DETERMINANTS OF UPTAKE OF CHILDHOOD IMMUNIZATION AMONG MOTHERS OF UNDER-FIVE IN ASUOGYAMAN DISTRICT, GHANA

BY

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DECLARATION

I Mary Annang, do hereby declare that, apart from references made to works done in relation to this subject area which have been duly acknowledged, this work was independently done by me under supervision. I further declare that this work has not been submitted for the award of any degree in this university or elsewhere.

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DEDICATION

This work is dedicated to my parents, Mr. Henry Annang and Mrs. Vida Annang of blessed memory, my children, Roselyn Ohenewaah Ansah and Rita Ofosua Ansah. I also dedicate this work to my siblings especially Gideon Annang for all their support, encouragement and prayers.

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I wish to acknowledge the Almighty for how far he has brought me and for giving me the strength and wisdom to go through this program.

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OPERATIONAL DEFINITION OF TERMS

In this study the following terms were used:

Knowledge---This refers to what respondents say about having heard of immunization, the six Childhood killer diseases, and immunization schedules

Attitude-------This is what respondents feel about immunization and their willingness to Immunize their children or not.

Practices------These are acts that promote or inhibits immunization uptake by mothers

LIST OF ABBREVIATIONS/ ACRONYMS

AARR	Average Annual Rate of Reduction
AMC	Advance Market Commitment
ANC	Antenatal Clinic
BCG	Bacillus Calmette Guerin
CHN	Community Health Nurse
CI	Confidence Interval
CWC	Child Welfare Clinics
DANIDA	Danish International Development Agency
DCD	Disease Control Department
DCO	Disease Control Officer
DFID	Department for International Development
DHS	Demographic Health Survey
DPT	Diphtheria Pertussis Tetanus
DPTHH	Diphtheria Pertussis Tetanus Hepatitis B Haemophilus Influenzae type b
EPI	Expanded Program on Immunization
GIVS	Global Immunization Vision and Strategy
GVI	Global Alliance for Vaccine and Immunization
IFFI	International Finance Facility for Immunization
JHS	Junior High School
JICA	Japan International Cooperation Agency

LMIC	Lower Middle Income Countries
MDG	Millennium Development Goals
MOH	Ministry of Health
MSL	Mean Sea Level
NDPC	National Development Planning Commission
NIP	National Immunization Program
OPV	Oral Polio Vaccine
PEI	Polio Eradication Initiative
RI	Routine Immunization
SDG	Sustainable Development Goals
SSA	Sub-Saharan Africa
SSS	Senior Secondary School
TT	Tetanus Toxoid
U5M	Under Five Mortality
UK	United Kingdom
UN	United Nations
UNICEF	United Nations International Children Educational Fund
VDP	Vaccine Preventable Diseases
W.H.O	World Health Organization

ABSTRACT

Promoting immunization uptake has the potential to reduce substantially vaccine preventable diseases among children. It is a reliable way of combating mortality and morbidity in children. In spite of the availability of vaccines, there is low uptake of immunization in developing countries such as Ghana. Mothers play a key role in the immunization of their children. This study seeks to describe the determinants of uptake of immunization among mothers with children under-five in the Asuogyaman district of the Eastern Region of Ghana.

A cross-sectional study design using quantitative research tools was employed. The EPI cluster sampling strategy was adapted and used to recruit 174 women with children under five years for the study. Data from administered questionnaire were analyzed using STATA version 14.

The study found out that majority of mothers in the study area had knowledge about immunization. Also, most mothers have positive attitude towards immunization and more than half had immunized their children. However, “long waiting time” and “too busy “schedule were identified by mothers as constrains towards immunization of their children.

Measures to improve immunization uptake by mothers should target addressing long waiting time as well as making immunization schedules convenient to mothers.

Keywords: Knowledge, Attitude, Practices, uptake, immunization.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background Information

Immunization remains one of the most crucial public health interventions and a cost effective strategy to reduce both the morbidity and mortality associated with infectious diseases. It is estimated to avert between 2 to3 million deaths each year worldwide (Legesse & Dechasa, 2015). Across the world, universal immunization of children against six preventable diseases (Tuberculosis, Diphtheria, Pertussis, Tetanus, Polio, and Measles) is recognized as vital to reduce childhood mortality and morbidity. Thus routine immunization (RI) has been noted to contribute immensely to reduction in mortality from these vaccine preventable diseases among children and is one of the indicators of development in most developing countries (Adedire *et al*., 2016). Significant gains have been made through immunization resulting in a reduction in the burden of vaccine preventable illness globally with an estimated 35 million dollars spent between 2006 and 2015 on vaccines (Laryea *et. al.*, 2014).

Immunization of children against vaccine preventable diseases continues to receive considerable attention by the various health organizations such as World Health Organization (WHO) and United Nation for International Children and Education Funds (UNICEF) among others. This has been demonstrated in various ways through the development of several policy frameworks for member countries to develop effective programmes on vaccines and immunization in order to protect children less than five years from dying at an early age. For example the WHO and UNICEF developed the Global Immunization Vision and Strategy (GIVS) in 2006 aimed to help

countries to vaccinate more people, especially those who reside in hard to reach communities (Chambogo *et. al*, 2016). Also in their study, Duclos *et. al.,* (2009) revealed that the GIVS was developed by WHO and UNICEF as a framework for strengthening national immunization programmes and protect as many people as possible against more diseases by expanding the reach of immunization, including new vaccines, to every eligible person. It is for this reason child health immunization has been made the center of the Millennium Development Goals (MDG) (NDPC, 2006) which is an intervention strategy to maintain the health of children and prevent them from dying at an early age (UNICEF, 2007). This policy framework has proved effective in terms of coverage where about three quarters of the world's child population is reached with the required vaccines. For example, global mortality has reduced by 74% and out of this Africa accounts for 89% reduction in measles (Adebiyi, 2013). Additionally, the average annual rate of reduction (AARR) in Under Five Mortality (U5M) rate observed from 1990 to 2006 was 1% in Sub-Saharan Africa (SSA); but an AARR of 10.5% between 2007 and 2015 is required for the region to succeed at then SDG3 target (UNICEF, 2007).

Despite improved world coverage of child vaccines, only half of the children in Sub-Saharan Africa get access to basic immunization and in poorer remote areas of developing countries, only one in twenty children have access to vaccination (UNICEF, 2007). So far the concept child immunization has become critical a phenomenon for the survival of children less than five years. This has been confirmed by a UNICEF report that child immunization can save the lives of 2.5 million children every year in developing countries. It is for this reason that the WHO established the expanded programme on immunization (EPI) in 1974, with the goal of ensuring full accessibility of routine immunization vaccines to all children. According to the EPI, a child should

receive Bacillus Calmette Guerin (BCG), three doses of oral polio vaccine (OPV) and Diphtheria Pertussis Tetanus (DPT), and measles vaccines by 12 months of age to ensure maximum protection against VPDs. Receipt of these vaccines at the recommended ages and intervals will provide the children adequate protection from VPDs (Adedire *et al.,* 2016).

In Ghana, immunization has been a core public health activity through the EPI since1985. Ghana's high under-5 mortality rate coupled with the non-availability of skilled healthcare professionals and health facilities make immunization an essential health intervention. Vaccine administration at recommended age is important as such recommendations are based on the estimation of the age at which a child's risk for target diseases is highest. The Measles vaccine for example is administered earlier, usually by 9 months of age, in most developing countries such as Ghana and Nigeria because of the higher risks of transmission of the disease compared with developed countries as England where the vaccine is given later. Timely receipt of vaccines is important because it ensures that the recipient is protected from target diseases as early as possible. Delayed administration of vaccines can result in longer periods of susceptibility among children which can result in an epidemic when a case of a specific vaccine preventable illness occurs (Laryea *et al*., 2014).

A study showed that from a global perspective, child mortality has drastically decreased from 12.6 million in 1990 to 6.3 million in 2013 through vaccines and immunization with the help of governments and organizations (Bustreo et al. 2014). Also globally the annual number of deaths in children under-five fell to 57 per 1000 births in 2010 from 88 per 1000 births in 1990. In terms of coverage rate, DTP3 (three doses of vaccine for diphtheria–tetanus–pertussis) in low-income countries under Global Alliance for Vaccines and Immunization (GAVI) rose from 68% in 2000 to 83% in 2013 (Boachie-Yiadom, 2014). The benefits of child immunization to economies are

that it increases human capital and worker productivity. It also enhances school attendance, cognitive abilities of the child as a teenager and a determinant of adult labour market success and earnings. It is for these reasons Ghana pays critical attention to child immunization programs as a means to contribute to the overall reduction in poverty by reducing Vaccine Preventable Diseases (VPD) (Gram *et al.*, 2014). These notwithstanding, VPDs are still responsible for about 25% of the 10 million deaths occurring annually among children under five years of age. This is partly related to the fact that mothers in Ghana for example have been found wanting in their roles in terms of Knowledge, Attitude and Practice towards immunization of their children against the six killer diseases (Duclos *et al.*, 2009).

1.2 Problem statement

Globally, it is estimated that about two to three million deaths occurs yearly as a result of vaccine preventable diseases (VPD) with approximately 1.5 million deaths among under-five children (Adedire *et al*., 2016). Despite the efforts to improve immunization services, approximately 27 million infants were not vaccinated against measles or tetanus in 2007 globally. As a result, 2–3 million children are dying annually from easily preventable diseases, and many more fall ill (Etana & Deressa, 2012). Also Gram et al., (2014) in their study found that worldwide, 6.9 million babies under the age of five die every year; 99% of these deaths take place in developing countries. Infant mortality rate and the mortality rate of children under 5 years of age constitute two of the most useful indicators to gauge the level of development of a country and to compare among countries. Of the 35 countries in the world with the highest rates of mortality of children under 5 years of age, 33 are in sub-Saharan Africa (Levine & Robins-browne, 2009). Each year millions of children

worldwide, mostly from low- and middle-income countries (LMICs), do not receive the full series of vaccines on their national routine immunization schedule (Oyo-Ita *et. al*., 2016).

A significant proportion of these deaths are attributable to vaccine-preventable infectious diseases such as Haemophilus influenzae B (Hib), measles, pertussis and tetanus. At the end of 2011, immunization was reported to have saved 2 to 3 million lives; nonetheless, in the same year 1.5 million children are estimated to have died (more than 70% live in ten African and Asian countries) from VPDs. This is a reflection of the incomplete uptake or coverage with existing vaccines that persists in many parts of the world (Legesse & Dechasa, 2015). Thus Odusanya *et al*., (2008) revealed despite the availability of vaccines for immunization, vaccine preventable diseases remain the most common cause of childhood mortality with an estimated three million deaths each year and this could be due to problems with uptake of immunization.

Children who missed vaccines or are partially vaccinated are said to be at high risk of vaccine preventable diseases that claim millions of lives each year. It is also estimated that 10 million children under-five years die, one third of which is attributable to infectious diseases that would have been vaccine prevented (Mvula *et al*., 2016). Also, delayed vaccine uptake may have implications for public health programmes including the occurrence of fatal disease in individuals, outbreaks, and negatively impact national and international targets of disease elimination (Laryea *et al*., 2014).

In 2013 approximately 6.2 million children under the age of five died worldwide, and 3 million of these deaths occurred in Sub-Saharan Africa (SSA) and it is estimated that if global vaccine coverage increased to 90% by 2015, then approximately two million deaths of children under the age of five would be prevented (Sodha & Dietz, 2015).

In the Sub- Saharan African countries, vaccine coverage rates remain well below the WHO goal of 90% and various factors have been suggested including factors influencing immunization uptake (Vonasek *et al.*, 2016). The Asuogyaman district of the Eastern Region is one of the districts in Ghana with low immunization coverage. Of the many factors suggested to influence low childhood immunization coverage in under resourced settings, factors determining the uptake of immunization at the level of the parents has largely been overlooked. The aim of this study is to assess the determinants of immunization uptake among mothers with under-five children in the Asuogyaman district of the Eastern Region of Ghana.

