development Goals (UN, 2014). Goal two seeks to ensure that all boys and girls complete a full course of primary schooling, because evidence shows that, education and literacy are able to enhance one's standard of living.

The World Health Organization defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." Health indicators produced by the World Health Organization and other UN bodies include infant and child mortality rates, life expectancy, burden of disease, and disability-adjusted life years (DALYs). Improvements in these measures reflect improvements in quality of life (Bloom, 2006).

Healthy individuals also contribute to the good health of those around them because they do not spread infection, and they have the physical and mental strength to look after others. Robust health can often serve as a platform for progress in other areas, given a suitable policy environment (Bloom, 2006).

As part of the United Nations declaration on the Millennium Development Goals, reduction by two-thirds the mortality of children under five is the forth on the list (UN, 2014). Reduced child mortality calls for an improvement in child health.

Educated individuals have easier access to health information than those without education. The skills gained through schooling can help mothers absorb health information and adopt health-seeking behaviour. Many schools provide lessons on hygiene, nutrition, and sex education, and also encourage health-seeking behaviours such as washing hands before meals (families, of course, also provide much of this information to children). Good education nurtures inquisitiveness and teaches the links between cause and effect, with possible positive consequences for health outcomes as evidenced by the impact of maternal education on child health (LeVine, 1987; Buor, 2003; Caldwell, 1979).

Each year, over 9 million children die before their fifth birthday. These deaths are not equitably distributed across the world: nearly all occur in low- and middle-income countries (LMICs).Under-five mortality varies from 262 per 1000 live births in Sierra Leone to 3 per 1000 in Iceland. Childhood mortality has lately received renewed policy and research attention (Caldwell, 1979).

Following this premise, this study seeks to find the existence of an association between mother's education and child survival using the 2008 Ghana Demographic and Health Survey (GDHS) data set. Studies using data from the World Fertility Survey have shown that, on average, each one-year increment in maternal education corresponds to a reduction of seven to nine percent in mortality for children less than five years of age (Cleland and Van Ginneken, 1988). As one of the most common findings in the child survival literature, this relationship still remains one of the least understood.

1.2 Statement of the problem

The factors that affect child survival are almost invariably interdependent. For instance, occupation is related to education; income is related to education and both income and education may influence diet and livelihoods. The variations in the indicators by socio-economic background such as locality and region of residence, marital status, education, occupation and employment status of mothers exist in the country and would need to be addressed.

Findings from the World Fertility Survey and DHS surveys indicate that births to young mothers (under age 20 years) and older mothers (35 years and over) are at an elevated risk of mortality. Results from the GDHS confirm the expected curvilinear relationship between mother's age and child survival (GDHS, 2008).

The use of delivery facilities rises with level of mothers' education from 35 percent of births among women with no education to 91 percent among women with at least a secondary education. Similarly, mothers with secondary and higher education are

twice as likely to receive postnatal care from a health professional as those with no education. In general, women with at least a secondary education and women in the highest wealth quintile are least likely to report having a serious problem in accessing health facilities.

The 2008 GDHS findings on child health issues affecting child mortality focuses particularly on neonatal conditions (birth weight and size at birth), children's vaccination status, and treatment practices that are commonly used for children experiencing the three major childhood illnesses: acute respiratory infection (ARI), fever, and diarrhea. The information on children's birth weight and size, treatment practices, and contact with health facilities when children are sick paves the way to strategic planning and implementation of programmes to reduce neonatal and infant mortality. Combined with information on childhood mortality, this information can be used to identify subgroups of women and children who face increased risk because of non-use of maternal and child health (MCH) services, and to assist with planning effective improvements for these services.

Further, it is observed, there is little difference in the proportion of children fully vaccinated by sex of the child or by urban-rural residence. Boys (80 percent) and children in rural areas (79 percent) are slightly more likely to be fully vaccinated than girls and children in urban areas (78 percent each). The proportion of children fully immunised increases somewhat as birth order increases, from 73 percent among first births to 82 percent among births of order four or five. Coverage falls to below 60 percent for children in the Northern Region. Vaccination coverage varies in other regions, from 73 percent of children in the Central Region fully immunised to 94

percent in the Brong Ahafo Region. Children whose mothers attended only primary or middle/JSS school are more likely to be fully vaccinated than children whose mothers have no education. Surprisingly, children of mothers who attended secondary school or higher are among the least likely to be fully vaccinated, along with children of mothers with no education (74 and 73 percent, respectively).

Immunisation coverage has also improved among children of mothers with no education (27 percent increase) and children of mothers with primary education (23 percent increase). The regional differences in vaccination coverage should be interpreted with caution because of the small number of cases.

Pneumonia and other respiratory tract infections are leading causes of death among young children in Ghana. In the case of pneumonia, early diagnosis and treatment with antibiotics can prevent a large proportion of deaths due to acute respiratory infections (ARI).

From mothers' reports from 2008 GDHS survey estimated that 6 percent of children under five had symptoms of Acute Respiratory Infections (ARI) in the two weeks before the survey. Half of these children (51 percent) were taken to a health facility or provider.

Fever is a symptom of malaria and other acute infections in children. Malaria and other illnesses that cause fever contribute to high levels of malnutrition and reduced child survival. While fever can occur year-round, malaria is more prevalent after the end of the rainy season. Because malaria is a major contributory cause of death in infancy and childhood in many developing countries, the so-called presumptive treatment of fever with anti-malarial medication is advocated in many countries where

malaria is endemic. Fever prevalence decreases slightly as wealth quintile increases but shows no clear relationship by education of the mother. About half of children with a fever (51 percent) were taken to a health facility or provider for treatment. Of these, 43 percent were given anti-malarial drugs and one-fourth (25 percent) received antibiotics. The proportion of children who receive these treatments is higher in urban areas than rural areas, and among children whose mothers are better educated and live in wealthier households.

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 (ORT). Exposure to diarrhea-causing agents is frequently related to the use of contaminated water and to unhygienic practices in food preparation and disposal of excreta.

Prevalence of diarrhoea is lowest among children of mothers with secondary or higher education. From the 2008 GDHS report, diarrhoea prevalence is lowest among children who live in households with improved, not shared toilet facilities, and households that are in the highest wealth quintile. Again, diarrhoea prevalence is highest among children residing in households without improved source of drinking water. Oral rehydration therapy (ORT), which involves giving children with diarrhoea a solution prepared from oral rehydration salts (ORS) or recommended home fluids (RHF)—usually a homemade sugar-salt-water solution—is a simple and effective response to diarrhoea illness. Thirty-eight percent of children were given increased fluids. Overall, 67 percent of children under five with diarrhoea were treated with ORS, RHF, or increased fluids. Children under 12 months of age and children age 48-

59 months are less likely to receive ORT than other children. Children in rural areas, children whose mothers have no education, and children in the lowest wealth quintile are also less likely to receive ORT. One in eight children with diarrhoea was given no treatment at all (GSS, 2009).

Mothers are encouraged to continue normal feeding of children with diarrhoea and to increase the amount of fluids given. These practices help to reduce dehydration and minimise the adverse consequences of diarrhoea on the child's nutritional status.

Food intake is curtailed even more than fluid intake during episodes of diarrhoea. Only 9 percent of children with diarrhoea were given more to eat than usual, 29 percent were given the same amount of food as usual, and 56 percent were given less food to eat than usual or none at all. These patterns reflect a gap in practical knowledge among some mothers regarding the nutritional requirements of children during diarrhoea episodes. The 2008 GDHS findings indicate a need for further health education efforts to reduce the number of children that become dehydrated or malnourished because of improper feeding practices during diarrhoea.

Knowledge of ORS is widespread in Ghana, with 90 percent of mothers having heard of it. Younger mothers are slightly less likely to know about ORS than older mothers. Knowledge of ORS is higher among urban mothers and it increases with level of education and wealth quintile of mothers.

If human faeces are left uncontained, disease can spread by direct contact or by animal contact with the faeces. Hence, the proper disposal of children's stools is

important in preventing the spread of disease. Informed mothers may be more likely to practice proper disposal of faeces.

Children in urban areas and children living in households with an improved toilet facility are more likely to have safe disposal of their stools than children in rural areas and those in households without such facilities. By region, the proportion of children whose stools are disposed of safely ranges from 19 percent in the Upper West Region to 83 percent in the Eastern region. Safe disposal of children's stools increases with mother's level of education and household wealth quintile.

Further, estimates show that infant and under-five deaths rates are slightly higher in rural than in urban areas. In the five-year period before the 2010 Census, infant mortality in rural areas was 60 deaths per 1,000 live births compared with 55 deaths per 1,000 live births in urban areas. The under-five mortality rate during the same period was 90 deaths per 1,000 live births in rural areas compared with 83 deaths per 1,000 live births in urban areas (GSS, 2009).

Also, in the five years preceding the 2010 Census, infant mortality ranged from 48 deaths per 1000 live births in the Greater Accra Region to 81 deaths per 1000 live births in the Upper West Region. During the same period, under-five mortality rates ranged from 72 deaths per 1000 children in the Greater Accra Region to 128 deaths per 1000 children in the Upper West Region. Children in the Greater Accra Region experienced the lowest risk of infant and under-five mortality while those in Upper West Region where exposed to the highest risk of dying during the period under review. Children in the three northern regions are more exposed to the risk of dying in

childhood than their counterparts in other regions (GSS, 2009). Accra being the capital city, maybe most mothers are informed on childcare as compared to the three northern regions.

The higher the educational level of mothers, the better the survival experience of their children. Data from the 2010 Census indicate that the children of mothers with no education experience infant and under-five mortality of 62 deaths per 1,000 live births and 95 deaths per 1,000 children respectively compared with 52 and 78 as mothers' education increases to the secondary school level or higher. The estimates based on the 2000 and 2010 censuses show that the infant mortality rate declined from 90 to 59 infant deaths per 1,000 live births during the period 1992-2006, whilst the under five mortality dropped from 167 to 90 child deaths per 1,000 children during the same period.

The relatively high infant, child and maternal mortality rates present challenges to the achievement of Millennium Development Goals 4, which are the indicators on child health. Given the rates, there will be the need for proactive measures aimed at reducing infant, child mortality. At the current pace of decline, the under-five mortality is unlikely to be reduced by two-thirds within the next three years (2015) as per the MDG target.

The 2010 Population and Housing Census results indicate that primary school enrollment level parity for girls have stagnated at 0.96 since 2006-2007, while the parity at the JHS increased slightly from 0.91 in 2006-2007 to 0.92 in 2007-2008.

With only one year to the end of the Millenium Development Goals, Ghana is about 10 percent short of achieving universal basic education.

There is evidence that universal attendance envisaged by the new education strategy at the preschool level has not yet been achieved. That means some Ghanaian children still start primary school without the benefit of pre-school training. A drive must be initiated to try to achieve universal attendance at the pre-school level.

1.3 Rationale

Infant and child mortality rates are basic indicators of a country's socio-economic situation and quality of life, as well as specific measures of health status. Measures of childhood mortality are also useful in population projections and monitoring and evaluating population and health programmes and policies (GSS, National Analytical Report on the 2010 Population and Housing Census).

Characteristics of childhood mortality such as child size at birth, place of delivery, antenatal care attendance and socio-economic and demographic differentials are used to highlight factors that have positive or negative impacts on child survival. Analysis of mortality measures is useful in identifying promising directions for health programmes and improving child survival efforts in Ghana (GSS, 2009).

The aim of the research is to improve childhood survival, through improved access to education and secondly encourage females to progress at least to the secondary level. The study would also show whether the country is on track towards meeting the MDGs goals two, four and five.

1.4 Research question

Although the estimates show improved child survival, and expectation of life at birth increased over the last two decades, the rates appeared to be relatively high compared with infant mortality rates of between 20 and 40 per 1,000 live births and between 25 and 50 deaths per 1,000 under-five mortality in some African countries. For instance, Cape Verde and Namibia had infant mortality rates of 19 per 1,000 live births and 36 per 1,000 live births respectively in 2011 (Population Reference Bureau, 2011). The results also showed that the indices were high in rural areas and in the three regions in the northern part of the country.

The relationship between mothers' education level and child survival may also be a factor in explaining the relatively high infant and under-five mortality in the three northern regions. Over half of females aged 6 years and over in these three regions had never attended school.

This research would therefore mainly seek to find out whether there exists an association between mothers education and child survival. Other socio-economic factors that are influenced by education to impact on child survival would also be looked at.

1.5 Objectives

With this background information, general objective of this research is to investigate the relationship between mothers' education and child survival in Ghana. Particularly, the study would look at the impact of mother's educational attainment on child

survival based on data obtained from the 2008 GDHS dataset, and then make conclusions based on the research.

According to the 2008 GDHS survey results, child and childcare related variables are linked to women's educational level. For example, almost all mothers with at least some secondary education receive prenatal care services from a health professional, compared with 94 percent of mothers with primary or no education.

1.6 Organization of the study

The study is made up of seven chapters. Chapter one introduces the research work and is made up of background of the study, problem statements and objectives of the study. Chapter two deals with the literature review of existing and similar research work. It would also look at the conceptual framework and statements of hypotheses. The third chapter would look at data sources, limitations and methodology. Country profile, data description, analysis of data would be handled in chapter four. Chapter five looks at the associations between child survival and the socio-economic variables of interest. Chapter six studies how education and other variables determine child survival in Ghana. The last chapter, chapter seven, would summarize research findings, conclude and then make recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Child survival is an important indicator of a nation's socioeconomic welfare. Infant and child mortality rates are very high in less developed countries (LDC). Works on infant and child mortality show that mortality is studied during two epochs, neonatal and post-neonatal. Neonatal mortality is death occurring in the first month of life and is basically linked with events about the neonatal periods and the infant's delivery. The highest risk for infant death is in the neonatal periods because of asphyxia (23%), severe infections (26%) and pre-term birth (28%). In addition, Post-neonatal deaths are attributed mostly to environmental, socio-economic, demographic and other factors (Muluye, 2012).

Many authors have proposed the use of frameworks and models for studying and predicting the determinants of child survival and development in developing countries. Mosley and Chen (1984) were the first to develop an analytical framework for the study of the determinants of child survival in developing countries. Van Norren (1986) also proposed an intermediate variables model for studying the effects of primary health care interventions. Victora and colleagues also recommended the use of conceptual frameworks in the analysis of complex hierarchical inter-relationships of determinants of disease. The conceptual framework proposed by UNICEF (2010) as part of its Nutrition Strategy framework recognizes that there are many possible causes of child malnutrition and that solving such malnutrition problems requires a proper understanding of the importance of the various different causes, otherwise attempted solutions are likely to fail.

Researchers in demography make clear differences between exogenous/socioeconomic (cultural, social, economic, community and regional factors) and endogenous/biomedical factors (breastfeeding patterns, hygiene, sanitary measures and nutrition). The effects of the socioeconomic variables are considered indirect because they operate through the biomedical factors. Biomedical factors are called intermediate variables or proximate determinants because they constitute the middle step between the socioeconomic variables and child mortality. The Cox proportional hazard analysis of the determinants of infant mortality in Ethiopa (a study based on the 2005 EDHS data) identified "breastfeeding status", "mothers age", "mothers level of education", "child birth order", "sources of drinking water" and "sex of infant" as significant predictors of infant mortality (Muluye, 2012). The effect of income on infant and early childhood mortality level in Egypt was studied by incorporating socioeconomic and demographic variables (Casterline, 1989). Relationships of some socioeconomic factors such as mother's educational level, partner's education, and place of residence (urban/rural) as well as economic status, ethnicity and sex of a child was studied in Tanzania (Mturi AJ, 1995). Another study in Tanzania investigated the effects of demographic, socioeconomic, health seeking behaviour and household environment on aggravating or impeding child mortality (Schellenberg et. al., 2002). The relationship between infant and child mortality and birth interval, age of a mother at the time of giving birth, birth order, with and without controlling for other relevant explanatory variables was studied in Malawi (Som and Manda, 1999). The effects of biological factors such as mother's age, and factors related to health service provision such as tetanus injection and use of antenatal services on infant mortality was examined based on data from Andre Pradesh, India (White H., 2003). A study of three age-specific (neonatal, infant and under five)

mortality by location (rural/urban), mother's educational attainment, religious affiliation, income status, and access to basic environmental services (water, sanitation and electricity), was done in Ethiopia (Wang L., 2003).

The importance of mothers' education for child survival through pathways other than enhanced socioeconomic status was brought into focus by Caldwell's (1979) similar paper on Nigeria. The paper argued that education of women played an important role in determining child survival even after control for a number of other factors, including socioeconomic characteristics of the husband, as his educational level and occupation. Caldwell (1979) suggested several pathways whereby mothers' education might enhance child survival. In increasing probable order of importance (according to Caldwell) these were: a shift from 'fatalistic' acceptance of health outcomes towards implementation of simple health knowledge; an increased capability to manipulate the modern world, including interaction with medical personnel; and a shift in the familial power structures, permitting the educated woman to exert greater control over health choices for her children.

Researchers have included a causal role for education in theoretical health production and health demand models in two different ways. A number of researchers have postulated that more educated mothers may produce better health because they are in the position to combine health inputs more efficiently (Kenkel, 2000, Goldman and Lakdawalla, 2002, Glied and Lleras-Muney 2003). For instance, more educated mothers may buy the right amount of preventive care by visiting doctors regularly that more effectively mitigates serious illnesses. Similarly, when educated women bear children, they may consciously use less harmful consumable goods like tobacco or

alcohol, because the negative externalities associated with the consumption of those goods raise what it costs to produce a surviving child. This causal pathway has been given the label "allocative efficiency." Other researchers have posited that education directly affects the amount of health a woman can produce with a given set of inputs (Grossman 1972a, 1972b, 2000). A more educated woman might produce more health, increasing survival opportunity, from a given set of inputs if, for example, her education taught her what combinations of food yield the most nutrients. Similarly, more educated women might produce more health from given inputs because their education makes it more likely that they carefully follow the treatment plan that doctors prescribe. This causal pathway has been given the label "productive efficiency."

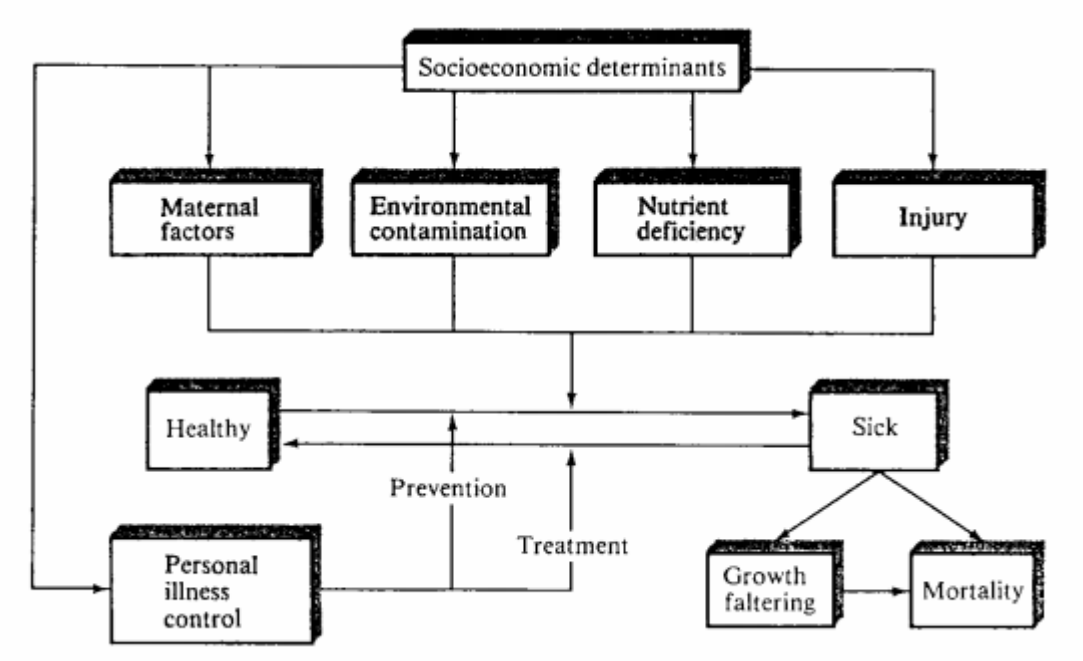
These two pathways are easily incorporated into extensions of Grossman's (1972) health production model used by Blunch (2005), Gilleskie and Harrison (1998) and Kennedy (2003). This simple model fails to include other possible channels through which education may affect child health, which determines child survival, input allocation. For example, the model does not include the possibility that more educated women may get access to more resources because they are able to marry spouses who are also educated. This model do not also show how education alters fertility decisions (directly or through income effects) as in quantity-quality models of fertility which suggests that the changes in income induce a shift in mother's preference from quantity to quality of children (Becker 1960, Becker 1991, Becker and Lewis 1973, Behrman and Rosenzweig 2002, Angrist, Lavy and Schlosser 2005). In those models, women with more education want fewer but higher quality children because the opportunity cost of her time increases as her education increases.

2.2 Conceptual framework

This research applied a new analytical framework for the study of the determinants of child survival in Ghana. The approach included biological as well as social variables and also put together research procedures applied by both medical and social scientists. This framework, grounded on the idea that all socio-economic determinants of child mortality go through collective set of biological mechanisms to produce an effect on mortality. Also, this framework provides for the measurement of mortality one variable (i.e. whether a child survives or died).

Usually, research in social science on child mortality centered on the association between levels and patterns of mortality, and socio-economic status is presented as shown in figure 2.1. The bases for the development of this approach in studying child survival are:

Figure 2.1: Proximate determinants model of health dynamics of a population.



Source: Mosley and Chen (1984), Page 29.

The key to the framework is the identification of a group of close determinants that affect the risk of mortality as well as morbidity directly. Therefore, all socio-economic determinants must work through these variables to influence child survivorship.

The close determinants are classified in five as follows: maternal factors (age, parity, birth interval); environmental contamination (air, food, water, finger, skin, soil, inanimate objects, insect vectors); nutrient deficiency (calories, protein, micronutrients-vitamins and minerals), injury (accidental, intentional); and personal illness control (personal preventive measures, medical treatment).

The framework, as depicted in Figure 2.1 shows how these proximate determinants work on the health dynamics of a population. The rate of movement of a healthy individual toward sickness is influenced via all the first four groups of the proximate determinants. The personal illness control factors influence both the rate of illness and the rate recovery. Particular states of sickness are transient: basically, there is either full recovery or permanent consequences manifested by increasing level of permanent growth inhibition and or death.

This conceptual framework is able to define a specific disease state in a person as an indicator of the working of the close determinants rather than the cause of illness and death. This does not imply that etiology-specific grouping of disease and death for the development of prevention and sensible intervention is of no use. Instead, the objective is to relate the social and the medical roots of the pertaining issues. This is the approved way of epidemiology, beginning with a biological issue in the host and then looks for its socio-economical determinants in a quest to frame acceptable control means. Implied by this model is the premeditated methodology to research on

child survival paralleling methods applied in the epidemiology of lasting diseases than the acute ones. Chronic diseases like heart diseases are usually multifaceted in causes with long gestation time, and are impacted by socio-economic settings and way of life.

2.2.1 *Dependent variable*

Social scientists often study mortality as the dependent variable, because deaths are substantive events that may be measured and aggregated with much ease, but dwelling mainly on mortality limits our research, because deaths do not occur always. Therefore mortality measurement needs the study of large populations or the aggregation of the mortality experience of smaller population for several periods. For social scientists the health status of survivors does not matter much. This is not so for medical scientists who usually study the disease or nutritional status of survivors. Though this process allows deeper studies of smaller population, disadvantage here is that past deaths cohorts being studied not quite often considered. So then, how do scientist account for deaths among the living into a single index of the health status of a population. The Proximate determinants model, described above put together the level of growth haltering among survivors with the level of mortality of the corresponding birth cohort to form an index distinctively.

2.2.2 *Proximate determinants*

For maximum analytical value, the intermediate determinants should serve not only as indicators of the different pathways causing mortality. Directly or indirectly, proximate determinants can be determined, and also via researches based on population study.

2.2.3 *Socio-economic determinants*

The social and economic variables that work through close determinants that directly affect the level of growth faltering and mortality are categorized as: individual-level variables (individual productivity of mothers and fathers), traditions/norms/attitudes; household-level variables (income/wealth); community-level variables (ecological setting, political economy, health system).

The analytical framework applied here is to study child survival by improving our understanding of the several factors involved in the household's production of children in good health to provide grounds for making policies in the right direction. The importance of the proximate determinants model is not in the multiplicity of interest but has the main advantage of organizing different measures of environmental settings, health care practices, diseases, dietary and reproductive states into a logical model which link one to the other and to child survival on the one hand and to socio-economic factors on the other hand.

This applied analytical model directs that child mortality should be studied more as a continuing disease process with multiple causes than as a severe occurrence by a causal agent. Therefore, using this model should improve specification of the several levels of causality and possible interplay among the socio-economic determinants.

On account of the comprehensive nature of the proximate determinants frame work described above, this study would analyze the impact of demographic, socioeconomic and environmental variables on child survival based on data from GDHS of Ghana, 2008.