1.3 Rationale of study

In 2008, the WHO Strategic Advisory Group of Experts on Immunization called for increased information about the factors leading to non-vaccination and under-vaccination of children in order to develop strategies to improve the uptake of childhood immunizations. Surveying the determinants of immunization uptake among mothers is an important step towards understanding the factors that influence vaccine non-acceptance in a particular setting in order to develop strategies that will improve immunization (Vonasek *et al*., 2016).

Assessing immunization uptake helps to evaluate progress in achieving programme objectives and in improving service delivery. In addition, evaluation of immunization uptake provides evidence whether substantial progress towards achieving vaccination targets is being made. Such positive evidence is required for continuing support from donor-supported initiatives like the Global Alliance for Vaccines and Immunizations (GAVI) (Odusanya*et al*., 2008).

WHO estimated that 17% of global annual under-five mortality could be prevented through increasing routine immunization uptake of which 2.2% could be prevented through pertussis vaccination, 2.3% through Hib vaccination, 1.3% through measles vaccination, 0.7% through tetanus vaccination, 5.2% through rotavirus vaccination and 5.4% through pneumococcal vaccination. Clearly, immunization uptake plays a key role in the global strategy for improving child survival hence the need to identify factors determining uptake among mothers with children under-five (Gram *et al.*, 2014). Furthermore, identifying the determinants of uptake of immunization among mothers will guide evidenced-based interventions to improve immunization coverage in the community. This study looks at the determinants of uptake of immunization among mothers with children under five in the Asuogyaman district in the Eastern Region of Ghana.

1.4 Conceptual framework

The study hypothesizes immunization uptake by mothers with children under five years is determined by a number of factors including Knowledge about immunization, attitude towards immunization, practices emanating from the side of mothers and immunization services and socio-demographics characteristics of the study population. Figure 1.1 illustrates the conceptual framework of the study.

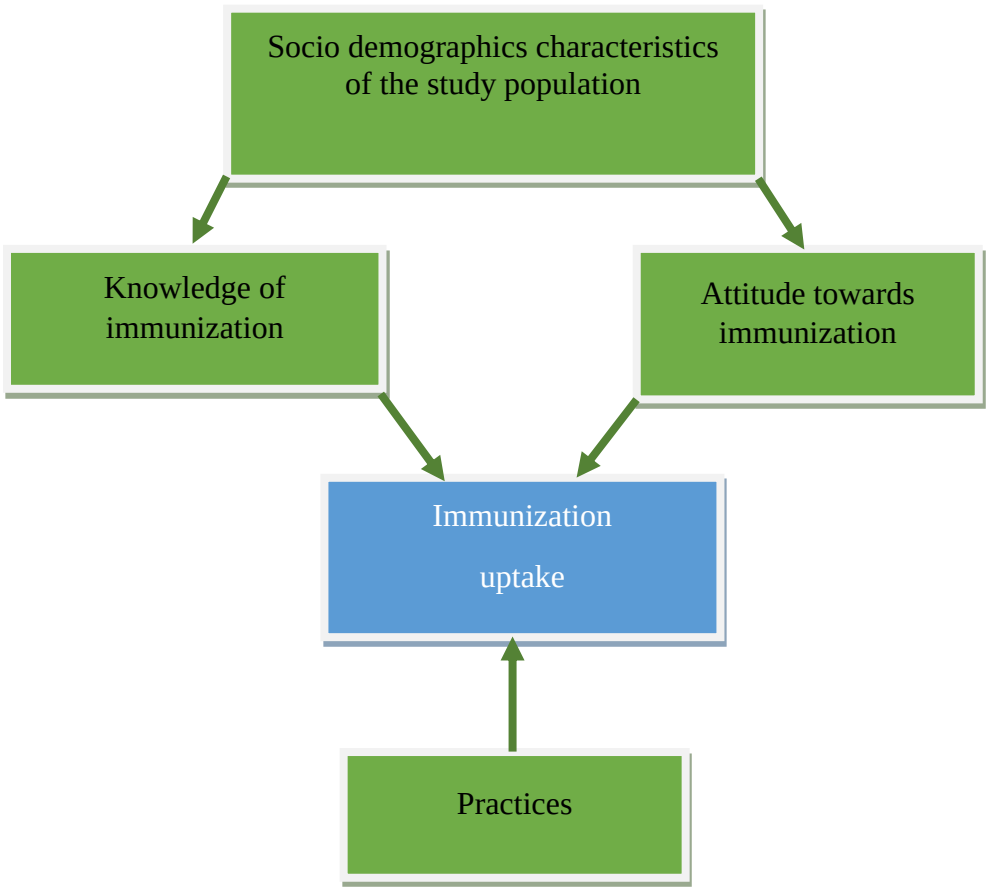

Figure 1.1: Conceptual framework

Source: Author's construct, 2017

1.5 Research Questions

1. What is the knowledge of mothers regarding immunization of their children?

2. What is the attitude of mothers towards immunization of their children?

3. What is the relationship between mothers' knowledge and immunization of their children?

4. What percentage of mothers with children under five are compliant with immunization of their children?

1.6. General objective

The general objective of the study was to identify the determinants of uptake of immunization among mothers with children under-five in the Asuogyaman District in the Eastern Region in Ghana.

1.7 Specific objectives

The following were the specific objectives of the study:

1. To determine the knowledge of mothers regarding immunization

2. To examine the attitude of mothers towards immunization

3. To evaluate the relationship between mothers' knowledge of the six childhood killer diseases and immunization status of their children.

4. To determine the percentage of mothers who are compliant with immunization of their children.

1.8 Profile of Study Area

The Asuogyaman District is located approximately between latitudes 6º 34º N and 6º 10º N and longitudes 0º 1º W and 0º14E. It is about 120m above Mean Sea Level (MSL). It covers a total estimated surface area of 1,507 sq. km, constituting 5.7 percent of the total area of the Eastern Region. Also the Afram Plains South District borders the district to the north and the Upper and Lower Manya districts to the south and west respectively. Asuogyaman is a traditional district

situated between the Volta and Eastern Regions and share borders to the east with Kpando, North Dayi, Ho and the North Tongu Districts of the Volta Region. The major towns in the district are namely, Akosombo, Atimpoku, Gyakiti, Senchi, New Akrade, Akwamufie, Anum, Boso etc. are located on either banks of the Volta Lake.

The population of the district is heterogeneous in terms of ethnicity and religion. The predominant ethnic group is the Ewe (45.8%), followed by the Ga-Adangme (28.1%) and Akan (11.6%). Other ethnic groups make up the remaining portion of the population. The dominant practiced religion in the district are Christianity (89%), followed by Islam (3.7%) and African Traditional religion (2.4%) respectively. There also exist smaller groups of people who adhere to other religious practices or have no religious affiliations. The district has a total population of 98,046, as at the 2010 National Population and Housing Census, representing 3.7% of population of Eastern Region and a total of (52.0%) more female than males (48.0%).(GSS,2014).

The Asuogyaman District is essentially a rural district with majority of the people in the district living in the rural areas representing (70.6%) compared to the urban areas representing (29.4%). Child mortality rate is 8.7% per 1000 live births and it is very high in Yilo Krobo (13.6) and Kwahu East (12.9). Marital status of 39,706 of females 12 years and older showed that females married with basic education is 57.8% and those married with no education are 27.7%. The non-formal/consensual and union or living together show females with no education came to 22.8% whiles those with basic education arrived at 69.2%.(GSS,2014).

1.9 Scope of study

The study assessed the determinants of uptake of immunization among mothers with children under five years in the Asuogyaman district of the Eastern Region of Ghana. The study specifically assessed mother's knowledge, attitude and practices determining immunization uptake. Thus, the study results are limited to the Asuogyaman district. However, the findings may be extrapolated to apply to other districts in terms of decision making since statistical methods where employed in the study.

1.10 Organization of report

The entire study is organized into six chapters. Chapter One is the Introduction and covers areas such as background of the study, statement of the problem, research questions, objectives of the research, rational of the study and the scope of the study. Chapter Two, covers the literature review. Chapter Three is the research methodology; whiles Chapter Four presents the research findings. Chapter Five (5) deals with analyses and discussion of the findings. The final Chapter is Six, and comprises of conclusion and recommendations.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Immunization

Immunization is the process of stimulating an active immunologic defense in preparation of meeting the challenge of future exposure to diseases. Therefore, it is the introduction of weakened, live or dead micro-organism called vaccines to the body system to stimulate the production of the antibodies to confer immunity (Bullough & Bullough, 1990). Immunization and vaccination are used interchangeably in this study. However, strictly speaking, vaccination is the process of administrating a vaccine while immunization is the response of the system following vaccination. In other words, immunization consists of the process of developing immunity after being administered with vaccines. Vaccines are modified or attenuated product of a micro-organism to mimic natural infection and evoking an immunologic response that presents little or no risk to the recipient. Thus, the recommended doses, routes, techniques of administration and schedules must be followed for predictable effective immunization and this may differ from one country to another (Bullough & Bullough 1990)

Immunization has been described as one of the greatest public health achievements of the 20th century and is seen widely as a worthwhile and cost-effective public health measure. Vaccination programmes have led to large reductions in disability and death from polio, measles, tetanus, rubella, diphtheria and Haemophilus influenzae type b.(Etana & Deressa,2012) However, over 24 million children are still without access to this important health intervention contributing to millions of preventable child deaths in Lower Middle Income Countries (LMICs). Efforts to

improve vaccination coverage in LMICs are central to meeting the Millennium Development Goals (MDGs) now Sustainable Development Goals (SDG) of reducing child mortality (Saeterdal, Lewin, & Glenton, 2014). Also, immunization is a powerful public health strategy for improving child survival, not only by directly combating key diseases that kill children but also by providing a platform for other health services (Oyo-Ita *et. al*., 2016). Through immunization a number of serious childhood diseases have been successfully prevented or eradicated. For instance the immunization campaign carried out from 1967 to 1977 by the WHO eradicated the natural occurrence of small pox (Etana & Deressa, 2012).

In order to understand the importance of vaccines to human beings, one must have insight into its history. The first vaccine introduced to control cowpox was discovered by Edward Jenner in 1978 then vaccine for anthrax in animals and rabies in human beings was discovered in 1877 followed by the discovery of tuberculosis vaccine by Robert Koch in 1890, the BCG vaccine by Léon Charles Albert Calmette and Cameille Guérin, vaccine against diphtheria in 1890 by Emil Adolf Behring and Shibasaburo Kitasato, vaccine for whooping cough by Bordetella Pertussis between 1923-1929 (Parish, 1965). Also immunization against tetanus in humans was demonstrated by Gaston Léon Ramon and Christian Zoeller; inactivated vaccine for poliomyelitis was prepared by Jonas Edward Salk around 1954 and active vaccines for poliomyelitis was prepared by Albert Bruce Sabin from 1953 to 1955 and Samuel Katz later produced measles vaccines (Parish, 1965). These were serious attempts made by concerned medical scientist to prevent human beings from contracting such dangerous diseases.

Till date, immunization continues to be a major public health issue demanding a lot of focus and attention. Thus Sodha *et al*. observed that a successful immunization system requires the

synchronization of multiple programme components to provide a child the opportunity to be successfully vaccinated (Sodha & Dietz, 2015). Vaccines must be procured, and successfully delivered to the service delivery level, while constantly maintained through a functioning cold chain. Health workers must be trained in vaccine management, handling and administration; data recording and reporting and appropriate interaction with caregivers of young children. Creating community demand for immunization is critical to ensuring that caregivers value vaccination, and know when and where to bring their children to be vaccinated. The overall coordination, management and implementation of these activities require political support, sustained financing, supervision and the appropriate monitoring and use of high-quality data. Thus immunization has become a critical component of policies that aim to address health inequity (Bawah *et al*., 2010).

2.2 The Expanded Program on Immunization (EPI)

One of the triumphs of public health was the establishment of the Expanded Programme on Immunization (EPI) by veterans of the Smallpox Eradication Program. In 1974, a concerted global effort to use immunization as a public health strategy began when the WHO launched the EPI following the successful global smallpox eradication programme (Oyo-Ital *et al*., 2016). At the launch, WHO recommended a standard immunization schedule covering six basic antigens (i.e. tuberculosis (Bacille Calmette-Guérin (BCG)), polio, diphtheria, tetanus, pertussis, and measles), which are generally referred to as traditional EPI vaccines. With the emergence of new vaccines, more killer diseases can be prevented in infancy and adolescence. These vaccines include (but are not limited to) hepatitis B, Haemophilus influenza type b (Hib), human papilloma virus,

pneumococcal conjugate, rotavirus, yellow fever, meningococcal meningitis A, Japanese encephalitis, and rubella vaccines (Oyo-Ita l*et al*., 2016).