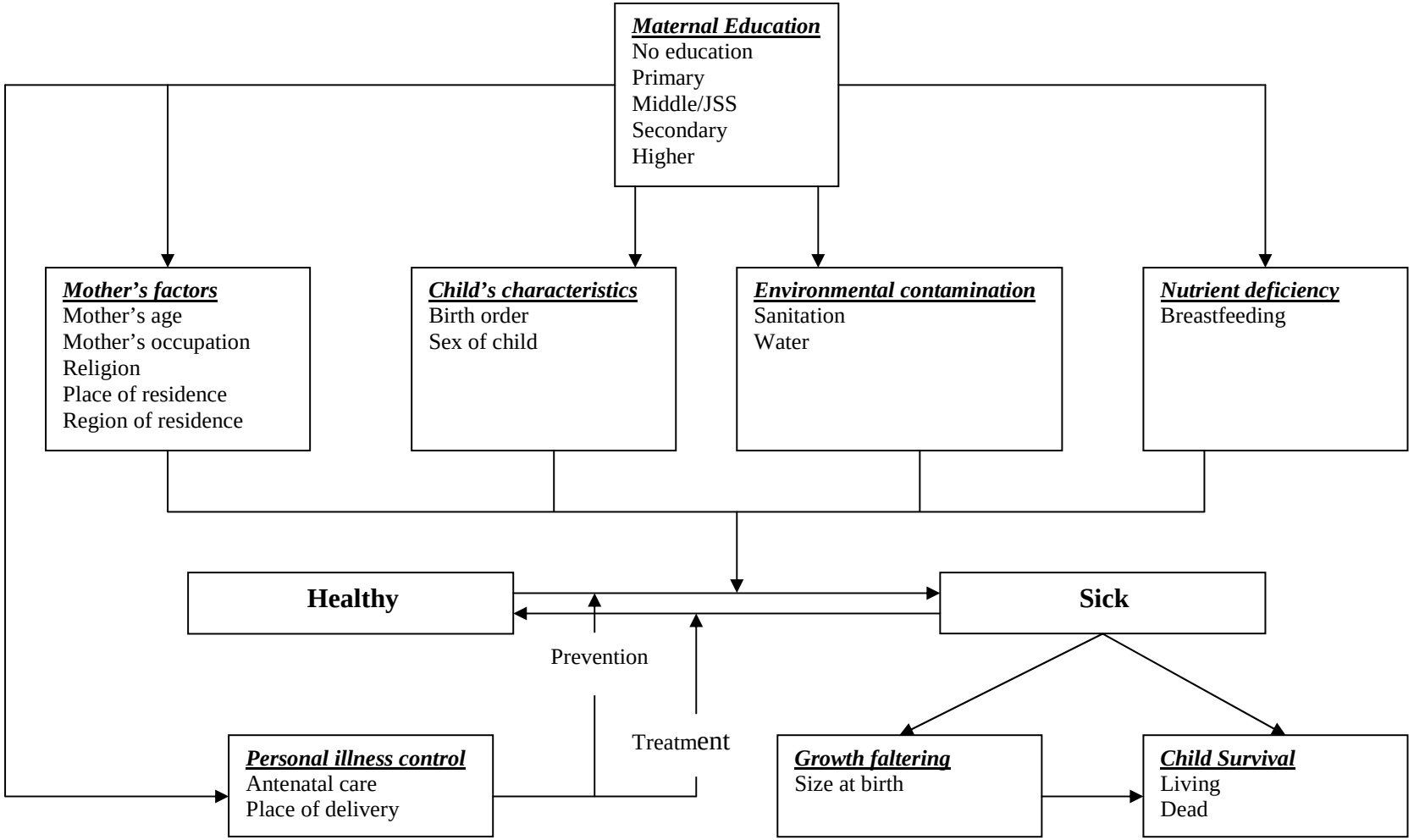
2.2.4 Adopted conceptual framework for the study

This framework is the most comprehensive and systematic model for analyzing infant and child mortality. According to the Mosley-Chen framework, socio-economic factors at the community, household or individual level operate through proximate determinants of health to influence the level of infant and child mortality. The proximate determinants represent underlying mechanisms that influence the disease process. They include maternal fertility factors, environmental contamination, nutrient deficiency, injury and personal illness control, and are the pathway through which socio-economic processes affect infant health.

From available literature, there are several indicators of child survival but this study would find out how maternal education impacts on child survival through selected socio-demographic variables.

Figure 2.4 shows the conceptual framework on which the quantitative analysis of this research would be based. The framework builds on the earlier conceptual models of the proximate determinants model of health dynamics of a population, with modifications based on the limitations and uniqueness of the data set. As in the case of the original model, there are many variables through which background factors must operate to influence survival chances. For instance in the above model the background characteristics indirectly and directly influence child survival, measured through breastfeeding, place of delivery and number of antenatal visits.

Figure 2.2: Model framework for the study of the maternal education and child survival.



Source: Adopted by author from the Proximate Determinants Model of health dynamics of a population by Moseley and Chen (1984).

The framework as explained in figure 2.4 used the socio-economic factors which include following characteristics at the:

Individual level: antenatal care, birth conditions, and early nutritional status have a large impact in later stages of life. Birth order and the time between births are also of relevance. One of the most powerful predictors of health status is the occurrence and length of breast feeding.

Household level: parental resources have important implications for child survival. A mother's educational level may influence child survival through his productivity, resulting in higher wages and a higher level of family consumption. Also, mother's education may increase her productivity in child care if she practices more effective preventive and curative health care; the quality of housing (floor and wall material, electricity), the level of crowding and access to water and sanitation determine exposure to environmental contaminants.

Community level: community level differences in access to resources, including access to health care, influence parents' ability to provide health care for their children. In some countries, these differences manifest themselves in terms of regional and urban/rural differences in the infant mortality rate (IMR). Cultural differences between regions may also influence the survival chances of male and female children.

The proximate determinants of health used in the model include:

Maternal factors: age, occupation, religion, place of residence and region of residence; Environmental contamination: water and sanitation; Nutrient deficiency: duration of breastfeeding; and Personal illness control: Antenatal care, and place of delivery.

2.3 Hypothesis

The study seeks to test the following hypothesis.

Hypothesis

Children of mothers with higher education are more likely to survive as compared to children of mothers with no education.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter looks at the available sources of data, the analysis method used as well as any identified limitation in the data used. As the main focus of this research is on education and child survival, more specifically, mother's educational level and child survival, and it examines on the basis of observed data on maternal-education and child survival in Ghana five years prior to the survey. Available data should be able to provide indication of the mechanisms through which maternal education can help reduce child mortality, relative importance of general education and health education for children's survival or health, maternal education as a strategy for children's survival or health, and the extent to which the function of maternal education can help reduce child mortality. However, maternal education is an intertwined factor, and hence may account for other variables that represent socio-economic conditions as well.

This work follows a single line of inquiry of separate models. The first model would find out whether formal education has impact on child survival. The second would look at the impact of education and intermediate variables on child survival. A final model educational effects controlling for other socio-economic variables on child survival. The framework applied builds on the earlier conceptual models of Mosley and Chen (1984) and van Norren and Van Vian (1986), with modification based on the limitation and uniqueness of the GDHS 2008 and the 2010 PHC dataset. Based on the framework, the background and socioeconomic factors, maternal education would be studied, identifying how they determine child survival chances.

3.2 Data Sources

Data for the study were obtained from the 2008 Ghana Demographic and Health Survey. The Ghana Demographic and Health Survey (GDHS) is a national survey covering all ten regions of the country. The survey was designed to collect, analyse, and disseminate information on housing and household characteristics, education, maternal health and child health, nutrition, family planning, gender, and knowledge and behaviour related to HIV/AIDS. It included, for the first time, a module on domestic violence as one of the topics of investigation.

The 2008 GDHS is the fifth demographic and health survey to be undertaken in Ghana since 1988. All five surveys have been implemented by the Ghana Statistical Service of Ghana, in close collaboration with other stakeholders in various sectors of government, researchers, civil society organisations, and international organisations. The planning and implementation of the survey was carried out jointly by the Statistical Service and the Ministry of Health/Ghana Health Service management team. The survey is designed to provide information to monitor the population and health situation in Ghana as a follow-up on the 1988, 1993, 1998 and 2003 GDHS surveys. The survey used a two stage sample based on the 2000 Population and Housing Census to produce separate estimates for key indicators for each of the ten regions in Ghana. The GDHS 2008 household sample of more than 12,000 households which is large enough to provide a sampling frame for conducting case-specific child mortality surveillance for children under five years using a Verbal Autopsy Questionnaire. Each household selected for the GDHS was eligible for interview with the Household Questionnaire, and a total of 11, 778 households were interviewed. In half of the households selected for the survey, all eligible women age

15-49 and all eligible men age 15-59 were interviewed with the women's and Men's Questionnaire, respectively (GSS, 2009).

3.3 Sampling Design

The 2008 GDHS was a household-based survey, implemented in a representative probability sample of more than 12,000 households selected nationwide. This sample was selected in such a manner as to allow for separate estimates of key indicators for each of the 10 regions in Ghana, as well as for urban and rural areas separately. The first stage involved selecting sample points or clusters from an updated master sampling frame constructed from the 2000 Ghana Population and Housing Census. A total of 412 clusters were selected from the master sampling frame. The clusters were selected using systematic sampling with probability proportional to size. A complete household listing operation was conducted from June to July 2008 in all the selected clusters to provide a sampling frame for the second stage selection of households. The second stage of selection involved the systematic sampling of 30 of the households listed in each cluster. The primary objectives of the second stage of selection were to ensure adequate numbers of completed individual interviews to provide estimates for key indicators with acceptable precision and to provide a sample large enough to identify adequate numbers of under-five deaths to provide data on causes of death. Data were not collected in one of the selected clusters due to security reasons, resulting in a final sample of 12,323 selected households. Weights were calculated taking into consideration cluster, household, and individual non-responses, so the representations were not distorted. Each household selected for the GDHS was eligible for interview with the Household Questionnaire, and a total of 11,778 households were interviewed. In half of the households selected for the survey, all

eligible women age 15-49 and all eligible men age 15-59 were interviewed with the Women's and Men's Questionnaires, respectively. A total of 4,916 women age 15-49 and 4,568 men age 15-59 from 6,141 households were interviewed. Data collection took place over a three-month period, from early September 8th to late November 25th 2008. This work considered all children born to women five years prior to the survey, with a total sample size of 2099.

3.4 Method of analysis

3.4.1 Categorization of data

This section deals with how the dependent, independent, intermediate and control variables were categorized and measured in the study.

Child survival is the dependent variable to be measured. The question asked in the survey to determine whether child survived or died was "is child alive" and this represents the last child before the survey.

Education in the independent variable to be measured using level of education and the question asked in the study was "what is the highest level of school attended".

Antenatal visits, place of delivery as well as breastfeeding practices were the intermediate variables used for the study. Antenatal visits were measured by asking whether the mother visited a health facility before delivery and the number of visits recorded. The variable, place of delivery measures whether the mother gave birth at a health facility or not. Breastfeeding status would measure whether the last child was breastfed or not.

Control variables used in the study are: mother's age, occupation, religion; place of residence and region of residence form the mothers characteristics; child size at birth, birth order, all related to the child; household sanitation and household water, and all grouped as characteristics of the household.

Childhood mortality estimates in demographic and health surveys measure the risk of dying from birth through age five. Under-five mortality (5q0) is the probability of dying between birth and exact age five. All rates are expressed per 1,000 live births, except child mortality, which is expressed per 1,000 children surviving to age 12 months.

The information used to measure these childhood mortality rates was collected from the birth history section of the Women's Questionnaire. Women of reproductive age (15-49) were asked a series of questions including, the number of biological sons and daughters living with them, the number living elsewhere, and the number who have died. In addition, for each live birth, women were asked to provide information on the sex, date of birth, whether the birth was single or multiple, and the survival status of the child.

3.4.2 Data analysis

The data for the study were analyzed with SPSS version 16, for descriptives as well as inferential statistics particularly significance testing, employing the univariate and bivariate techniques. The univariate techniques would consist of inferential statistics exploring the demographic characteristics of the respondents: the relationship between the response variable and each independent variable is explored with

bivariate techniques using cross tabulations. Binary regression models were used to find out the relationship between the dependent variable, the independent variables and the intermediate variables using logistic regression model. This model was applied because it is able to show the likelihood of an event occurring or not occurring. The study is looking at the influence of maternal education on child survival in Ghana.

The dependent variable, child survival, can be measured using many variables but his study would focus mainly on exclusive breastfeeding (including early initiation of breastfeeding), place of delivery, and prenatal care due to limited time.

3.5 Data Limitations

3.5.1 Errors in data set

Estimates derived from a sample survey are affected by two types of errors: 1) non-sampling errors, and 2) sampling errors. Non-sampling errors are the results of mistakes made in implementing data collection and data processing, such as failure to locate and interview the correct household, misunderstanding of the questions on the part of either the interviewer or the respondent, and data entry errors. Although numerous efforts were made during the implementation of the 2008 Ghana DHS (GSS, 2009) to minimize this type of error, non-sampling errors are impossible to avoid and difficult to evaluate statistically (GSS, 2009).

These inherent mistakes or errors may reduce the true representation of information collected. This, in addition to insufficient data transformation techniques applied may affect the analysis and further negatively influence the expected results.

Sampling errors, on the other hand, can be evaluated statistically. The sample of respondents selected in the 2008 GDHS is only one of many samples that could have been selected from the same population, using the same design and expected size. Each of these samples would yield results that differ somewhat from the results of the actual sample selected. Sampling errors are a measure of the variability between all possible samples. Although the degree of variability is not known exactly, it can be estimated from the survey results (GSS, 2009).

3.5.2 Data quality

Whether the data capture child survival well or not depends on the reliability of mortality estimates which also depend on the sampling variability of the estimates and on non-sampling errors. Non-sampling errors arise from problems associated with the quality of data collection and include the completeness with which births and deaths are reported and recorded.

The most common problems are misreporting of age at death, misreporting of dates of birth, and event underreporting (of both the birth and death of a child). A typical problem with survey data is the misreporting of infant deaths that occur in the late post-neonatal period, as well as deaths at 12 months or one year of age (digit preference in the reporting of age). Such misreporting results in underestimation of the infant mortality rates and overestimation of child mortality rates. Misreporting of the date of birth of children is common in many surveys that include both demographic and health information for children born since a specified date. The effect of such an error is to distort time mortality. Event underreporting is usually more severe for deaths that occur early in infancy. Omission of deaths may also be

more common among women who have had several children or in cases where the death took place a long time ago.

To assess the impact of omission on measures of child mortality, two indicators are used: the percentage of deaths that occurred under seven days to the number that occurred under one month, and the percentage of neonatal to infant deaths. It is hypothesised that omission will be more prevalent among children who died immediately after birth than among those who lived longer, and that omission will be more serious for events that took place in the distant past than for those in the recent past.

In addition to recall errors for the more distant retrospective periods, there are structural reasons for limiting mortality estimation to recent periods, preferably to the periods 0-4, 5-9, and 10-14 years before the survey. In fact, except for the first period (0-4 years), the others are slightly biased estimates because they are based on the child mortality experiences of women age 15-44 and 15-39, respectively, instead of women age 15-49 as in the period 0-4 years preceding the survey. Therefore, estimating mortality for periods more than 10-15 years before the survey is not advisable (GSS, 2008 GDHS report).

CHAPTER FOUR

BACKGROUND CHARATERISTICS OF RESPONDENTS AND CHILD SURVIVAL STATUS

4.1 Background characteristics of the study area

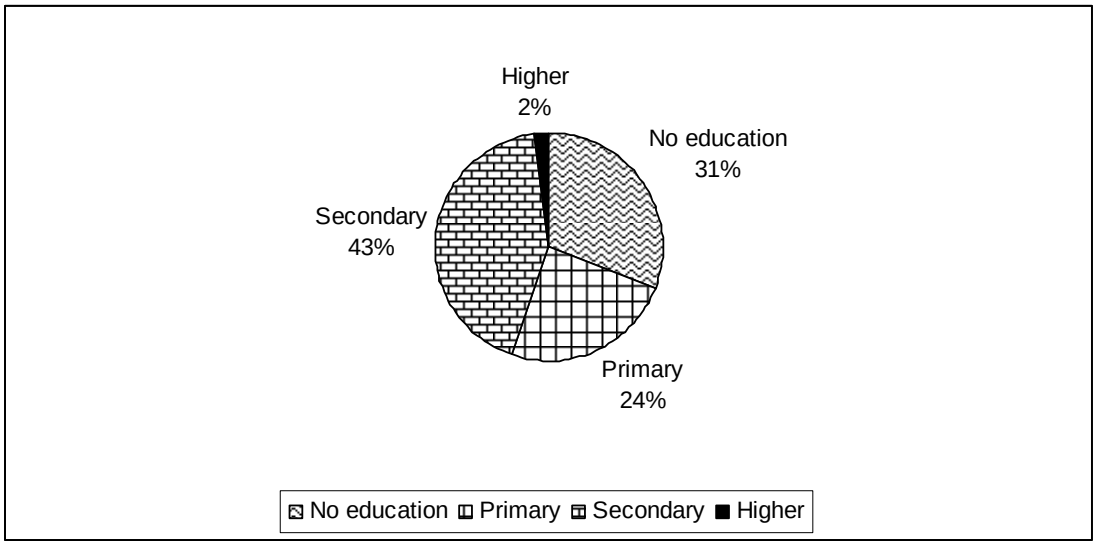
The basic characteristics of the sampled population, that is, age, sex, education, and place of residence and the socio-economic conditions of the households, form the basis of the background information by which most key demographic and health indices are analysed in the research. This information is important for the interpretation of key demographic and health indicators from which the researcher can propose meaningful policies and programmes for intervention.

Basic information on women in the reproductive age group is crucial for the interpretation of the 2008 GDHS findings on maternal educational level and child survival within the context of reproduction, health, and women's status. The main background characteristics described in detail that are used in the data analysis are: age of mother at the time of the survey, residence and education. Therefore the included variables exerting proximate biological influences are maternal educational level, mother's age, mother's occupation, mother's religion, mother's place of residence, mother's region of residence, child size at birth, birth order of last child, sex of last child, housing characteristics of mothers, breastfeeding, place of delivery and antenatal care.

4.2 Maternal educational level

Education provides people with the knowledge and skills that can lead to a better quality of life. Level of education has been found to be closely associated with the health of women and children, as well as reproductive health behaviours of women and therefore mothers as a whole (WHO, 2008).

Figure 4.1: Percentage distribution of highest educational level of mother.



Source: GSS, 2008 GDHS.

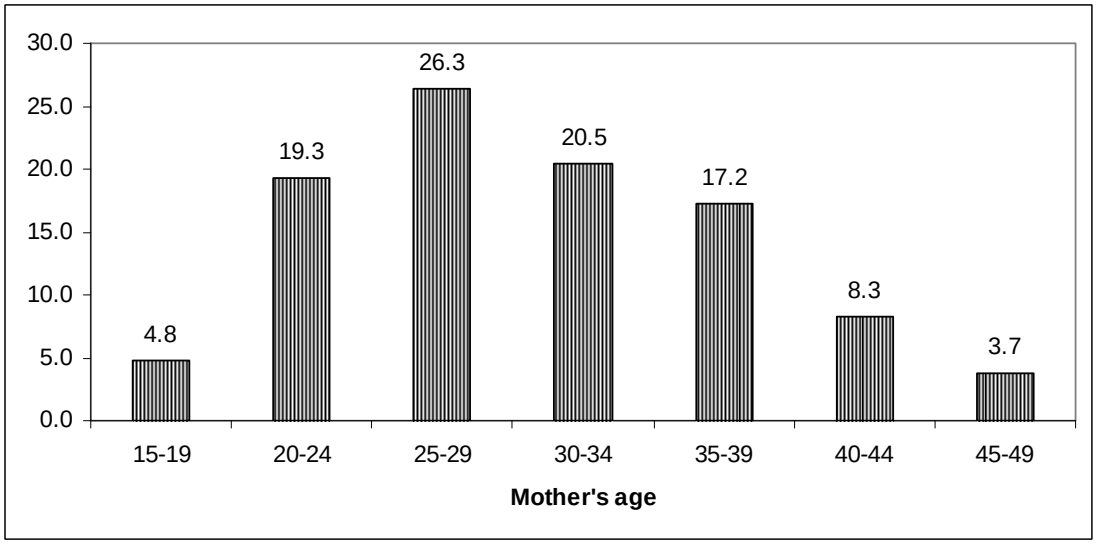
A mother's education is probably related to her knowledge of how to care for children and the quantity of time she spends with children, and hence may affect the quality of that time. Figure 4.1 shows the distribution of mothers by highest level of schooling attended or completed. Thirty-one percent of mothers interviewed have never been to school, 24 percent have completed primary education, 43 completed secondary school, and 2 percent have attained higher education. Drawing from the descriptions shown here, if the argument of the protective effect of the mother's education on child mortality is to hold then about 1 out 9 mothers would have their children not surviving before age five. This situation may then call for basic health education

approach because it takes a short time to pass on health information rather than general education which is time consuming.

4.3 Mother's age

Children of mothers in younger (less than 19 years) and older (45 years and older) ages show different mortality risks compared to those in their usual child bearing age. Young age may reflect maternal immaturity, while old age is linked with greater chance of birth challenges. Age may also measure a mother's experience with child care and may be related to the likelihood that the child is wanted. Figure 4.2 shows the distribution of mothers by 5-year age group.

Figure 4.2: Distribution of mother's age in 5-year groups.



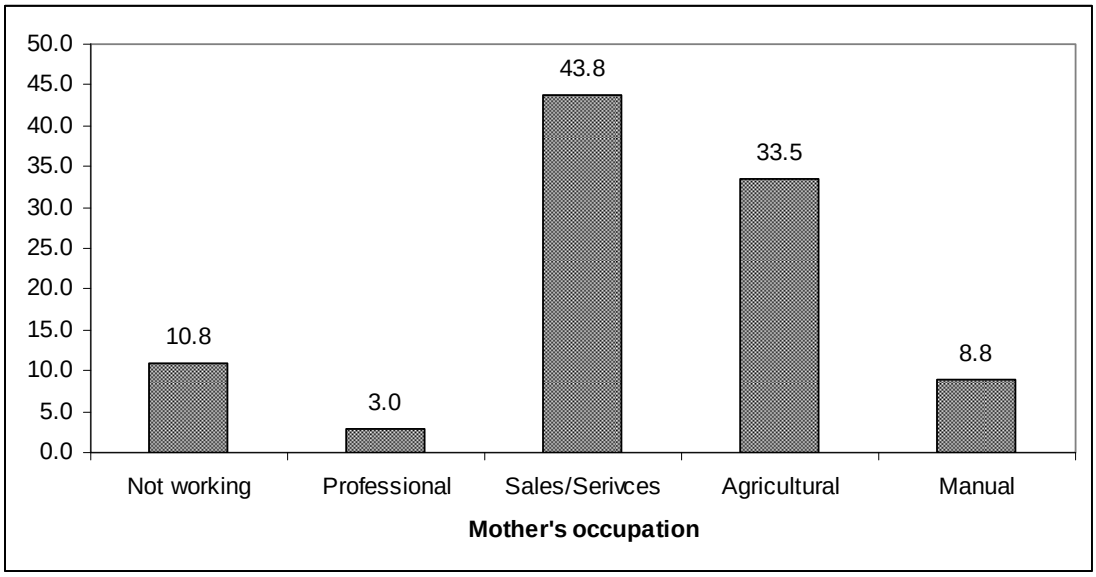
Source: GSS, 2008 GDHS.

The age distribution shows that about half of mothers interviewed (51 percent) are under age 30. The proportion of respondents in each age group generally decreases as age increases from the 25-29 age group reflecting the comparatively young age structure of the Ghanaian population prior to the survey.

4.4 Mother's occupation

Occupation of the mother is a measure of the work status and environment of the mother. These factors may affect contribution of home resourcefulness of the household to obtain improved health care (Tekce B., Shorter F., 1990). Figure 4.3 shows the distribution of occupation of mothers, where majority of the mothers are into sales and agriculture. About 10 percent of the mothers were not working, and therefore likely to apportion substantial amount of their time for caring for their children. Mothers in the professional, clerical, sale, and services are likely to fall on family and sometimes inexperienced care givers for caring of their young ones.

Figure 4.3: Distribution of mother's occupation



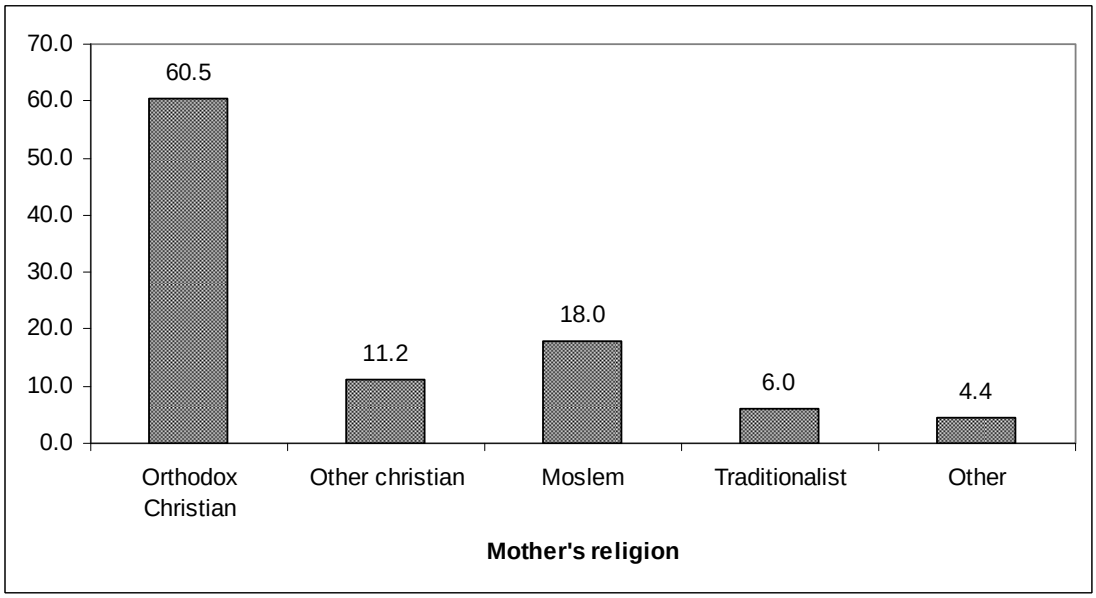
Source: GSS, 2008 GDHS.

4.5 Mother's religion

The distribution in Figure 4.4 shows that majority (60.0%) of mothers belonged to Orthodox Christian faiths including Catholics, Presbyterians and Anglicans. About 18

% of mothers were Moslems. A little over one-tenth of the mothers also belonged to other Christian affiliations including Charismatics.