According to the EPI, a child should receive BCG, three doses of oral polio vaccine (OPV) and Diphtheria Pertussis Tetanus (DPT), and measles vaccines by 12 months of age to ensure maximum protection against VPDs. Receipt of these vaccines at the recommended ages and intervals will provide the children adequate protection from VPDs (Adedire et al., 2016). The traditional EPI vaccines are estimated to prevent 2.5 million child deaths annually (mainly from measles, pertussis, tetanus, and diphtheria), as well as to prevent severe morbidity for millions more children around the world from devastating diseases such as poliomyelitis and tuberculous meningitis (Oyo-Ita *et al*., 2016).

At the initiation of the EPI, it was estimated that only 5% of infants in the developing world received immunizations. By the late 1980s, with impetus and coordination from the Task Force for Child Survival, a coalition of the United Nations (UN) and other agencies dedicated to increasing access to EPI vaccines, coverage extended to 80% of the world's children. However, by the mid-1990s immunization rates began to drop again, as the EPI infrastructure decayed without adequate replacement(Levine & Robins-browne, 2009).

Since the inception of the EPI, the WHO has targeted the six vaccine-preventable diseases through training, surveillance, and coordination with national immunization programs and other organizations. Vaccine coverage currently being reported by WHO include:

- BCG: to prevent certain types of tuberculosis, mainly during the first year of life, administered soon after a child's birth;

- OPV: three doses to protect against poliomyelitis, given during the first year of life. Volunteers, rather than trained health workers can administer oral polio vaccine, as it does not require injection equipment. Some countries also use a killed, inactivated polio vaccine that needs to be injected.
- DPT: usually three doses of a combined vaccine that protects against diphtheria, pertussis, and tetanus, given during the first year of life.
- Measles: a single dose of measles vaccine given during the first year of life, usually at 9 months (but at 12-15 months in industrialized countries).
- Yellow Fever (in endemic countries): during the first year of life for children over 6 months of age in the endemic countries of tropical and subtropical Africa and South America, often administered at the same time as measles immunization
- Hepatitis B: usually three doses of a vaccine to prevent hepatitis B, recommended as part of routine infant immunization schedule, given at same time as DPT. A combined DPT-Hepatitis B vaccine also exists.
- Hib: usually three doses of haemophilus influenzae type b vaccine to protect against meningitis and Hib pneumonia administered as part of DPT immunization. This can also be delivered as a combined DPT-Hepatitis B-Hib vaccine.
- TT (Tetanus Toxoid): a vaccine administered to pregnant women or women of childbearing age, consisting of at least two doses (with five providing lifelong protection), to prevent neonatal tetanus.

Of these eight vaccines, information on coverage is readily available for most countries for most years since 1980 from country immunization programs for BCG, OPV3, DPT-3, and measles. TT

coverage data are available for about one-half of low-and middle income countries, whereas yellow fever coverage (where recommended) and hepatitis B coverage estimates are available in less than 20 percent of countries. Incidence of the diseases prevented by these vaccines varies across countries, and the use of coverage measures should take these differences into account. Polio eradication is in its final stages, with many countries now being free of polio. Different strategies are used in administering polio, including mass campaigns to reach children 0-4 years old, irrespective of immunization history. Therefore, as an indicator of routine service delivery effectiveness, OPV3 coverage rates are less suitable. Measles has virtually disappeared from the Americas and periodic mass campaigns targeting young children irrespective of immunization history have become an important strategy. But in Africa and Asia, where measles remains an important cause of child mortality, monitoring coverage levels is still essential. BCG monitoring is less frequently used because the vaccine is delivered once, often by midwives and other birth attendants, rather than by immunization in many countries in equatorial Africa and in some countries in South America. Hib and Hepatitis B are too new and not in use in many countries.

For these reasons, DPT3 coverage rates are the most frequently used to monitor immunization coverage levels and trends. The WHO recommended schedule is to administer the vaccine at three different times during the first year of life (often at around 6, 10 and 14 weeks, but this varies from country to country) (Adedire *et al.*, 2016) The developing countries in Africa, South Asia, and East Asia and the Pacific observe this schedule. A four-dose schedule, with a booster dose administered in the second or third year of life is typical in European countries, while a five-dose schedule (two booster doses) is typical in the Latin American region. The existence of schedules allows the construction of more refined monitoring indicators: in addition to coverage with one, two, or three

doses of DPT, coverage by age can be monitored to assess age appropriate coverage. The multiple dose standard also enables calculation of dropout rates, which indicate what proportion of children receive 1 but not 2, or 2 but not 3 doses of the vaccine. Dropout rates can be used as indicators of a health system's ability to deliver services.

2.2.1 Funding source of EPI program

Financing for vaccines for immunization has being a major issue since the inception of the EPI. Beginning in the late 1990s, a revolution in global health cooperation and in vaccine financing occurred, allowing immunization issues to be confronted (Levine & Robins-browne, 2009).

In 1990, the World Summit for Children was convened at the UN headquarters in New York City to commemorate the Year of the Child. Immunizations were highlighted as the most cost-effective intervention to save the lives of young children in developing countries and steps were undertaken to start a new global initiative to ultimately create a temperature-stable 'Children's Vaccine' that with a single non parenteral inoculation would confer durable immunity against many infectious diseases. Many governments, UN agencies and other partners involved in immunization pledged funds and other resources to the newly established 'Children's Vaccine Initiative', which came to be housed within the WHO headquarters in Geneva, Switzerland. Regrettably, over the next few years few governments or agencies fully honored their commitments made at the World Summit for Children and, as a consequence, the Children's Vaccine Initiative was not able to realize its potential or achieve all its goals. In fact, slippage was occurring and fewer children in developing

countries were receiving immunizations than during the peak years of the 1980s(Levine & Robins-browne, 2009)

In March 1998, James D Wolfensohn, president of the World Bank, invited the heads of the other UN agencies involved in financing, procuring and delivering immunizations to children in the developing world and an assortment of other critical stakeholders (for example, representatives of vaccine industry, major institutes working on vaccine research, non-governmental agencies, and philanthropic entities such as the Rockefeller Foundation) to a meeting in Washington, DC to discuss the emerging crisis in global immunization. Discussions brought consensus on the fact that there was a crisis that had to be addressed. A commitment was made to form a Working Group to survey the immunization landscape and interview stakeholders globally from ministers of health to immunization field workers to permit identification of the most pressing problems and develop action plans to remedy the situation. The Working Group, with official representatives from the WHO, UNICEF, the World Bank, vaccine industry and the Rockefeller Foundation and with several additional nonvoting observers, completed its work between June 1998 and October 1999.

From this work a new coalition of stakeholders committed to providing immunizations for the world's children was formed: the Global Alliance for Vaccines and Immunization (GAVI). GAVI had its launch within the UN agencies at UNICEF headquarters in New York City in November 1999, followed by the worldwide launch at the World Economic Forum in Davos, Switzerland in February 2000. GAVI (currently known as the GAVI Alliance) identified three fundamental gaps:

1. Access, an unacceptably large number of the world's infants in developing countries did not have ready access to immunization services;

2. Equity, new vaccines (specifically hepatitis B and Hib conjugate) that were routinely being administered to infants in industrialized countries were not available to infants in developing countries;
3. lack of investment, insufficient investment was being made on research to develop vaccines against several diseases that are major afflictions in developing countries but are relatively uncommon in industrialized countries (for example, malaria, tuberculosis, meningococcal A disease, Shigella).

By the time of the launch of GAVI, the Bill and Melinda Gates Foundation was emerging as an electrifying new philanthropic force, bringing to the table previously unseen levels of financial resources, energy and commitment. A Fund was established to provide GAVI with financial resources to address the gaps and meet its strategic objectives. The Fund began with a donation of $750 million from Bill and Melinda Gates and a challenge to other donors to match that amount. Various governments and other donors followed suit, thereby putting significant financial resources at GAVI's disposal. The Fund (which over the years has had various names including the 'Children's Vaccine Fund', the 'Vaccine Fund' and currently, the 'GAVI Fund') began with three 'windows'.

- **Window 1** provided funds to applicants from the world's 74 poorest countries to strengthen immunization services, including refurbishing the EPI cold chain. This Immunization Services Support maintains a performance-based grant system.
- **Window 2** allowed selected countries with good immunization coverage among the 74 eligible countries to apply to receive free HBV and Hib conjugate for the entire infant birth

cohort for 5 years. The GAVI Alliance has more recently progressed to 10-year commitments for new vaccine introduction.

- **Window 3**, which opened 2 years after the other two, provided funds to accelerate the development and introduction of two critically needed new vaccines, pneumococcal conjugates and rotavirus vaccines(Levine & Robins-browne, 2009). In 2006, the GAVI Fund was recapitalized.

In addition, two substantial other funding sources became available. These were the International Finance Facility for Immunization (IFFI) and Advanced Market Commitment (AMC).

The IFFI was originally conceived by Gordon Brown when he was Chancellor of the Exchequer. Eight donors (the UK, France, Italy, Spain, Sweden, Norway, Brazil and South Africa) have pledged $3.9 billion to the IFFI. Sovereign obligations guarantee 'immunization bonds' that are sold in the capital markets. Money raised by the bond sales is then channeled by GAVI to support vaccines and immunization programs in developing countries, thereby providing long-term funding that allows long-term planning. Ultimately, IFFI repays bondholders with long-term funds committed by the donors (Levine & Robins-browne, 2009).

Although the GAVI Fund and IFFI provide important financial resources to strengthen immunization services and supply new vaccines, some of the newest vaccines are particularly expensive. The Advanced Market Commitment (AMC), yet another novel financial tool, was developed to provide funding for particularly needed new vaccines. AMC represents a financial commitment by donors to subsidize future purchase (at an agreed price) of a vaccine under development that meets certain technical specifications. Because pneumonia is the largest killer of children in the developing world and S. pneumoniae is the single most common cause of bacterial

pneumonia, there is great anticipation that infant mortality and morbidity can be substantially reduced following the programmatic introduction of pneumococcal vaccines. Consequently, pneumococcal conjugate vaccines were selected as the first to benefit from an AMC.

To be eligible for procurement through the AMC, a specific multivalent pneumococcal vaccine must meet a series of specific target product profile criteria, such as encompassing glycoconjugates to prevent serotypes 14, 1 and 5 diseases. The recently licensed 10-valent GSK pneumococcal conjugate vaccine and the as yet unlicensed 13-valent Wyeth Vaccines conjugate vaccine would meet this requirement. Developing countries must demonstrate demand for the vaccine and they must pay a small portion of the cost. The governments of Italy, the UK, Canada, Russia and Norway and the Gates Foundation pledged $1.5 billion to the pneumococcal conjugate AMC (Levine & Robins-browne, 2009).

2.3 EPI in Ghana

In response to the worldwide call to improve child survival, Ghana launched the EPI in June 1978 with six antigens BCG, measles, diphtheria-pertussis-tetanus (DPT) and oral polio for children under one year of age together with tetanus toxoid (TT) vaccination for pregnant women. The launch was in line with the national health policy to reduce morbidity and mortality of vaccine preventable diseases which then contributed significantly to both infant and child mortality in the country. It was also in consonance with the immunization policy of the government which sought to ensure that all children receive these vaccines before their first birthday of life (MOH, 2014)

The EPI which is responsible for immunization in Ghana is located within the Diseases Control Department (DCD) of the Public Health Division of the Ghana Health Service. It is headed by a Public Health Specialist and assisted by trained personnel who are specialists in areas that include logistics management, data management, cold chain management, injection safety, social mobilization and communication (MOH, 2014). Figure2.1 below illustrates the organizational structure of the health sector with particular emphasis on the management and coordination of EPI program in Ghana.