Figure 4.4: Distribution of mother's religion

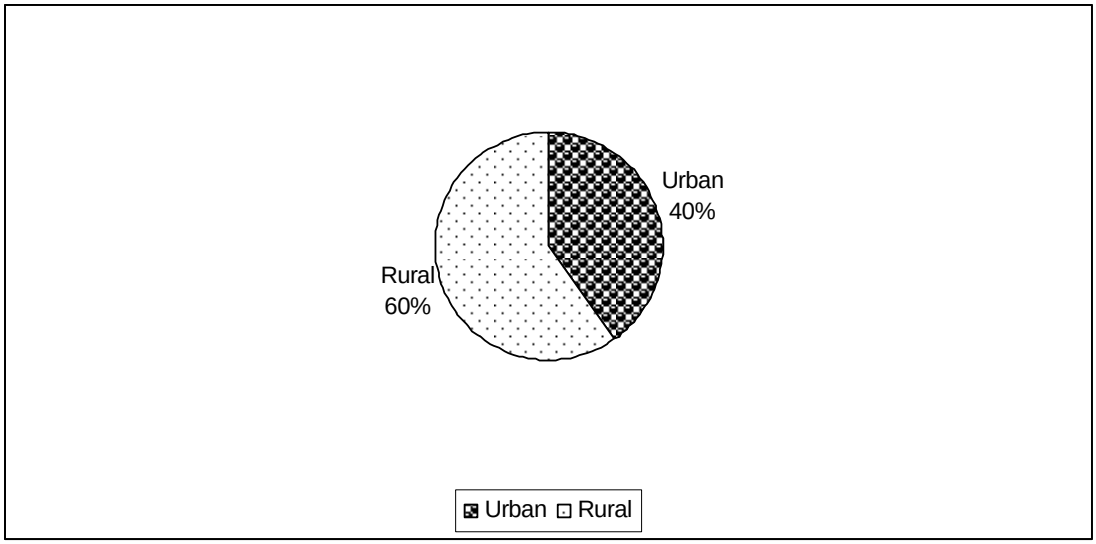


Source: GSS, 2008 GDHS.

4.6 Mother's place of residence

This measures the influence of unobserved factors that change with respect to whether the location of residence is rural or urbanized. The distribution of respondents by urban-rural residence shows that over half of mothers interviewed (60 percent) live in the rural areas as compared to 40 % in the urban areas (Figure 4.5). This observation is not peculiar to Ghana, the same situation exist in developing countries. For example, in a study looking at the determinants of infant mortality done in Ethiopia, of the 7,118 children, 6, 107(1,011) were born in rural (urban) areas.

Figure 4.5: Percentage distribution of type of place of residence.

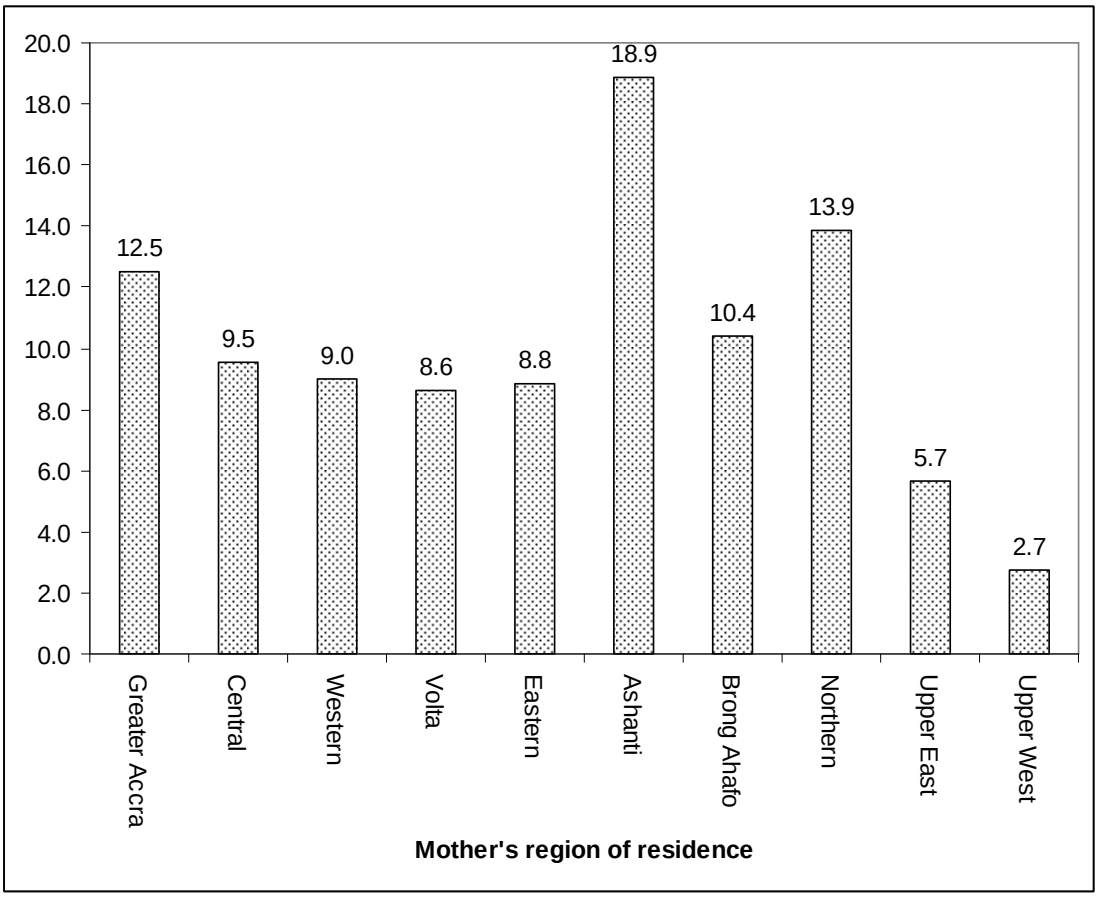


Source: GSS, 2008 GDHS.

4.7 Mother's region of residence

Close to one-fifth of the children were born to mothers residing in the Ashanti Region (Figure 4.6) which is the second most urbanized region in Ghana. The Upper West Region on the other hand had the lowest proportion of births (2.7%) among all the regions. The proportion of births reported in the Eastern and Volta regions were almost the same (Figure 4.6).

Figure 4.6: Distribution of mother's region of residence.



Source: GSS, 2008 GDHS.

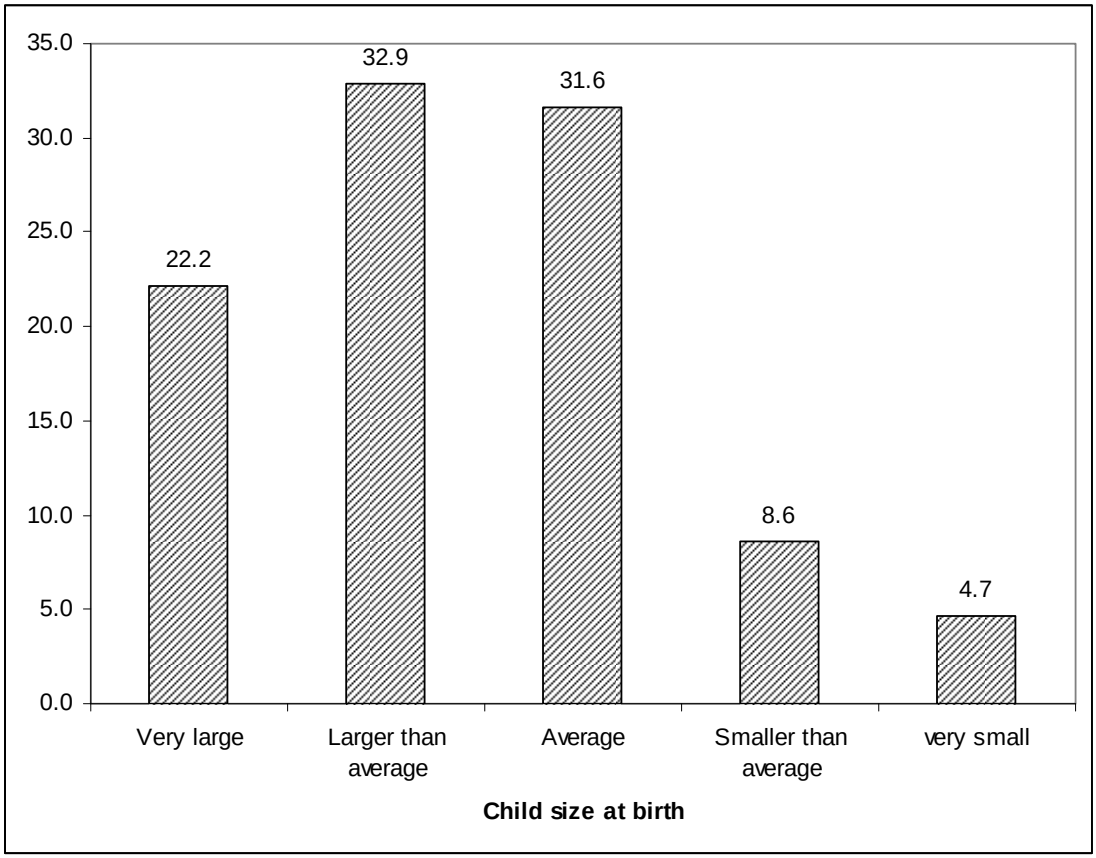
4.8 Child size at birth

Findings on child health from the 2008 GDHS look particularly on neonatal conditions (birth weight and size at birth), children's vaccination status, and treatment practices that are commonly used for children experiencing the three major childhood illnesses: acute respiratory infection (ARI), fever, and diarrhea. The information on children's birth weight and size, treatment practices, and contact with health facilities when children are sick paves the way to strategic planning and implementation of programmes to reduce neonatal and infant mortality. Combined with information on childhood mortality, this information can be used to identify subgroups of women and children who face increased risk because of non-use of Maternal and Child Health

(MCH) services, and to assist with planning effective improvements for these services.

Birth weight and size may allow for the strongest effects of very low birth size and the possibility of increased mortality for very large birth weight. Birth size reflects intrauterine pathology, prematurity, and ability to survive illness immediately after birth. It is also related to size later in infancy and hence ability to survive infectious illnesses in post-neonatal infancy. Figure 4.7 shows the distribution of child's size at birth.

Figure 4.7: Distribution of child's size of at birth.



Source: GSS, 2008 GDHS.

This distribution indicates that 22.3 percent of babies born are very large, 32.9 are larger than the average baby size at birth. About four percent of the babies born are extremely small and close to one percent don't know their weight.

4.9 Birth order of last child

In examining the association between birth order and child survival identifying other risk factors due to birth order, data were collected (i.e. 2000 GDHS dataset) to enable the researcher determine the birth order of the last child prior to the survey. Birth order is often treated as reflecting a biological mechanism. It may also reflect the likelihood that the child was wanted and the degree of competition for family resources. The distribution of birth order is shown in the Table 4.1.

Table 4.1: Percentage distribution of birth order number of last child

Birth order	Frequency	Percent
1	467	22.3
2	436	20.8
3	349	16.6
4	306	14.6
5	193	9.2
6	137	6.5
7 +	211	10.0
Total	2099	100

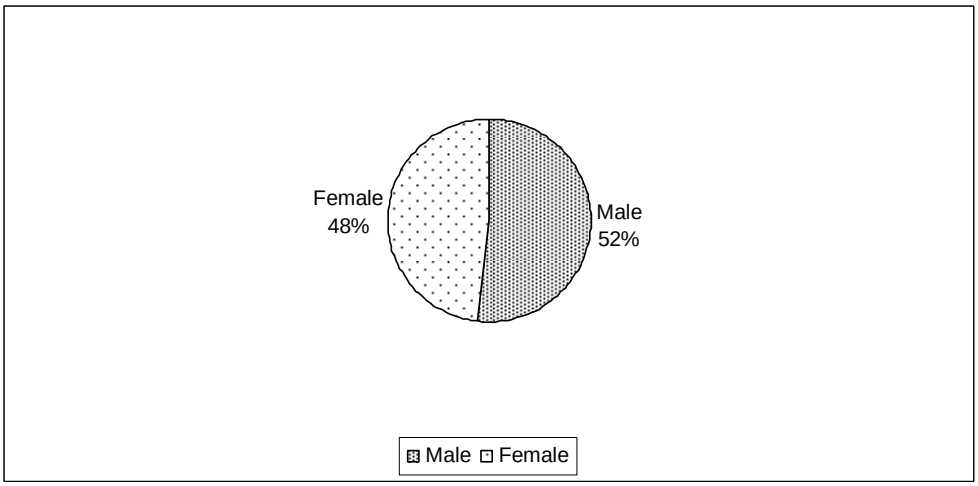
Source: GSS, 2008 GDHS.

Birth orders 1, 2, 3 (22.3%, 20.8%, 16.6%) account for majority of the distribution. Ten percent of the children were of birth order seven or higher.

4.10 Sex of last child

Gender shows inherent biological differences in survival chances. It also reflects treatment differentials of boys and girls due to the different value systems societies cherish.

Figure 4.8: Percentage distribution of sex of last child



Source: GSS, 2008 GDHS.

Figure 4.8 shows the total births prior to the survey 52 percent are boys survived as against 48% of the children who were girls. Other channels through which the status of women influences child survivorship is through the effect of sex preference on child care. Where there is a strong preference and need for sons, boys get preferential treatment in feeding and medical treatment (Rosenberg, 1973; Williamson, 1976).