The mission of the program is to contribute to the overall poverty reduction goal of the government through the decrease in the magnitude of vaccine preventable diseases. This is carried out through the use of cost effective, efficacious and safe vaccines, new and under used vaccines and technologies to protect more people whilst contributing to the overall health systems strengthening in an integrated manner. Ghana has been at the forefront of showcasing immunization as the platform for health systems strengthening in Sub Saharan Africa (MOH, 2014).

In 1992, fourteen years after the launch, the government added yellow fever vaccination to the National immunization programme (NIP). The Polio Eradication Initiative (PEI) introduced in 1996 offered a major boost to the NIP through the resources offered for capacity building at all levels, funds for operational activities, adequate cold chain logistics, systems strengthening, partnerships, transportation facilities (MOH, 2014).

In January 2002, the Government of Ghana in partnership with the GAVI initiative and supported by other health development partners such as WHO, UNICEF, World Bank, USAID, JICA, Rotary, DFID, DANIDA, Civil Society Organizations etc. increased the number of antigens with

two new vaccines - the Hepatitis B and the Haemophilus influenza type b (also known as Hib). The two new vaccines were combined with the DPT into DPT-HepB+Hib (commonly referred to as the Pentavalent vaccine in the country) (MOH, 2014).

The Government of Ghana has been responsible for the total cost of traditional vaccines and injection supplies since the inception of EPI in 1978. It shares the cost of the Pentavalent and Yellow Fever proportionately with GAVI as agreed upon in the financial sustainability plan at the beginning of the introduction of the Pentavalent vaccine in 2002 until 2007 when the country rolled-on to the co-payment scheme under the bridge financing mechanism. Development Partners (DPs) provide support in various forms including campaigns. Some of the partners support needy districts with additional resources to improve on their immunization programmes. Immunization coverage has been on steady increase and as at the end of December 2007, 106 districts out of the 138 in the country, representing 84% achieved penta3 coverage of more than 80%. Incidence of most of the childhood killer diseases in the country have declined significantly (MOH, 2014).

Three strategies are implored for the delivery of the immunization services in the country- static at health centers, outreach in the communities and campaigns to reach out to most of the unreached populations. Static and outreach immunization services are delivered mostly at Child Welfare Clinics (CWC) by Community Health Nurses (CHNs) and Disease Control Officers (DCOs). At the CWC, other services like growth monitoring, vitamin A supplementation, de-worming are all delivered. Table 2.1 shows the new immunization schedule in Ghana.

According to Gram *et al*., (2014), the national schedule in Ghana follows that of the EPI. Newborn children are scheduled to receive BCG and live oral polio vaccine at birth; pentavalent diphtheria-pertussis-tetanus-Hib-Hep B (DPTHH) as well as polio vaccines at 6, 10 and 14 weeks; and

measles and yellow fever vaccine at 9 months. Static immunization clinics are held in public hospitals, health centers and community-based health planning services compounds on set days at specified time intervals, usually once a month. Mothers living in communities near static facilities are mobilized to attend the immunization clinics. Mobile teams hold clinics where no static health clinics exist or where vaccine uptake is low. Private facilities refer clientele to public facilities for immunization services. Staff at the immunization clinics record all vaccines administered in clinic-based registers as well as in the infants' child vaccination cards. Staff refer to these cards to determine what vaccines need to be administered; when the mother attends without the card, maternal recall of vaccination is used instead. Mass polio immunizations are organized twice a year countrywide in Ghana on specific days called National Immunization Days. Special campaigns are also organized in response to outbreaks of diseases such as measles. One week a year is also set aside as child health week, and based on the selected theme, activities may include immunization of children.

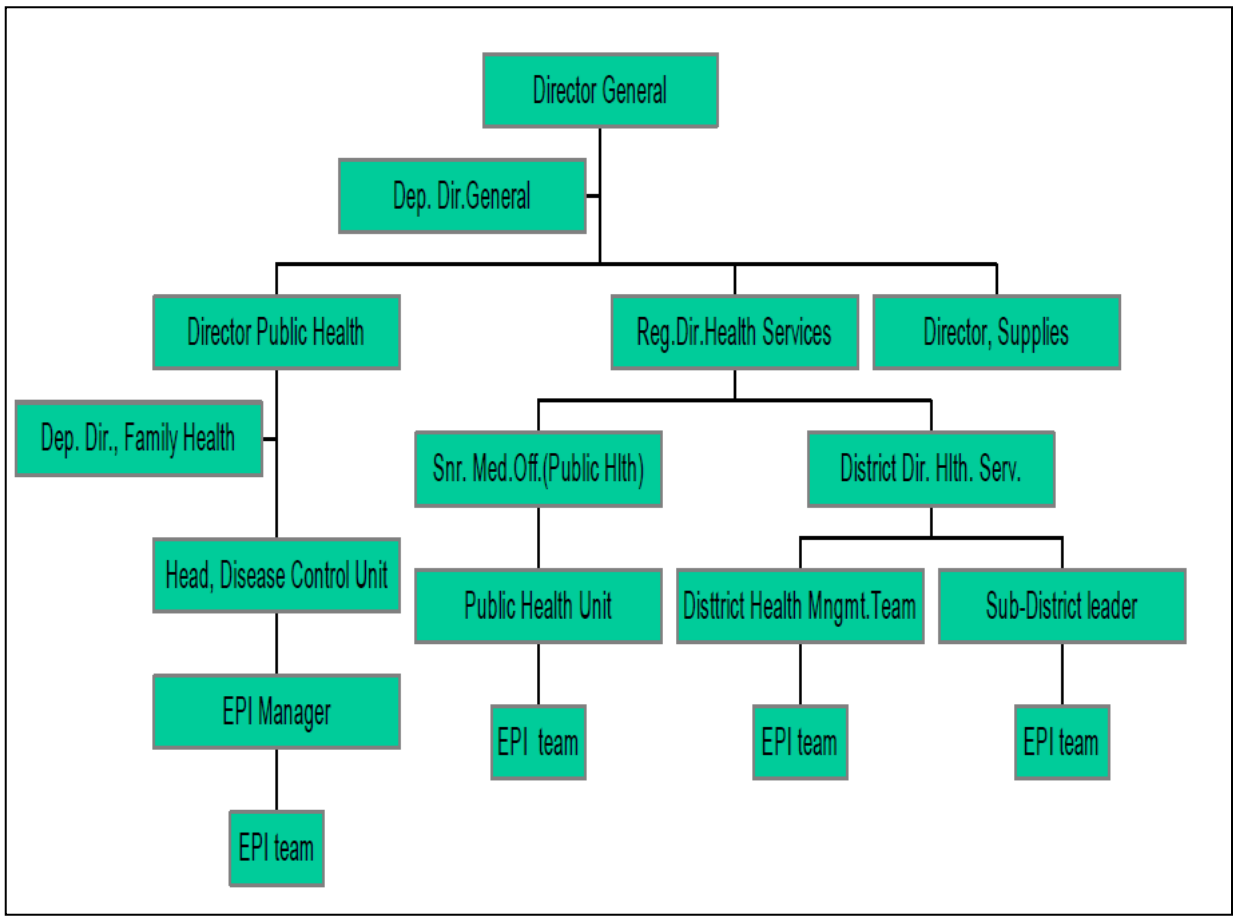

Figure 2.1: Organizational structure of EPI in the Ghana Health Service

Source: Ghana Health Service EPI 5YPOW (2002-2006), October 2002.

Table 2.1; Immunization schedule in Ghana

Vaccine/ Antigen	Dosage	Dosage Required	Minimum Interval Between Doses	Minimum Age To Start	Mode of Administration	Site of Administration
BCG	0.05ml up to 11 months 0.10ml after 11 months	1 dose	None	At birth (or first contact)	Intra-dermal	Right Upper Arm
Pentavalent	0.5 ml	3 doses 6, 10 and 14 weeks	4 week	At 6 week (or first contact after that age)	Intra-muscular	Outer Upper Aspect of Left Thigh
*Pneumo						Outer Upper Aspect of Left Thigh
Polio	2 drops	4 doses At birth, 6, 10 and 14 weeks	4 week	At birth within the first 2 weeks	Oral	Mouth
* Rotarix	1.2 ml	2 doses 6 and 10 weeks	4 week	At 6 week (or first contact after that age)	Oral	Mouth
Measles 1st dose	0.5 ml	2 doses 9 months	9 months	At 9 months	Sub-cutaneous	Right Upper Arm
*Measles 2nd dose		18 months		At 18 months		
Yellow Fever	0.5 ml	1 dose	None	At 9 months	Sub-cutaneous	Right Upper Arm
Tetanus Toxoid	0.5 ml	2 doses	One month	Pregnant Women	Intra-muscularly	Upper Arm
Vitamin A	100,000 IU 200,000 IU	10	6 months	6 months	Oral	Mouth

Source: MOH Immunization Programme, Comprehensive Multi-Year Plan (2010-2014)

2.4 Factors influencing uptake of immunization

In order to increase child immunization uptake, the underlying causes and parents' reasons not to immunize their children should be known (Legesse & Dechasa, 2015).

Vaccine preventable diseases outbreaks are linked to inadequate levels of immunization uptake and several factors are associated with poor uptake of immunization in resources-limited countries. A study involving 24 African countries showed immunization uptake is linked, at the contextual

level, to high community illiteracy rates, high country fertility rates, and living in urban areas, while, at the individual level, they are linked to poorest households, uneducated parents, parents with no access to media and/or with low health seeking behaviors and the relative effect of the above factors may significantly vary according to the geographical area. The study further noted that in Africa, a more detailed and comprehensive information at district level is necessary in order to develop and implement appropriate strategies for improving immunization uptake (Russo *et al*., 2015).

Legesse & Dechasa (2015) in a study to assess child immunization uptake and its determinants in Sinana District, Southeast Ethiopia, they identified that the major hindering factors from achieving universal immunization include: low access to services, low number of trained manpower, high staff turnover, lack of fund donors, lack of information, lack of transportation, distance from health facilities, inadequate awareness of mothers/caregivers, others such as missed opportunities, and high dropout rates especially through routine approaches.

Studies done in south and north Ethiopia showed that, mothers' educational status, urban residence and perceived health care support are significantly associated with complete immunization uptake. Studies in Mozambique, India and Bangladesh also showed utilization of maternal health care service like ANC, tetanus toxoid vaccination and institutional delivery is associated with complete immunization status of children. In addition, low access to services, inadequate awareness of caregivers, missed opportunities, and high dropout rate are major factors contributing to low immunization uptake (Etana & Deressa, 2012).

Research throughout Africa has shown that parental poverty and low educational attainment are adversely associated with the survival of children. Extensive scientific evidence also demonstrates

that low-cost vaccines are effective in reducing childhood mortality. Therefore, the adverse child-survival effects of poverty and low parental educational are widely assumed to be offset by the promotion of comprehensive childhood immunization. Thus immunization has become a critical component of policies that aim to address health inequity. Nonetheless, an examination of the impact of immunization on the association between poverty and child survival should be appraised directly. Health conditions, particularly for children, are worsening throughout Sub-Saharan Africa despite the widespread promotion of immunization in the region, challenging the assumption that immunization offsets the effects of poverty and this could be attributed to the variations in uptake of immunization (Bawah *et al*., 2010).

In Ghana the 1998 DHS revealed that the risk of infant mortality within the first year of birth amongst various ethnic groups was due to the differences in socio-economic status (Duah-Owusu, 2003). Most of the challenges mothers face in ensuring that their children get immunized from the six killer diseases are classified as socio-economic and cultural influences comprising of low income/poverty, illiteracy, superstition, religious taboos, emphasis on cure and traditional healers among others.

Some other studies that have found associations between immunization of children and the individual education of a mother are Cutts *et al*., (1991) in Guinea; Bhuiya *et al*., (1995) in Bangladesh and Matthews *et al*., (1997) in Ghana.

Boachie-Yiadom (2014) support the fact that there is a direct positive relationship between education and knowledge of mothers towards early child immunization against the six killer diseases and the survival rate of children less than 5 years. Otherwise such high levels of illiteracy

usually affect the knowledge of mothers on immunization leading to their negative attitude towards child immunization (Adebiyi, 2013).