4.11 Housing characteristics of mothers

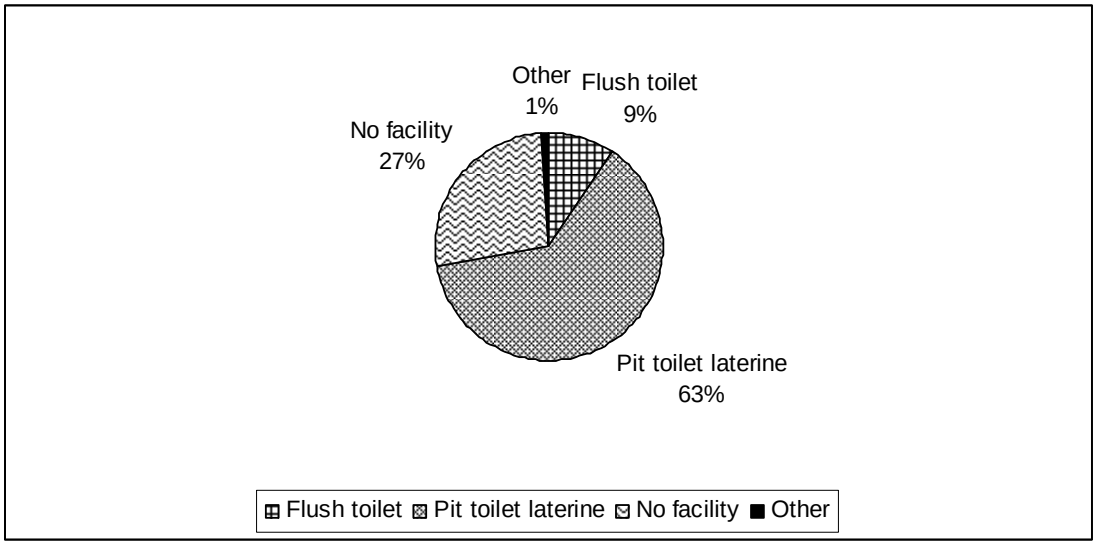
This section describes the environment in which mothers and children live. This description presents the general characteristics of the population, including housing facilities (sources of water supply and sanitation facilities).

There is a strong correlation between the socio-economic conditions of households and the vulnerability of its members, especially children, to common diseases. The amenities and assets available to households are important in determining the general socio-economic status of the population (GSS, 2009).

Types of household sanitation and water measure likelihood of exposure to gastrointestinal diseases through contaminated water. These are interacted with type and duration of breastfeeding in the analysis, because breast feeding, especially if not supplemented, reduces exposure to contaminated water.

The proportion of the population with access to improved toilet facilities, according to the WHO/UNICEF Joint Monitoring Programme (JMP), which is the UN officially mandated mechanism to monitor global progress in drinking water and sanitation (toilet facility), is the percentage of people using improved and sustainable toilet facilities.

Figure 4.9: Percentage distribution of type of toilet facility.



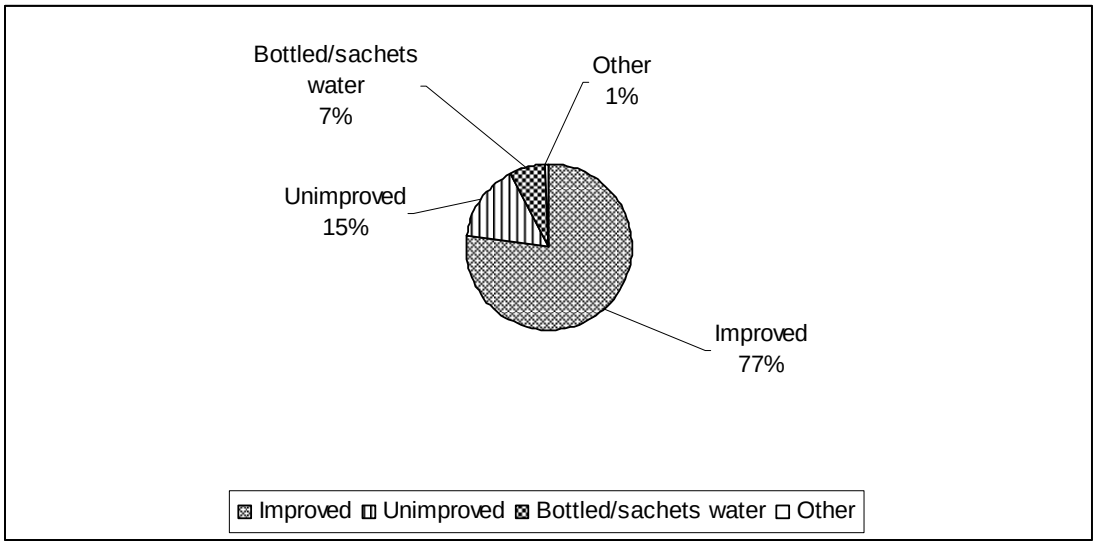
Source: GSS, 2008 GDHS.

An improved toilet facility is considered the most efficient and hygienic method of human waste disposal. Figure 4.9 shows the percent distribution of households by type of toilet facility.

Overall, only 9 percent of households use flush toilet. Majority of mothers interviewed are from households using pit toilet latrine. However, about one-third (27 percent) has no toilet facilities, a situation that is more common in rural areas than in urban areas.

The availability of and accessibility to improved drinking water may, to a large extent, minimise the prevalence of water-borne diseases among household members, especially young children. The source of drinking water is important because potentially fatal diseases, such as diarrheal diseases, guinea worm, bilharzia, typhoid, cholera, schistosomiasis, trachoma, and dysentery, are common in Ghana. Figure 4.10 shows the percent distribution of main sources of drinking water for the household interviewed.

Figure 4.10: Percentage distribution of source of drinking water.



Source: GSS, 2008 GDHS.

Overall, 77 percent of households obtain drinking water from an improved source (i.e. water that is piped into dwelling or yard, public tap or stand pipe, tube well, protected well, protected spring and rain water). Fifteen percent of households use unimproved water (i.e. unprotected well, river or dam, tanker truck and water cart with small tank), while 7 percent use bottled/sachet water. One percent of respondents use other sources.

4.12 Intermediate variables

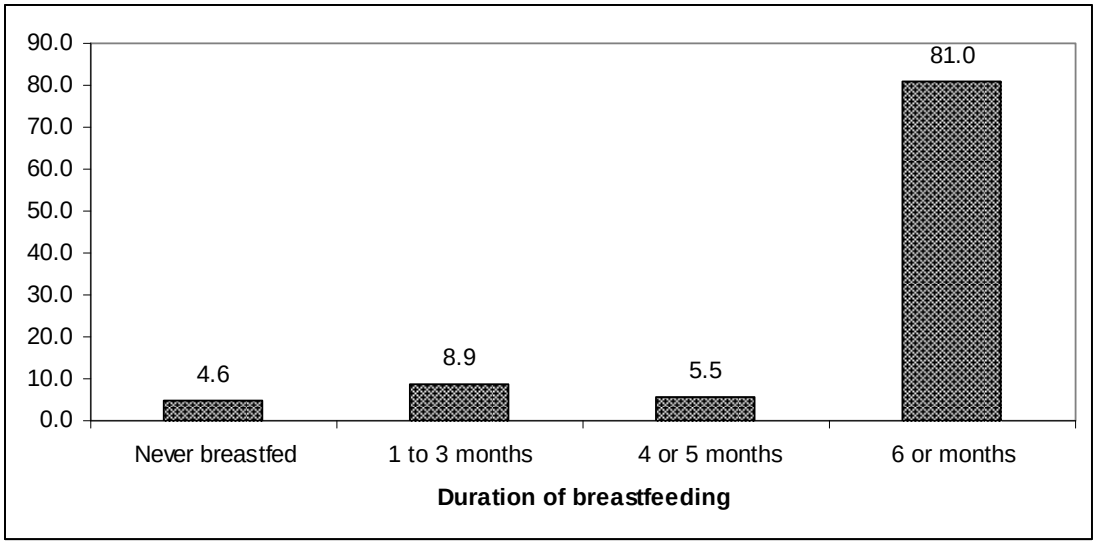
Although the ultimate cause of death is biological, the determinants of the child survival factors may be a chain of biological and behavioural factors (Butz and Habicht, 1976). A corollary is that behavioural factors do not affect mortality directly but rather through more biological correlates. Intermediate variables observed in this study are described below.

4.12.1 Breastfeeding

Duration of breastfeeding may measure nutritional intake. The extent of supplementation or substitution reflects the likelihood of ingestion of pathogens with breastmilk supplements or substitutes. Substitutes influence should depend on the quality of water and sanitation. Coverage on nutritional concerns for children as well as mother's is important. The 2008 GDHS collected information from respondents to evaluate the nutritional status of young children. Information on complementary feeding was obtained by asking mothers about the current breastfeeding status of all children under five years of age and—for the youngest child born in the three-year period before the survey and living with the mother—foods and liquids given to the child the day and night before the survey.

UNICEF (2010) and WHO (2008) recommend that children be exclusively breastfed during the first 6 months of life and those children be given solid or semi-solid complementary foods in addition to continued breastfeeding from 6 months until age 24 months or more when the child is fully weaned. Exclusive breastfeeding is recommended because breast milk is uncontaminated and contains all the nutrients necessary for children in the first few months of life. In addition, the mother's antibodies in breast milk provide immunity to disease. Early supplementation is discouraged for several reasons. First, it exposes infants to pathogens and increases their risk of infection, especially diarrhea diseases. Second, it decreases infants' intake of breast milk and therefore suckling, which reduces breast milk production. Third, in low-resource settings, supplementary food is often nutritionally inferior. Figure 4.11 gives the distribution of breastfeeding status of mothers.

Figure 4.11: Distribution of breastfeeding status of mothers.



Source: GSS, 2008 GDHS.

The result in Figure 4.11 shows that every 4 in 5 of the children were breastfed for six or more months as recommended by the World Health Orgnisation. The results also

show that about 5 percent of the children were never breastfed. About one-tenth children were breastfed for between one to three months.

4.12.2 Place of delivery

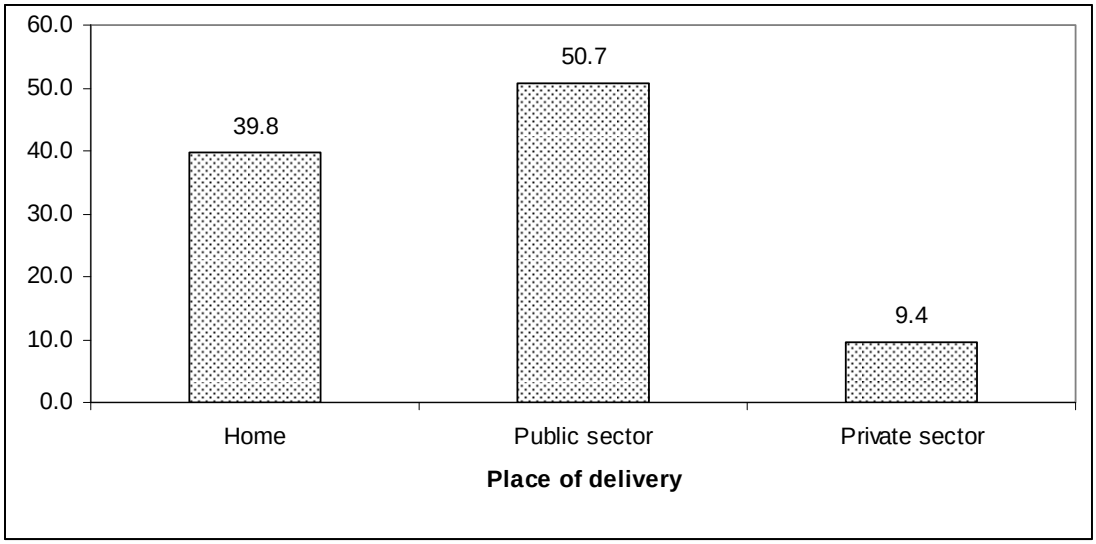
Delivery usually through labour is the shortest and important period of the pregnancy-childbirth process. Despite the best possible antenatal care, any delivery can become a complicated issue, therefore, skilled assistance is needed for safe delivery and care. Not all women seek skilled care even when they know the safety reasons for doing so. Distance to the health facility, quality of care and cost of service are some factors influencing mother's place of delivery.

In addition some place of birth may in the position to better manage birth complications or identify issues at birth that may cause mortality risk later. However, mothers may choose facilities they perceive give babies better care.

The introduction of free maternity health services and locating Community-based Health Planning and Services (CHPS) compounds closer to where people live are some of the efforts that have been made to remove barriers to accessing skilled maternity care. The CHPS compounds are manned by community health officers, some of whom are midwives or have midwifery skills to attend deliveries and make referrals should complications arise.

Respondents in the 2008 GDHS were asked to report the place of birth for the last child born in the five years preceding the survey. Figure 4.12 shows the percent distribution of live births in the five years preceding the survey by place of delivery, according to background characteristics.

Figure 4.12: Distribution of place of delivery of last child.



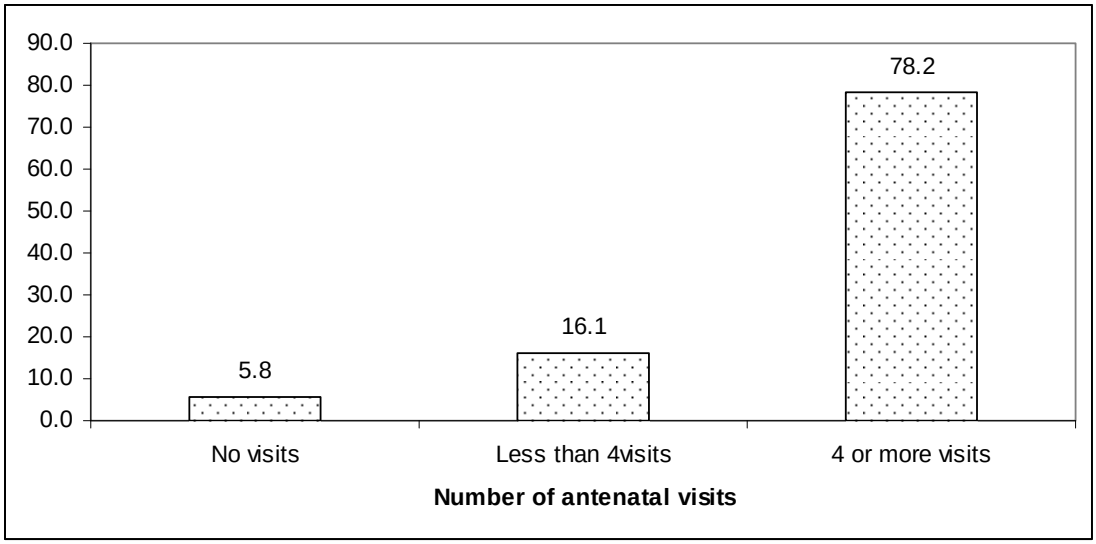
Source: GSS, 2008 GDHS.