A qualitative survey by Bosu *et al* on factors influencing attendance to immunization session at Eguafo-Abrem District of Ghana was carried out on 469 mothers with children less than 2 years revealed that 73% of the mothers attended child welfare clinics regularly however, the study indicated that one of the major factors hindering attendance were poor knowledge about immunization. (Bosu *et al.*, 1997). Another study suggested that parental attitudes towards overall health care greatly influence behavior toward vaccinations (Downs, et al., 2008). Similarly, in an earlier study Lindberg (2002) commented that mothers' attitude in terms of how they think or feel affects their willingness that is their behavior to immunize their children that are less than 5 years from the six killer diseases (Lindberg, 2002).

There are several factors that influence mothers' attitude towards immunizing their children and one of them is poverty or low income. For example, Panned and Yazbeck (2003) revealed that children of the poorest wealth quintiles were likely to be unimmunized in rural residences.

Many researchers (Topuzoglu *et al*., 2005; Cui and Golfing, 2007; Pande, 2003) argue that the socio-economic status of mothers affect their attitude towards immunizing their children less than 5 years.

Furthermore, mothers engage in certain practices for example complementary / alternative medicine (Gust *et al*., 2003; Stokley *et al*., 2008) hence prevent them from immunizing their children. This practice is further supported by Poland and Jacobson (2001) that mothers depend on 'rules of thumb' or heuristics to make vaccination decisions for their children.

CHAPTER THREE

3.0 METHODOLOGY

3.1 Study methods and design

A cross-sectional study design involving quantitative study tools was used in the study to describe the determinants of uptake of immunization among mothers of children under five years in the Asuogyaman District.

The quantitative approach was used to enable gathering of quantitative data and descriptive analysis of the data. The quantitative data was derived using a structured questionnaire which was interviewer-administered to collect primary data from respondents.

3.2 Data Collection Techniques and Tools

Field data collection was done between January 2017 and February, 2017 using structured questionnaire comprising closed ended questions.

3.3 Study population

The study population included 174 mothers in the Asuogyaman district who had children under five years of age. All mothers who had children under five years were thus recruited and the questionnaires administered to them.

3.4 Variables

The variables of this study comprised the dependent and independent variables

3.4.1 Dependent variables

The dependent variable of the study was immunization uptake.

3.4.2 Independent variable

The independent variables of the study included: socio-demographic characteristics, knowledge of immunization, attitude of mothers towards immunization and practices influencing immunization uptake.

3.5 Sampling

The EPI cluster sampling method was adapted and used to categorize the Asuogyaman district into clusters according to the various sub-districts. The convenient sampling method was then employed to collect data from the study participants. This method is appropriate giving the nature of the study population. Households within each cluster or sub district were visited conveniently to identify mothers with children between under five years. Any mother encountered on the field who met the inclusion criteria was interviewed.

3.5.1 Sample Size Determination

A sample size of 174 was derived based on the sample size formula for a single population shown below (Cochran, 1977):

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Where,

n = sample size required.

Z = Z score at confidence level (95% level of confidence) = 1.96.

P = 2010 National prevalence of childhood immunization uptake (87% =0.87). Derived from literature.

d = Margin of error (5% =0.05).

Substituting,

n= [(1.96)2 (0.87 × 0.13)] / (0.05)2 =174.

3.6 Pre-testing

The questionnaire for the study was pre-tested in Akosombo Township. This helped in identifying errors and re-structuring of the questionnaire.

3.7 Data Handling

The data collected on each respondent was cross checked after each day's field work to ensure that the questionnaire were completely and appropriately filled and all information accurately collected. The administered questionnaires were cleaned, coded and entered into Microsoft Excel. The data was validated and exported to STATA Statistical software package (*StataCorp.2007. Stata Statistical Software. Release 14*. Stata Corp LP, College Station, TX, USA) for analysis.

3.8 Data analysis

Descriptive analysis was carried on the socio- demographic characteristics of study participants and to determine knowledge and attitude towards immunization whilst Pearson's chi-square test was conducted at 95% confidence interval (CI) to establish associations between mothers' awareness and immunization of their children. Statistical significance was considered at 95% confidence interval and p-values less than 0.05 ($p<0.05$). The results were presented in tables, graphs and charts.

3.9 Ethical Consideration

To ensure that the research meets ethical standards, ethical approval was sought and obtained from the Ensign College of Public Health Ethics Review Board. Also, an administrative approval was sought from the District Health Directorate. A consent form stating the purpose of the study was attached to each questionnaire and explained to the respondent before they were allowed to sign

and participate in the exercise. The consent form clearly stated issues of confidentiality and anonymity to the respondent as well as risk and benefits of the study.

3.10 Limitations of the study

The study participants were recruited from five out of the six sub-districts of the Asuogyaman district due to challenges encountered during the data collection stage. Thus, the findings could not be generalized as true reflection of the entire Asuogyaman district given the small size of the sample used. Also, responses on immunization statuses of children were mostly by verbal confirmation rather than immunization cards. As a result, findings on immunization statuses of the children could be misleading due to false confirmation by mothers.

3.11 Assumptions

The following assumption was made in the study: Vaccines for all the vaccine preventable childhood diseases were available in the Asuogyaman district in all the immunization centers.

CHAPTER FOUR

4.0 RESULTS

4.1 Introduction

This chapter presents the results of the empirical study. There are seven sections in this chapter.

4.2 Demographic characteristics of study participants

There was a 100% response rate in terms of the questionnaires administered since they were interviewer administered. Of the 174 mothers who participated in the study, majority, 98 (56%) were within the age range of twenty-one years to thirty years, whilst 51 (29%) fell between ages thirty-one and forty years. Only 8 (5%) of the mothers were above forty years.

Also, most, 154 (89%) of the respondents professed faith in Christianity, 17 (9%) reported being Muslims with only 3 (2%) of the mothers acknowledged being practitioners of the African Traditional Religion. In terms of marital status of the mothers, 135 (78%) of the mothers were married, 27 (15%) were single, 9 (5%) were co-habiting whilst 3 (2%) were either divorced or separated at the time of the study.

While 71 (41%) of the mothers reported being Ewes, 64 (37%) are Akans and 33 (19%) are Ga/ Adangme. Only 2 (1%) of the mothers are Hausa. On the highest attained level of formal education at the time of the study, most of the mothers 89 (51%), had Middle/Junior High School education, 40 (23%) had Senior High School/ Vocational education, 13 (7%) had primary school education

while 21 (12%) and 11 (6%) had tertiary level education and no formal education respectively. Majority 138 (79%) of the mothers had between one and three children, 34 (20%) had between 4 and six children whilst only 2 (1%) of the mothers had seven children and above. Table 4.1 shows details of the demographic characteristics of the study respondents.

Table 4.1: ***Socio-demographic characteristics of study participants***

Variable	Frequency	Percent (%)
Age		
15-20	17	10
21-30	98	56
31-40	51	29
41-49	8	5
Marital Status		
Single	27	15
Married	135	78
Divorce/Separated	9	5
Co-habiting	3	2
Ethnic Group		
Akan	64	37
Ga-Adangme	33	19
Ewe	71	41
Hausa	2	1
Others	4	2
Educational level		
None	11	6
Primary	13	8
Middle/JHS	89	51
SSS/Vocational	40	23
Tertiary	21	12
Religion		
Christianity	154	89
Islam	17	10
Traditional	3	1
Number of Children		
1-3	138	79
4-6	34	20
7 Above	2	1

4.3 Awareness of Childhood Immunization

In order to determine mother's level of awareness of childhood immunization, they were asked to indicate "Yes" or "No" to the question if they have ever head of childhood immunization. Most 168 (97%) of the mothers who took part in the study indicated Yes while only 6 (3%) indicated No. With regards to sources of information on immunization, the health facility was the major source through which mothers were aware of immunization 93 (53%). This was followed by the Radio/Television 48 (28%), with only 13 (7%) mothers indicated Newspaper as their source of information on immunization as shown in Figure 4.1.

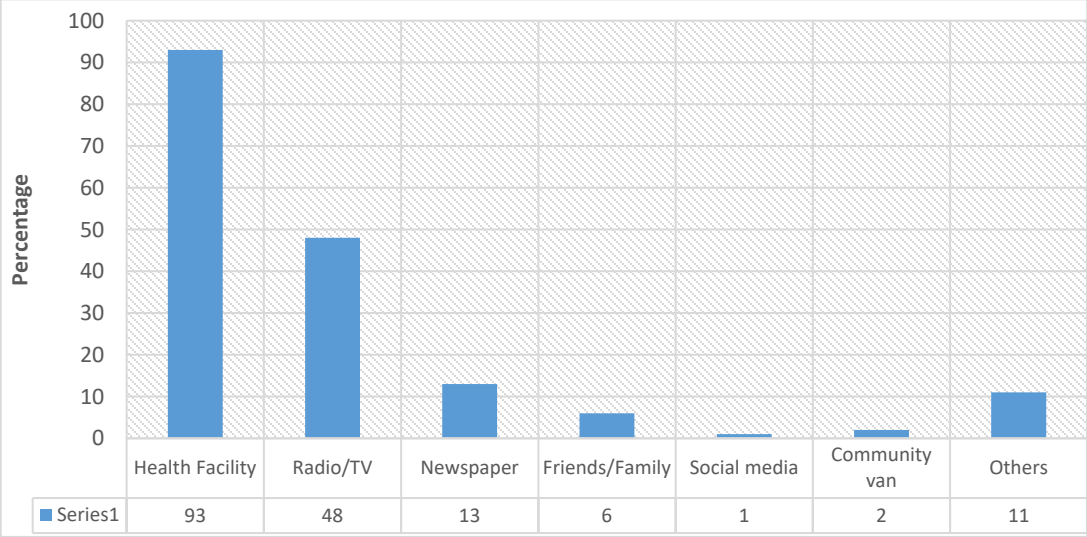

Figure 4.1: *Sources of information on immunization*

4.4 Awareness Level and demographic characteristics of respondents

A Pearson's Chi-square test was performed at 95% confidence interval to determine the level of association between mothers' awareness of immunization and their demographic characteristics. The results showed that ethnic group of mothers was statistically associated with awareness of

immunization. However, age, marital status, educational level, religion and number of children of mothers were not statistically associated with awareness of immunization as shown in table 4.2 below.

Table 4.2: Bivariate analysis between Awareness level and demographic characteristics

Variable	Frequency	Awareness of immunization		P-Value
		Yes	No	
Age				
15-20	17	15 (89)	2 (11)	0.176
21-30	98	86 (88)	12 (12)	
31-40	51	51 (100)	0 (0)	
41-49	8	8 (100)	0 (0)	
Marital status				
Single	27	27 (100)	0 (0)	0.103
Married	135	123 (91)	12 (9)	
Divorced/Separated	9	9 (100)	0 (0)	
Co-habiting	3	2 (71)	1 (29)	
Ethnic group				
Akan	64	63 (98)	1 (2)	**0.010**
Ga/Adangme	33	33 (100)	0 (0)	
Ewe	71	57 (80)	14 (20)	
Hausa	2	2 (100)	0 (0)	
Others	4	4 (100)	0 (0)	
Educational level				
None	11	9 (82)	1(18)	0.652
Primary	13	12 (92)	1 (8)	
JHS	89	83 (93)	6 (7)	
SHS	40	40 (100)	0 (0)	
Tertiary	21	21 (100)	0 (0)	
Religion				
Christianity	154	140 (91)	14 (9)	0.801
Islam	17	17 (100)	0 (0)	
ATR	3	3 (100)	0 (0)	
Number of Children				
1-3	138	131 (95)	7 (5)	0.500
4-6	34	32 (94)	2 (6)	
7 Above	2	2 (100)	0 (0)	

4.5 Decision making on immunization

All mothers in the study responded to a question on decision making in terms of immunization. Of the 174 respondents, 139 (80%) reported that decision on immunization of the children are made by them. However, 2 (1%) of mothers indicated that other people take immunization decisions for them as shown in Figure 4.2.