Overall about 51 percent of births were delivered in public health facilities, accounting for the largest proportion; this is an increase since the 2003 GDHS (46 percent). Two out of every five mothers interviewed delivered at home, whereas roughly 9% went to private facilities for delivery. The high home delivery of babies may be attributed to lack of knowledge (or information) on basic health issues related to pregnancy, child birth and child care. It is expected that delivery facilities use increase with level of mother's education, the same pattern is seen by wealth status, where births in health facilities increase with increasing wealth quintile.

4.12.3 Antenatal care

The health care that a mother receives during pregnancy, at the time of delivery, and soon after delivery is important for the survival and well-being of both the mother and her child. Findings pertaining to frequency of antenatal visits are presented here. These findings are important for designing appropriate strategies and interventions to improve maternal and newborn health care services. The frequency of visits is shown in the Figure 4.13.

Figure 4.13: Distribution of number of antenatal visits.



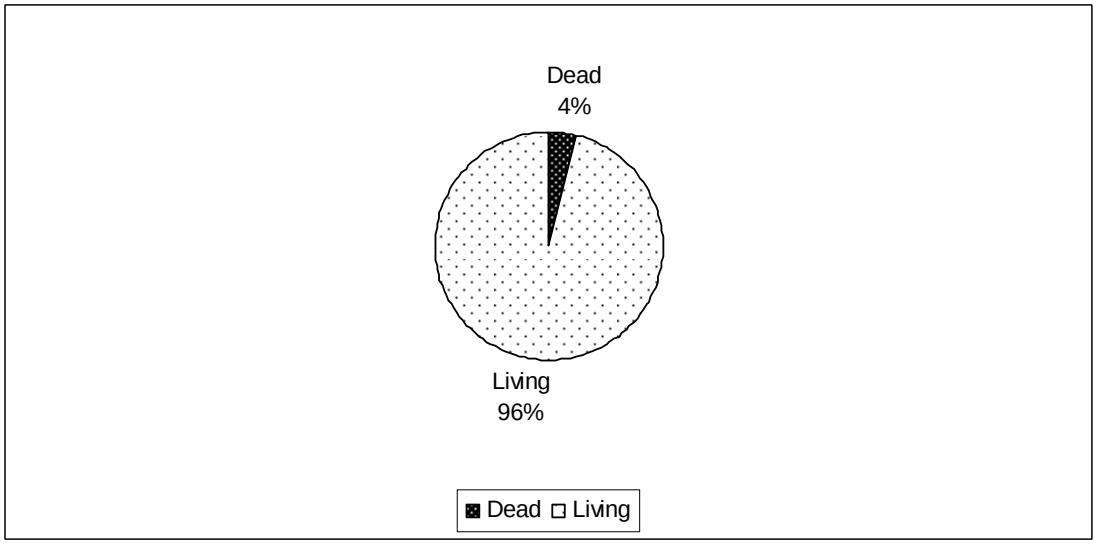
Source: GSS, 2008 GDHS.

Overall, roughly 78 percent of pregnant mothers had antenatal visits more than the recommended number of visits (i.e 4 or more visits). Roughly six percent of mothers who gave birth to their last child within 5 years prior to the survey never visited a facility.

4.13 Dependent variable

Current age, i.e age of child at the time of survey, was collected for living children, and age at death was collected for dead children. Mothers were asked “in what month and year was child born? (Sufficient probing was done to ascertain child birthday), whether alive or dead. If child is alive, mothers were asked “how old was child at his/her last birthday, otherwise, “how old was child when he/she died.

Figure 4.14: Percentage distribution of child survival status.



Source: GSS, 2008 GDHS.

Figure 4.14 represents under-five mortality in Ghana five years before the survey, indicating that of all children born within five years prior to the survey four percent died before reaching age five.

CHAPTER FIVE

ASSOCIATION BETWEEN SOCIO-DEMOGRAPHIC CHARACTERISTICS AND CHILD SURVIVAL

5.1 Introduction

In this chapter, the association between child survival and the demographic and the socio-economic variables of interest (education, breastfeeding, place of delivery, prenatal care , mother's age, child size at birth, household sanitation, household water source and locality of residence) is examined with child survival. This was done because child survival is affected directly or indirectly by these characteristics of the mother and the child. To assess the other factors' associated, the chi-square test statistic was used to determine if there is a significant difference between child mortality by the demographic and socio-economic characteristics.

5.2 Mother's educational level and child survival

Table 5.1 shows that the educational level of mothers is significantly associated with child survival (p=0.009), suggesting that the level of education attained by a mother influences the survival of her child.

Table 5.1: Association between mother's educational level and child survival

Highest educational level	Child is alive	
	No (%)	Yes (%)
No education	3.9	96.1
Primary	6.3	93.7
Secondary	2.7	97.3
Higher	2.0	98.0
Pearson Chi-Square= 11.53, p-value= 0.009		

Source: GSS, 2008 GDHS.

The results in Table 5.1 show that the proportion of child deaths was lowest among mothers with the highest level of education. Among mothers with primary education, 93.7% of their children survived while among those with higher education, 98.0 of their children survived.

5.3 Breastfeeding status and child survival

Breastfeeding also has an influence on the number of children surviving to mothers in Ghana. Table 5.2 shows a statistically significant association between breastfeeding and child survival (p value=0.000). While almost all children who were breastfed survived, half of their counterparts who were not breastfed died. The results suggest breastfeeding is protective of children, as the breast milk contains colostrum, which is strongly nutritious and has antibodies that protect the newborn from diseases (GSS, GDHS 2008)

Table 5.2: Association between breastfeeding and child survival

	Child is alive	
Breastfeeding status	No (%)	Yes (%)
Never breastfed	40.2	59.81
Breastfed for 1 to 3 months	4.3	95.7
Breastfed for 4 or 5 months	3.5	96.5
Breastfed for 6 or months	1.7	98.3
Pearson Chi-square=371.171 , p-valus= 0.000		

Source: GSS, 2008 GDHS.

5.4 Place of delivery of last child and Child survival

Association between place of delivery and child survival is not significant (p-value= 0.482), indicating that infant's institution of birth is not a significant determinant of

child survival. From literature, however, particular types of birth institutions may better able to handle birth complications or to identify conditions at birth that may increase mortality risk later (DaVanzo, 1984). As Table 5.3 show at least ninety percent of children survived irrespective of their place of delivery.

Table 5.3: Association between place of delivery and child survival

Place of delivery	Child is alive	
	No (%)	Yes (%)
Home	3.3	96.7
Public sector	4.3	95.7
Private sector	3.5	96.5
Pearson Chi-Square= 2.464, p-value= 0.482		

Source: GSS, 2008 GDHS.

5.5 Antenatal care and child survival

There is no significant association between the number of times a mother visits or attends antenatal and child survival (p-value = 0.129), contrary to what was found by Smucker et al. (1980) that with frequent antenatal visits a child has higher chance of surviving. However, there are notable differences in number of visits. The proportion of children who survived was highest among mothers who attended 4 or more visits (Table 5.4).

Table 5.4: Association between antenatal visits and child survival

Number of antenatal visists	Child is alive	
	No (%)	Yes (%)
No visits	6.6	93.4
Less than 4visits	4.7	95.3
4 or more visits	3.4	96.6
Pearson Chi-square=4.096 , p-value= 0.129		

Source: GSS, 2008 GDHS.

5.6 Mothers' age and child survival

The cross tabulation of mothers' age and child survival shows no significant association (p=0.189). This is however contrary to literature as it is expected that mothers' age at birth influences child mortality. For instance babies born to very young mothers (less than 19 years old) are much more likely to die in the first month of life as cited in DaVanzo (1983). Da Vanzo added in his work that, biomedical factors could lead to this association, but the effects of environmental and behavioural factors that might cause infant deaths to very young mothers would not normally show up until later in infancy. This can purely be due to biological causes. Similarly, babies born to mothers older than 40 years are also more likely to die in infancy, some also die in the neonatal stage, while others are concentrated in the second six months of infancy. The biological processes underlying this phenomenon are not known yet but many behavioural factors can be suspected (Da Vanzo, 1983).

Table 5.5: Association between mother age and child survival

Age of mother	Child is alive	
	No (%)	Yes (%)
15-19	1.0	99.0
20-24	3.7	96.3
25-29	2.9	97.1
30-34	4.0	96.0
35-39	4.4	95.6
40-44	5.8	94.2
45-49	7.7	92.3
Pearson Chi-Square= 8.743, p-value= 0. 189		

Source: GSS, 2008 GDHS.

Only one percent of babies born to mothers at very young age did not survive whereas 7.7% of children born to mothers aged above 45 died. Generally, more than 90% of

children across all ages survived, with minute differentials in survival chances irrespective of age of mother (Table 5.5).

5.7 Mothers occupation and child survival

The results show that a higher proportion of child deaths occurred among mothers who were not working compared to all other occupational categories. There was not much variation in child survival status among the different occupational categories of the mothers (Table 5.6).

Table 5.6: Association between mother's occupation and child survival

	Child is alive	
Mother's occupation	No (%)	Yes (%)
Not working	5.7	94.3
Professional	3.2	96.8
Sales/Services	3.6	96.4
Agricultural	3.8	96.2
Manual	3.2	96.8
Pearson Chi-square=2.599 , p-value= 0.627		

Source: GSS, 2008 GDHS.

5.8 Mothers religion and child survival

The religious affiliation of mothers did not show a statistically significant association with child survival. The results however indicate that the proportion of child deaths was highest among mothers who are traditionalists and lowest among mothers of the Other Christian religious affiliations (Table 5.7). A possible explanation for this pattern is that, mothers who are traditionalists may not seek orthodox medical care or delay in seeking health care when their child is sick because of their traditional beliefs.

Table 5.7: Association between mother's religion and child survival

	Child is alive	
Religion	No (%)	Yes (%)
Orthodox Christian	3.5	96.5
Other Christian	2.6	97.4
Moslem	3.4	96.6
Traditionalist	8.0	92.0
Other	6.5	93.5
Pearson Chi-Square = 9.201, p-value = 0.056		

Source: GSS, 2008 GDHS.

The lack of or delay in seeking medical care could be the reason why a higher proportion of deaths were reported among mothers of the traditional religious group.

5.9 **Mothers region of residence and child survival**

The region of residence of residence did not show a statistically significant association with child survival status suggesting that the region of residence does not influence a child's chances of survival.

Table 5.8: Association between mother's region of residence and child survival

	Child is alive	
Region of residence	No (%)	Yes (%)
Greater Accra	3.4	96.6
Central	5.0	95.0
Western	2.6	97.4
Volta	1.7	98.3
Eastern	3.2	96.8
Ashanti	4.5	95.5
Brong Ahafo	3.7	96.3
Northern	4.8	95.2
Upper East	2.5	97.5
Upper West	6.9	93.1
Pearson Chi-square=7.453 , p-value= 0.590		

Source: GSS, 2008 GDHS.

The results do not show a clear pattern of association between region of residence and child survival. The Upper West Region which is one of the poorest regions in Ghana recorded the highest proportion of child deaths (Table 5.8).

5.10 Place of residence and child survival

The chi-square test indicates that association between place of residence and child mortality is not significant (p=0.717). Due to the disadvantage faced by rural mothers, it expected that a child born in a rural area would have a lesser chance of living up to age five compared to a child born in an urban area. However, in this study, it appears children in rural and urban areas are sharing the same fate. Table 5.9 shows that child mortality difference is closing up in urban (3.7%) and rural (4.0%) areas (now only 3 more children die in the rural area). These observations may be attributed to policy intervention targeted at rural areas, free antenatal and delivery policies introduced by the government.

Table 5.9: Association between place of residence and child survival

Place of residence	Child is alive	
	No	Yes
Urban	3.7%	96.3%
Rural	4.0%	96.0%
Pearson Chi-Square value= 0.132, p-value= 0.717		

Source: GSS, 2008 GDHS.

5.11 Child size at birth and child survival

Again, although very low and heavy weights increase mortality risk, the p-value (0.213) observed shows no significance for child survival. It is common knowledge

that, usually birth weights reflect ability of babies to survive illnesses immediately after birth.

Table 5.10: Association between child size at birth and survival

	Child is alive	
Size of child at birth	No (%)	Yes (%)
Very large	4.3	95.7
Larger than average	2.6	97.4
Average	4.7	95.3
Smaller than average	3.3	96.7
Very small	6.1	93.9
Pearson Chi-square=5.821 , p-valus= 0.213		

Source: GSS, 2008 GDHS.