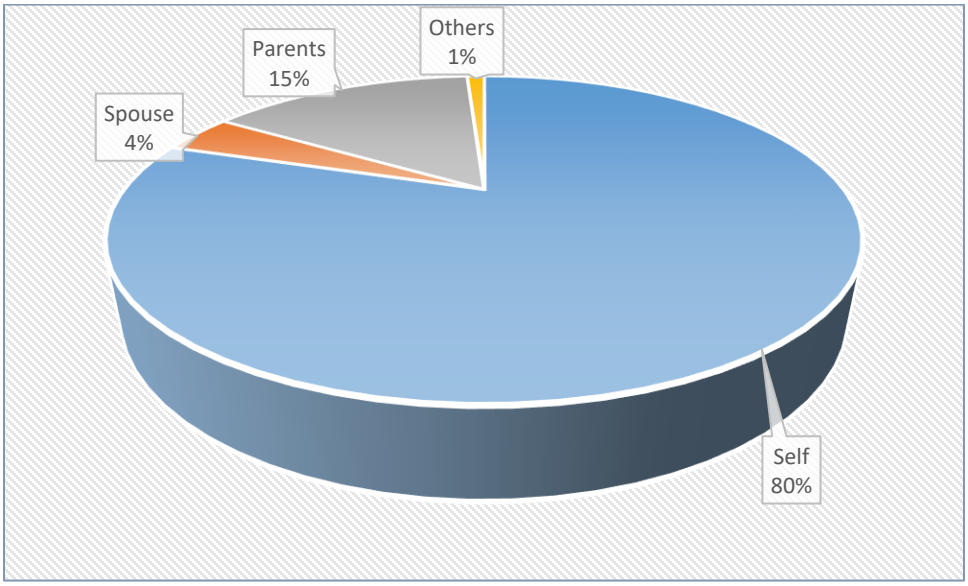

Figure 4.2 *Decision making on immunization*

4.6 Knowledge of six Childhood killer diseases

The knowledge of study respondents with respect to the six childhood killer diseases was assessed. Majority 145 (83%) of the mothers mentioned Polio as one of the six childhood killer diseases. This was followed by measles 136 (78%) and the least reported of the diseases was Diphtheria 34 (20%). Figure 4.3 shows details of mothers' knowledge of the six childhood killer diseases.

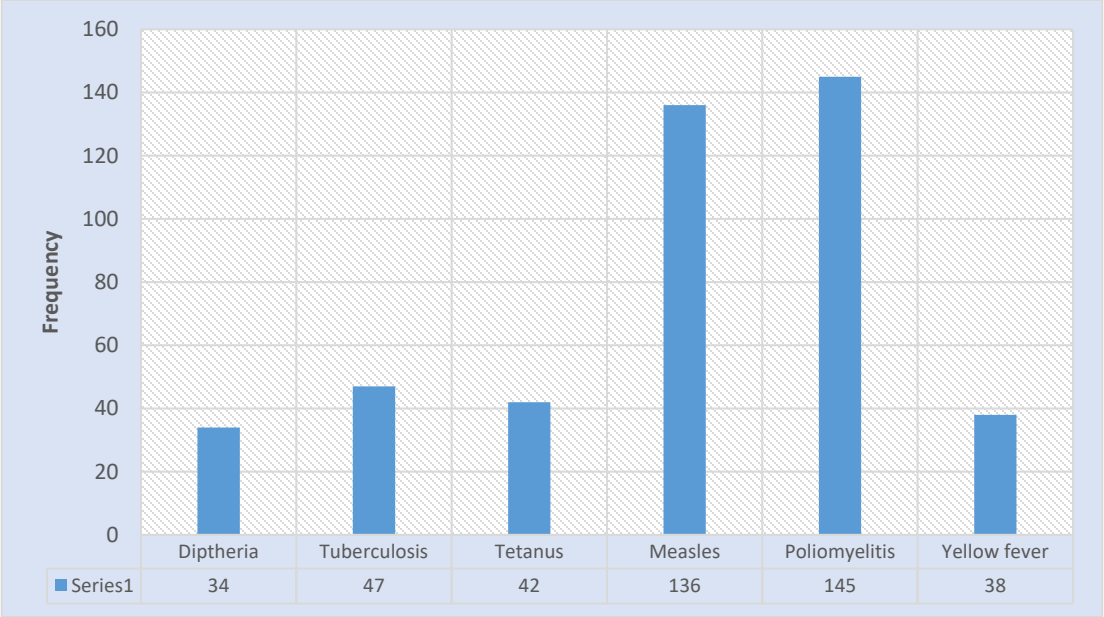

Figure 4.3: *Knowledge of six childhood killer diseases*

Also, among the five different clusters of sub district from which the study participants were drawn, the Akosombo sub-district has the highest 28(80%) percentage of women with knowledge on the six childhood killer diseases. This was followed by the Akwamufie/Apegusu sub-district 23(66%) whilst the Atimpoku sub-district has the lowest number of women with knowledge on the six childhood killer diseases as shown in Figure 4.4.

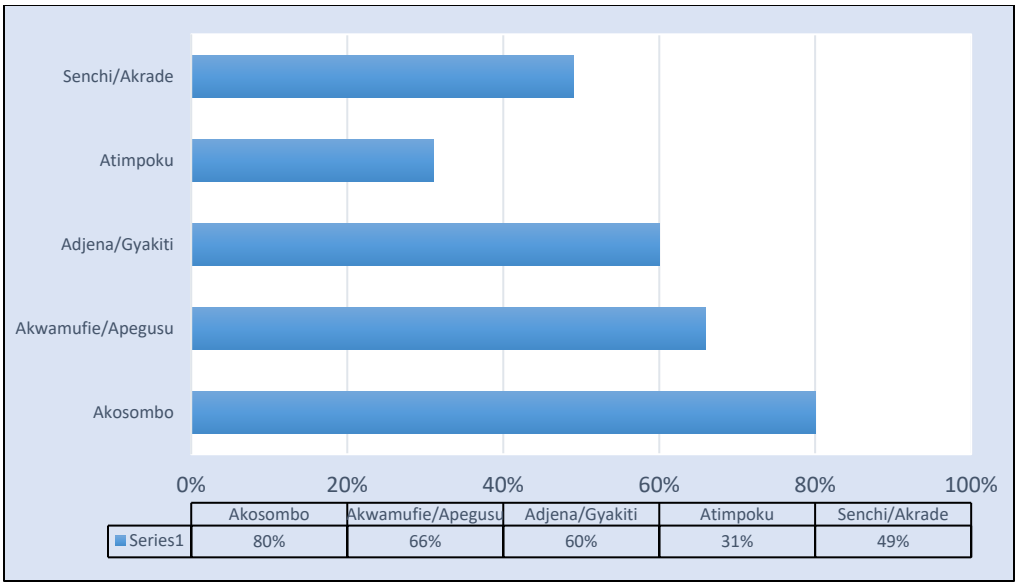

Figure 4.4: *Knowledge of six childhood killer diseases by sub districts*

4.7 Knowledge of immunization and prevention of childhood diseases

In assessing mothers' knowledge of immunization, the study found widespread knowledge among mothers with respect to prevention of childhood diseases through immunization. Most 155 (89%) of the mothers reported that immunization prevents childhood diseases whilst only 4 (2%) mothers were undecided as to whether immunization prevents childhood diseases or not as shown in Figure 4.5

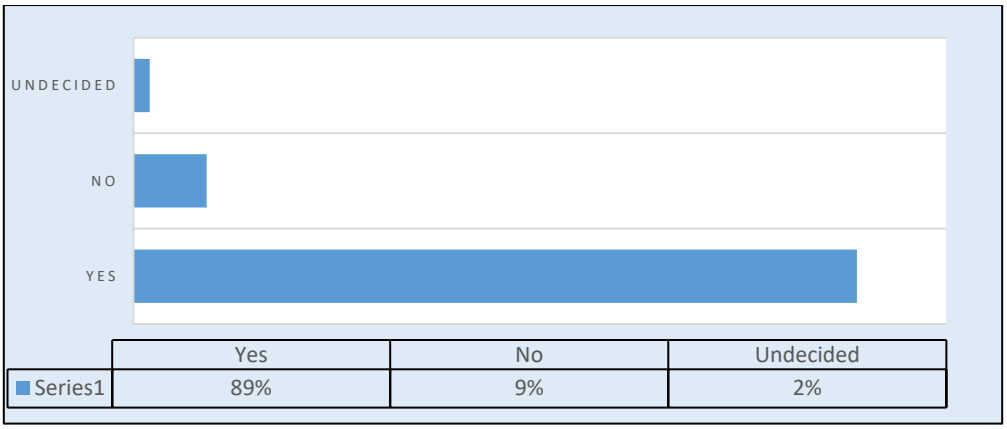

Figure 4.5: *Knowledge of prevention of childhood diseases through immunization*

Also, the knowledge of mothers about immunization of their children was assessed on a number of issues pertaining to immunization. The findings are presented in table 4.3below.

Table 4.3: Knowledge of mothers about immunization of children

Variable	Frequency	Percentage (%)
Knowledge of need for immunization	146	84
Knowledge about contraindications	12	7
Knowledge of place or time of immunization	91	52
Knowledge of need for follow up doses	87	50
Knowledge of doses given at each interval	9	5

4.8 Knowledge levels of mothers about immunization

The knowledge of mothers regarding immunization was classified into levels of no knowledge, low knowledge, average knowledge and high knowledge depending on their ability to mention the vaccine preventable six childhood killer diseases. Mothers who were able to mentioned 5-6 of the six childhood killer diseases were classified as having high knowledge, those who were able to mentioned 3-4 diseases were classified as having average knowledge, those who mentioned 1-2 diseases were classified as having low knowledge whilst those who could not mention any of the six childhood killer diseases were classified as having no knowledge. The results as shown in Figure 4.6 indicates that only 4 (2%) of the mothers have high knowledge whilst 35 (20%) could not mention any of the vaccine preventable six childhood killer diseases and thus classified as having no knowledge.

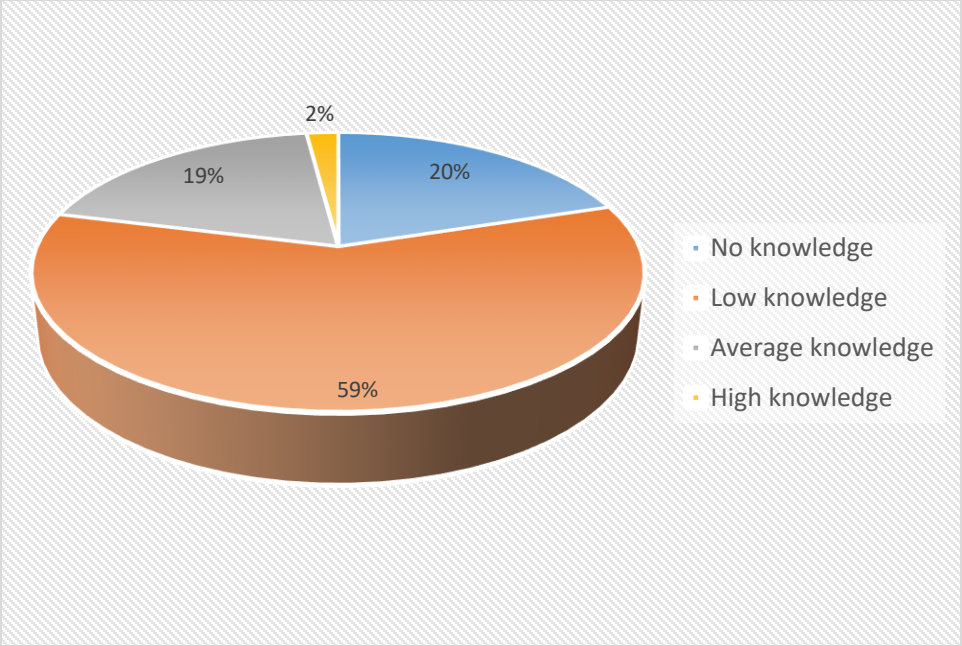

Figure 4.6: Knowledge levels of mothers about immunization

4.9 Immunization status of children

More than half 93 (53%) of the mothers who participated in this study indicated that they have fully immunized their children. 67 (39%) of the mothers have partially immunized their children whilst 14 (8%) said they have not immunized their children as shown in Figure 4.7.

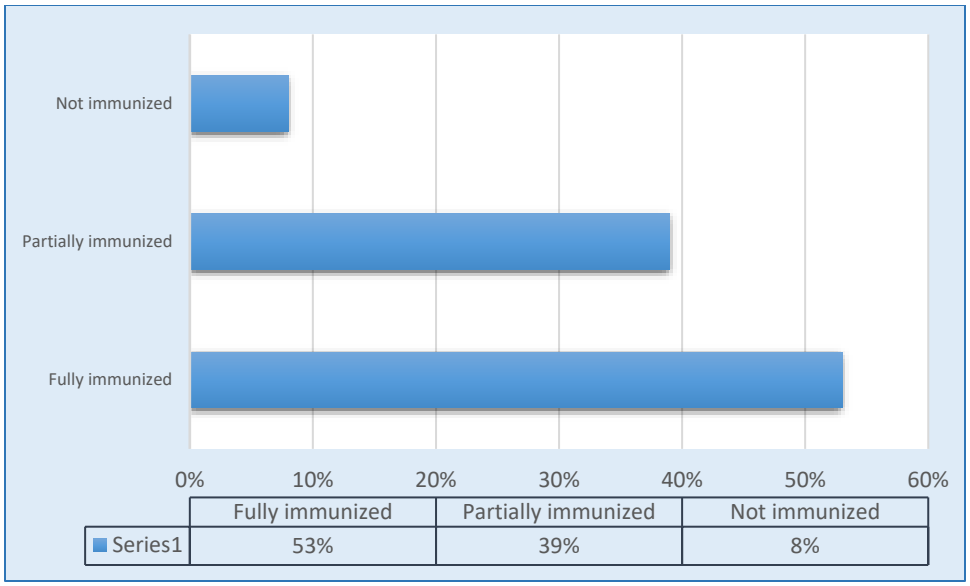

Figure 4.7: *Immunization status of children*

4.10: Knowledge of mothers and immunization status of children

A chi-square test was done at 95% confident interval to determine any relationship between mother's knowledge and immunization status of their children. There was no significant association between mother's level of knowledge and immunization status of their children.

Also among the reasons given by mothers for partially immunizing or not immunizing their children, being too busy was the prominent reason given by mothers as shown in table 4.4.

Table 4.4: Reasons for partial and non-immunization of children

Reason	Frequency	Percent (%)
Too busy	78	44
Family problem	13	7
Vaccine not available	3	2
Time for immunization not convenient	5	3
Don't believe in the effectiveness of the vaccine	1	0.1
Heard bad things about vaccines and immunization	4	2
Not aware of immunization	6	3
Long queues and waiting time at immunization centers	32	18
Not aware of need for follow up doses	28	16
Did not know schedule and place of immunization	2	1
Side effects	3	2

4.11: Side effects of immunization

Mothers reported on side effects noticed after immunization of their children. Findings revealed that 45 (26%) of the mothers reported "felt ill or tired, fever on day of injection" as the commonest side effect observed in their children after immunization. Table 4.5 presents details of the different side effects reported by study participants.

Table 4.5: Side effects of immunization

Side effect	Frequency	Percent (%)
Felt ill or tired, fever on day of immunization	45	26
Hives, Swelling	23	13
Mumps/rash/itching	2	0.1
Redness at site of injection	7	4
Seizures	0	0
Vomiting/diarrhea	0	0
Shortness of breath	0	0
Eye irritation	0	0
Others	0	0

4.12: Attitude of mothers towards immunization

The general attitude of mothers towards immunization of their children was determined using a range of questions. The results showed that majority of mothers in the study have positive attitude towards immunization as 123 (71%) of mothers see immunization as a good thing for their children and will encourage their colleagues to immunize their children However, some mothers were uncertain with respect to their attitude towards immunization of their children as shown in Figure 4.8.

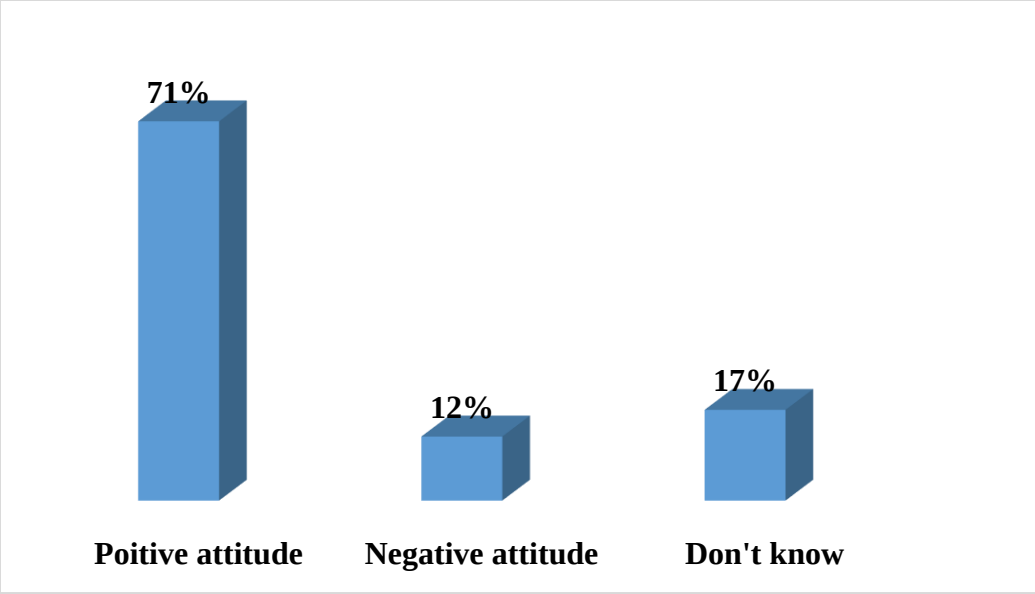

Figure 4.8: Attitude of mothers towards Immunization

4.13: Practices influencing uptake of immunization

Mothers were asked to indicate practices that affect their behavior towards immunization of their children. The results are shown in Table 4.6.

Table 4.6: Practices influencing uptake of immunization

Practice	Frequency	Percent (%)
Frequent unavailability of vaccines	17	10
Frequent absence of vaccinator	8	5
Inconvenient time for immunization	83	48
Cultural or religious background	26	15
Long waiting time	104	60

4.14: Accessibility of immunization centers

Most mothers consider immunization centers as accessible and not far from them. Of the 174 mothers who responded to questions on accessibility of immunization centers, 114 (66%) of them regarded the immunization centers as accessible and not far from them as shown in Figure 4.9.

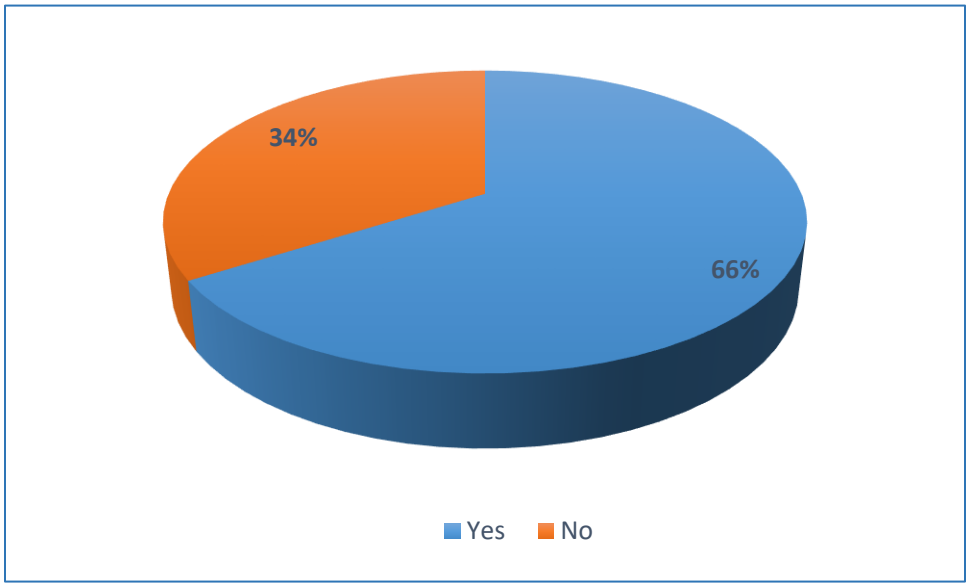

Figure 4.9: *Accessibility of immunization centers*

Also, the hospital was identified as the major source of immunization with 98 (56%) of mothers indicating that the hospital is their source of immunization for their children. This was followed by outreach programs with 36 (21%) as shown in Figure 4.10.

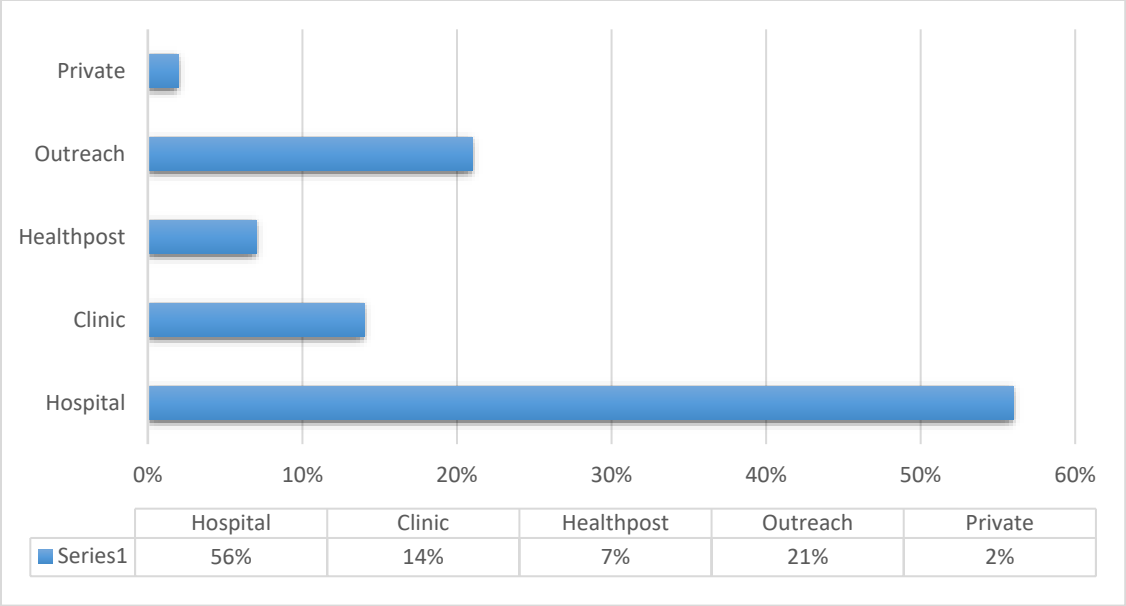

Figure 4.10: *Source of immunization*

Determinants of immunization uptake

A bivariate analysis was done to identify the independent variables associated with immunization status. The results showed that access to immunization center and Ethnicity were significantly associated with immunization status as shown in Table 4.7.

Table 4.7: Bivariate analysis between selected independent variables and immunization status

Variable	Immunization Status			P-value
	Full	Partial	Don't Know	
Age of Mother				
15-20	7(41)	7(41)	3(18)	0.542
21-30	49(50)	42(43)	7(7)	
31-40	30(59)	18(35)	3(6)	
41-49	6(74)	1(13)		
	1(13)			
Source of information				
Health Facility	53(57)	38(41)	2(2)	0.993
Radio/TV	25(52)	20(42)	3(6)	
Newspaper	6(46)	4(31)	3(23)	
Friends/Family	3(50)	1(17)	2(33)	
Social Media	1(100)	0(0)	0(0)	
Community Van	0(0)	1(50)	1(50)	
Others	4(36)	4(36)	3(28)	
Attitude towards Immunization				0.608
Positive	78(63)	40(32)	6(5)	
Negative	9(43)	8(38)	4(19)	
Don't Know	5(17)	20(69)	4(14)	
Access to Immunization center				**0.043**
Yes	62(54)	49(43)	3(3)	
No	30(50)	19(32)	11(18)	
Educational level				
None	7(64)	3(27)	1(9)	0.799
Primary	6(46)	5(38)	2(15)	
Middle/JHS	54(61)	31(35)	4(4)	
SHS/Vocational	18(45)	21(53)	1(2)	
Tertiary	7(33)	8(38)	6(29)	
Religion				

Christianity	88(57)	61(40)	5(3)	0.956
Islam	3(18)	6(35)	8(47)	
Traditional	1(33)	1(33)	1(34)	
Ethnicity				
Akan	41(64)	19(30)	4(6)	0.048
Ga-Adangme	22(67)	9(27)	2(6)	
Ewe	25(35)	38(53)	8(12)	
Hausa	1(50)	1(50)	0(0)	
Others	3(75)	1(25)	0(0)	

CHAPTER FIVE

5.0 DICUSSION

The study assessed the determinants of immunization uptake among mothers of the Asuogyaman district of the Eastern Region of Ghana. In terms of socio-demographic characteristics, the general age of the study participants could be described as youthful as most (56%) of them were within the age range of 21-30 years. The dominant religion of the respondents was Christianity (88%) and this is consistent with reports by the Ghana Demographic Health Survey that, Christianity is the dominant religion of Ghana. Even though the study location was in the eastern region, a region dominated by the Akan ethnic group, the study found majority (41%) of the participants to be Ewes with 37% being Akan. This could be due to the close proximity of the study location to the Volta Region.