Notably, very small babies and over size babies suffered more mortality experiences with percentages of 6.2 % and 4.3 % respectively. Generally, 93 % of all babies born survived within the various age categories (Table 5.10).

5.12 Household sanitation and child survival

Type of household sanitation is supposed to measure the likelihood of exposure of children to gastrointestinal disease through contaminated water. The results show that household sanitation is not significant (p-value of 0.782).

It is expected that, the good toilet facility would have an inverse association with child mortality, which implies that children who live in homes with modern facilities escape pernicious effects ending in deaths due to reduced chance of infection through improper disposal of toilet materials (Butz et al., 1982).

Table 5.11: Association between toilet facility and child survival

Type of toilet facility	Child is alive	
	No (%)	Yes (%)
Flush toilet	5.0	95.0
Pit toilet latrine	3.6	96.4
No facility	3.9	96.1
Other	4.5	95.5
Pearson Chi-square=1.079 , p-value= 0.782		

Source: GSS, 2008 GDHS Dataset.

Surprisingly, household with flush toilet facilities rather have more child mortality (5.0 %) than the other categories with minimum incidence of 3.6 % belonging to pit toilet latrine facility (Table 5.11). It is not certain what might have caused this anomaly, but maternal lifestyle (such as smoking, drinking and illegitimacy) in addition to other latent factors which was not examined might be suspected for this.

5.13 Household water and child survival

Similarly, the results indicate that household water has no significant association with child mortality (p=0.620). It is expected that with improved water at least incidence of child mortality will decrease (Butz et al., 1982) but in this study the results show otherwise.

Table 5.12: Association between source of drinking water and child survival

Source of drinking water	Child is alive	
	No (%)	Yes (%)
Improved	4.1	95.9
Unimproved	3.4	96.6
Bottled/sachets water	2.1	97.9
Other	5.9	94.1
Pearson Chi-Square value= 1.776, p-value= 0.620		

Source: GSS, 2008 GDHS.

About 4.1 % of children died in homes with improved water source (Table 5.8). It was also observed that only 2.1 % of children died in homes using bottled and sachet water. Overall, more than 94% of children survived in all categories. It is worth noting that water storage at the household level was not look at, but this common in Ghana, in this study and data on water storage was not collected. Then also, under favourable conditions, if children do not still survive, then I may agree with Scrimshaw's (1978) assertion on desire for having babies, where women may give away children through neglect because they are unwanted and this might have cause the reverse relationship.

CHAPTER SIX

DETERMINANTS OF CHILD SURVIVAL IN GHANA

6.1 Introduction

This chapter discusses the relationship between education and child survival using the binary logistic regression analysis. The analysis also examines the effect of education and other socio-economic variables on child survival. Binary logistic regression analysis is a statistical analysis for studying the relationship between a binary dependent variable and two or more independent variables.

In the analysis for this study, the binary regression model was fitted in three steps. In the first model, the education variable was regressed on child survival, while the second model considered education, the intermediate variables and child survival. For the third model, education, control variables and intermediate variables were regressed on child survival.

6.2 The effect of mothers' educational level and child survival

The result of Model 1 in Table 6.1 is a Binary Logistic Regression of socio-economic variables and the survival of a child. The model shows that education alone explains only two percent of the variation in child survival. Thus, about 98 percent of the variations are due to other variables. The mothers' level of education did not show a significant association with the survival of a child. This finding is at variance with the differentials in child mortalities observed in sub-Saharan Africa which shows that the higher a woman's educational level, the more likely children would survive till age five (Bongaarts, 2010). A major theory of the linkage between increased maternal education and reduced child mortality is that education gives women the power and

Table 6.1: Binary logistic regression of socio-economic variables and child survival

Variable	Model 1		Model 2		Model 3	
	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig
Education level						
No education	0.329	0.387	0.178	0.200	0.348	0.528
Primary	0.195	0.203	0.109	0.099	0.147	0.246
Secondary	0.474	0.562	0.203	0.235	0.340	0.507
Higher(RC)	1.000	-	1.000	-	1.000	-
Breastfeeding status						
Never breastfeed(RC)	-	-	1.000	-	1.000	-
1-3 months	-	-	16.152	0.000	14.556	0.000
4-5 months	-	-	19.334	0.000	18.509	0.000
More than 6 months	-	-	39.904	0.000	43.344	0.000
Delivery place						
Home(RC)	-	-	1.000	-	1.000	-
Public sector	-	-	0.718	0.262	0.701	0.299
Private sector	-	-	1.078	0.884	1.185	0.778
Antenatal visits						
No antenatal visit(RC)	-	-	1.000	-	1.000	-
less than 4 visits	-	-	2.345	0.094	2.677	0.078
4 or more visits	-	-	2.623	0.034	2.897	0.034
Mother's age						
15-19(RC)	-	-	-	-	1.000	-
20-24	-	-	-	-	0.145	1.651
25-29	-	-	-	-	0.144	1.399
30-34	-	-	-	-	0.141	1.563
35-39	-	-	-	-	0.111	1.652
40-44	-	-	-	-	0.088	1.719
45-49	-	-	-	-	0.094	1.709
Occupation						
Not working(RC)	-	-	-	-	1.000	-
Professional	-	-	-	-	1.301	0.811
Sales/Services	-	-	-	-	1.294	0.549
Agricultural	-	-	-	-	1.179	0.739
Manual	-	-	-	-	0.986	0.982
Religion						
Christian	-	-	-	-	1.000	-
Other Christian	-	-	-	-	1.445	0.484
Moslem	-	-	-	-	1.207	0.676
Traditionalist	-	-	-	-	0.285	0.022
Other	-	-	-	-	0.745	0.616
Place of location						
Urban	-	-	-	-	1.000	-
Rural	-	-	-	-	1.101	0.788

Table 6.1continued:

Variable	Model 1		Model 2		Model 3	
	Exp(B)	Sig.	Exp(B)	Sig.	Exp(B)	Sig.
Region of residence						
Greater Accra	-	-	-	-	1.000	-
Central	-	-	-	-	0.934	1.055
Western	-	-	-	-	0.645	1.378
Volta	-	-	-	-	0.101	3.910
Eastern	-	-	-	-	0.848	1.137
Ashanti	-	-	-	-	0.949	0.965
Brong Ahafo	-	-	-	-	0.527	0.669
Northern	-	-	-	-	0.874	0.891
Upper East	-	-	-	-	0.319	2.505
Upper West	-	-	-	-	0.466	0.539
Size at birth						
Very large(RC)	-	-	-	-	1.000	-
Larger than average	-	-	-	-	1.525	0.283
Average	-	-	-	-	0.941	0.868
Smaller than average	-	-	-	-	1.666	0.382
Very small	-	-	-	-	0.914	0.888
Birth order	-	-	-	-		
1(RC)	-	-	-	-	1.000	-
2	-	-	-	-	0.040	2.757
3	-	-	-	-	0.641	1.258
4	-	-	-	-	0.452	1.483
5	-	-	-	-	0.401	1.704
6	-	-	-	-	0.611	1.467
7+	-	-	-	-	0.762	1.229
Sex of child						
Male	-	-	-	-	1.000	-
Female	-	-	-	-	0.622	1.146
Toilet facility						
Flush toilet(RC)	-	-	-	-	1.000	-
Pit latrine	-	-	-	-	0.056	2.389
No facility	-	-	-	-	0.206	2.185
Source of drinking water						
Improved	-	-	-	-	1.000	-
Unimproved					0.319	1.583
Bottle/sachet water					0.261	2.336
Other	-	-	-	-	0.822	1.371
Nagelkerke R Square	0.020		0.279		0.336	

Source: GSS, GDHS 2008**.**

the confidence to take decision-making on their own. Caldwell (1979) has argued that three factors are of importance in this regard. In ascending order, these are: (1) a

reduction in fatalism in the face of children's ill health, (2) a greater capability in manipulating the world (e.g. in knowing where facilities are, and in securing the attention of doctors and nurses) and (3) a change in the traditional balance of family relationships that shift the focus of power away from the patriarch and the mother-in-law and ensures that greater share of available resources is devoted to children. In this study, the mothers' level of education did not demonstrate a significant influence on child survival in the absence of other factors. Interestingly, the bivariate results shown in table 5.11 indicated otherwise.

This observation may indicate that, just providing people with knowledge through education on the stoppage and treatment of diseases is not enough. In addition, this mutual independence between maternal education and child survival in this regression results could be partly attributed to the transformation procedures applied.

6.3 The effect of mother's education level and intermediate variables on child survival

Model 2 in Table 6.1 shows the effect of education and other intermediate variables on child survival. The adjusted R^2 indicates that mothers' level of education, breastfeeding, place of delivery and number of antenatal visits explain about 28 percent of the variation in child survival. The results in Model 2 show that a mother's level of education does not significantly influence child survival after controlling for breastfeeding, place of delivery and number of antenatal visits.

6.4 The effect of mothers' educational level on child survival controlling for intermediate variables and other factors

Model 3 in Table 6.1, shows the effect of a mother's educational level and other socio-economic variables on the survival of a child. The results show that about 34 percent of the variation in child survival can be explained by all the variables used in the model. In model 3, the result with regard to education does not show a significant influence on child survival even after controlling for other intermediate factors and the characteristics of both the child and the mother.

The results from Model 3 (Table 6.1) show that breastfeeding was very significant (p-value= 0.000) in predicting child survival. Antenatal visitation was also found to be significant (p=0.034) in predicting child survival, children of mothers who made at least 4 antenatal visits were about three times as likely to survive compared to children whose mothers did not go for any antenatal visit. However, the contrary was observed for the bivariate analysis depicted in table 5.4. As explained earlier in this section, may be a different transformation method would reveal the cause of this contradiction clearly.

The results with regard to household toilet facility show that children from households that use pit latrine are about 2 times likely to survive compared to children from households with no toilet facility even though statistical significance was not achieved.

Mothers' age also show no significant relationship with child survival. Child size at birth was also not significant in determining child survival. Increasing birth order was

associated with lower chances of survival. Place of residence and source of water did not show statistical significance.

CHAPTER SEVEN

SUMMARY, CONCLUSION AND RECOMMENDATION

7.1 Introduction

This study sought to determine the relationship between the level of maternal education and child survival in Ghana. The unit of analysis was children under age 5. A sample of 2099 children was studied. The main objective of the study was to determine the relationship between the level of maternal education and child survival in Ghana. The specific objective was to look at how mother's education influences child survival controlling for other variables that also influence child survival.

Three analysis procedures namely univariate, bivariate and multivariate was used to analyse the data. Univariate and bivariate methods were employed to describe the background characteristics of the respondents and also examine the association between the dependent and the independent variables. At the univariate level, frequencies and percentages were used to describe the distribution of the characteristics of children and their mothers. At the bivariate level, chi-square test was used to ascertain the associations between child survival status and the independent variables used in the study. At the multivariate level, binary logistic regression analysis was used to examine the influence of education and other intermediate and socio-demographic variables on child survival. Child survival was used as the dependent variable.

7.2 Summary

The results show that of the 2099 children who were born in the last five years preceding the survey, 4% of children born five years prior to the survey did not survive whereas 96% of them survived. The results with regard to the level of education attained by the mothers of the children show that more than half (69%) of mothers have completed at least primary level of education while 31% have no formal education only 2 % attained higher education.

Mothers' level of education was found to be significant at the bivariate level, but the multivariate level did not show any significant association, with child survival. Place of delivery were also not significant is determining child survival. The number of antenatal visits made by the mother during the pregnancy was found to be a significant factor in determining child survival at the multivariate level only. Breastfeeding was also found to be a significant predictor of child survival at both the bivariate and multivariate levels of the analysis.

7.3 Conclusion

We are aware that mothers who have been to school lose fewer of their children in childhood than their unschooled counterparts. One cannot tell why this occurs and it might be so either in terms of the impact of education on women's behaviour as a whole and their contribution to child health. However, this research did not find much evidence to prove this generally accepted phenomenon as shown by the data analysis at both the bivariate and multivariate stages of the analysis.

This study established that maternal education is not a significant determinant of child survival. In all that was observed from the study, it appears that maternal education, on its own is not enough to ensure survival of children. Therefore, more study need to be undertaken to find out the many specific processes, which may vary regional throughout the country, by which maternal education contributes to child survival. Never the less it appears some level of general education is somewhat necessary for a mother to enable her lead a lifestyle which is healthy and also be confident to seek health services when needed.

7.4 Recommendation

The findings from this research suggest that general education is not a significant determinant of child survival. Rather, other factors such as breastfeeding and making regular antenatal visits significantly influence the chances of child survival. Thus while there is a need for mothers to have general education, there is also the need to emphasize practical health management applicable at the community, family and individual levels of life (i.e. comprehensive basic health education) for mothers. This will equip mothers with knowledge about good child care practices such as breastfeeding and going for regular antenatal visits which will increase the chances of their children surviving.

Basic health education would further create an enabling environment for school dropout mothers to obtain sufficient health information leading to quality health life of children in addition to sustained free antenatal and child delivery. Also, Child breastfeeding promotion must be intensified and provision made for working mothers outside home to breastfeed even while at work.

Also, it is necessary to provide the enabling environment for mothers to apply their knowledge gain through general education or from basic health knowledge programmes.

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