In terms of knowledge and awareness of immunization, all most all 168 (97%) of the mothers have heard about immunization. This is similar to studies done in Ethiopia on assessment of child immunization coverage and determinant which found that majority 573 (97%) of mothers have ever heard about immunization(Legesse & Dechasa, 2015). Another study found that, of the total respondents, about 96% heard about vaccination and vaccine preventable diseases (Etana & Deressa, 2012). The health care facility emerged in this study as the main source of information on immunization with 93 (53%) of the mothers reporting it as their source of information. This however, contradicts results of studies from Siana District of Ethiopia which reports Health Extension Workers as the major source of information on immunization for mothers (Legesse & Dechaasa, 2015). Which could in such settings, the mothers were being reached by the Extension

Workers who like their counterparts in the agricultural sector rather reach out to their clientele than waiting for them to visit the facility.

The study found that only ethnic group of mothers as a background characteristics of study respondents was significantly associated with awareness of immunization whilst educational level, religion, number of children born, marital status and age were not statistically associated with awareness of immunization. A study in Cameroon, however, found educational level and income level of mothers as being associated with awareness of immunization(Russo *et al*., 2015). These differences in findings could be due to differences in ways of carrying out immunization. For instance, most health educations including immunization are mostly done in the Akan language which is the popular and common language of communication in Ghana. Thus, a mother who is Akan is likely to be aware of immunization compared to a mother who is not Akan and does not understand the Akan language.

Also, in a bivariate analysis, access to immunization center and ethnicity of mothers were found to be significantly associated with immunization status of their children. This is however, not surprising since access to immunization service provision avenues has been consistently been reported as a predictor to immunization uptake (Etana & Deressa, 2012; Adedire *et al*., 2016).

In addition, the knowledge of mothers on immunization was assessed and the findings revealed that, most 155 (89%) of the mothers know that immunization prevents vaccine preventable diseases among their children. Vonasek *et al*., (2016), in their study in Uganda found that majority of mothers were able to state that childhood immunizations protect children from diseases (93.5%). Also, in Ethiopia, studies showed that the majority of respondents (79.5%) knew that the objective of immunizing children was to prevent disease(Etana & Deressa, 2012). However, their knowledge

in naming the six childhood killer diseases was generally low. Only 4 (2%) of the mothers could mention between 5-6 of the six childhood killer diseases and were classified as having high knowledge whilst majority 103 (59%) of the mothers mentioned between 1-2 of the six childhood diseases and hence were classified as having low knowledge. This difference in knowledge of mothers in terms of immunization preventing vaccine preventable diseases and knowledge of the six childhood killer diseases could be attributable to the fact that majority of the mothers had primary level of education. As a result, their ability to recall all the six childhood killer diseases will be less compared with their ability to recall education given to them on the fact that immunization prevents vaccine preventable diseases. Meanwhile, a study in Ethiopia reveals that overall more than two-third, 421(71.2%) of mothers in their study were knowledgeable (have good on vaccine preventable diseases) (Legesse & Dechasa, 2015). The large sample size of 591 used in their study could be accountable for the difference compared to the small sample size of 174 used in this study. Poliomyelitis 145 (83%) was the highly known six childhood disease among the mothers and this was followed by measles 136 (78%). This agrees with a study in Uganda which showed that the most common vaccine preventable diseases identified were polio (81.3%) and measles (77.5%) *(*Vonasek *et al.,* 2016). The easily recognizable physical manifestations of the signs of these diseases could be responsible for the ease with which mothers remember them. Also, contrary to expectation that knowledge level of mothers in terms of immunization will influence the immunization of their children, the study found that level of knowledge of mothers was not associated with immunization status of their children. A study by Vonasek *et al*., (2016), reported similar findings in Uganda that mothers level of knowledge regarding vaccination and immunization was not significantly associated with immunization of their children. This contradicts findings from other studies which showed that knowledge of mothers and caregivers

on immunization against vaccine preventable diseases was associated with immunization of their children(Legesse & Dechasa, 2015). Also, in Nigeria a study found that maternal knowledge of routine immunization was a significant predictor of full immunization of children by their mothers (Adedire et al., 2016).

Moreover, majority 93 (53%) of the mothers reported that they have fully immunized their children whilst 67 (39%) have reported that they have partially immunized their children. Only 14 (8%) of the mothers reported that they have not immunized their children. These findings in terms of percentages of fully immunized children are far lower than results of studies in Cameroon which found that 84.5% of the children were fully immunized by their children with only 15.5% of the children being partially immunized by their mothers(Russo *et al*., 2015). Another study in Nigeria also found 82.3% of the children in the study were fully immunized (Odusanya *et al.*, 2008). Study participants were also asked to indicate reasons responsible for their partial and non- immunization of their children. "Too busy" was the most prominent reason cited by study participants as being responsible for their partial and non-immunization of their children. This is similar to other studies which found that among partially immunized children, the main reported mothers' reason for not being able to vaccinate their children was "to be very busy"(Russo *et al*., 2015). However, Vonasek *et al*., (2016), found that in Uganda, the two most common reasons given by mothers for partial or non-immunization of their children were "fearful of side effects" and "ignorance/disinterest/laziness,".

Furthermore, mothers reported side effects of immunization in this study. The most reported side effect by mothers was that their felt ill or tired and had fever on day of immunization 45 (26%).

This findings disagree with studies in Nigeria which reported coughing as the most reported side effect observed by mothers after vaccination of their children (Odusanya et al., 2008).

The attitude of mothers towards immunization is expected to drive mothers' immunization of their children. This study assessed the general attitude of mothers towards immunization and results showed that majority 123 (71%) of the mothers saw immunization as beneficial to their children. Thus, the overall attitude of study participants towards immunization was positive. This is in conformity with studies on attitude of mothers towards childhood immunization which revealed that 95.7% stated that it is very important. Also, in Nigeria, Odusanya *et al*., (2008), found that most mothers had very positive attitudes towards immunization and almost all (99.1%) felt that immunization was beneficial.

In addition, most 114 (66%) of the mothers regarded the immunization centers as accessible and not far from them. Even though most mothers considered the immunization centers as not far from them, most 104 (60%) of the mothers identified long waiting time as the leading factor influencing their uptake of immunization. This was followed by inconvenient time for immunization 83 (48%) whilst the hospital was identified as the main source of immunization by study participants.

Majority 139(80%) of the mothers reported that they take decisions on immunization of their children. But 15% (26) of the mothers indicated that their parents take decision on immunization of their children. This is not surprising considering the fact that in the Ghanaian society just like many African settings grandparents particularly grandmothers of children are highly involved in the upbringing of children.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The findings from this study indicates that knowledge and awareness of immunization is high among mothers with children under five years of age in the Asuogyaman District of the Eastern Region of Ghana. Also, the general attitude of mothers towards immunization is positive. However only a little over half (56%) of the mothers have fully immunized their children. This implies that knowledge and awareness as well as positive attitude towards immunization alone may not be enough in getting mothers to immunize their children.

Most of the mothers indicated that Immunization centers are accessible to mothers and the health facility was the widely reported source of information on immunization for the mothers. The ethnic group of mothers was found to be associated with their awareness of immunization.

Decision making with regards to immunization of children is taken mostly by the mothers themselves. Meanwhile, the parents of some mothers take decision for some of the mothers on immunization of their children.

All the mothers have knowledge of at least one of the six childhood killer diseases. But Poliomyelitis was widely known among the mothers. The mothers of the Akosombo sub-district of the Asuogyaman district have high knowledge compared with other sub-districts. However, 89% (155) of the mothers know that immunization of their children helps to prevent the occurrence of these six childhood killer diseases. Mothers are also aware of where to obtain immunization services as well as the need for follow up immunization services. But the mothers identified long

waiting time at immunization centers, busy schedules on their part and inconvenient immunization arrangements as factors constraining their uptake of immunization.

Only few of the mothers 26% (45) reported noticing side effects on their children after immunization whilst majority of them reported no side effects.

Besides, access to immunization centers and Ethnicity of mothers were significantly associated with immunization status of their children.

6.2 Recommendations

The findings of the study have implications for immunization services of the Asuogyaman district. Thus the following recommendations should be implemented in order to improve on immunization service provision in the district: However future research work can adopt a qualitative approach to unearth all behavioral reasons for care givers not fully immunizing their children.

6.2.1 Asuogyaman District Health Directorate

The District Health Directorate of the Asuogyaman district should take steps to reduce waiting time at the immunization centers since mothers identifies long waiting time as a barrier to immunization uptake.

Immunization schedules should also be well planned to make them convenient for mothers to bring their children for immunization. Also immunization centers should be made more accessible since access to immunization centers is associated with immunization status.

However, the district should continue to maintain the high level of knowledge and awareness on immunization through various education mechanisms such as announcement in churches, community van and other social gatherings. Efforts should be made to conduct education of mothers on immunization in other languages other than Akan to enable other non-Akan ethnic groups to understand.

Since majority of the mothers have positive attitude towards immunization and the fact that most mothers have knowledge of at least one of the vaccine preventable diseases, it is imperative for the Asuogyaman District Health Directorate to leverage on that to deepen the knowledge and understanding of mothers on immunization and the need to take up immunization for their children.

6.2.2 Ghana Health Service

The Ghana Health Service should increase staffing numbers of Public Health Nurses and health Extension Workers in the district to enhance outreach services across the communities in the Asuogyaman district. This will help bring immunization services to the door steps of mothers in the various communities in the district in order to enhance their participation.

Advertisement place on the various mass media platforms regarding immunization should be done in other local languages in order to reach the larger section of the public.

6.2.3 Government

The government of Ghana should consider instituting an incentive package for Health Extension Workers who reach out to remote areas in order to motivate them to discharge their duties with dedication. This will also attract others to serve in these remote areas so as to ensure total coverage of immunization services in the various districts. The number of Public Health Nurses trained should be increased to ensure availability of the needed human resources to be deployed to the district levels in adequate numbers for immunization services. All manufactured vaccines must be in single vial doses to meet the need of each child, and to avoid delaying mothers at the weighing centers, because of multiple vial dosages which need to get about 5 to 10 babies before a vaccine can be open which also lead to long waiting time and vaccine wastage.

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Appendix

Appendix A: Consent Form

Project Title: Determinants of uptake of immunization among mothers with children under five years of age in the Asuogyaman district of the eastern region of Ghana.

Introduction

My name is Mary Annang. I am a student pursuing Masters in Public Health at Ensign College of Public Health and I am the principal investigator of this study.

You are warmly invited to take part in the study. But before you make a decision to take part in the study or not, I would like you to read this consent or will read it to you to guide you in making your decision.

Procedures

You will be answering questions about immunization of your child/children. There will be no coercion to obtain response from you. This is purely an academic research, which forms part of the requirements for the award of a Masters degree in Public Health. It will be appreciated if you could participate in this study.

Risk and Benefits

There will be no harm and costs for participating and there will be no payments awarded for participating in this research. However, your response will help in coming out with the true picture of determinants of childhood immunization uptake in the Asuogyaman district to aide in policy decision making and implementation. The only cost you will incur will be the time taken to answer the questionnaire.

Confidentiality and Anonymity

Every piece of information you provide will be held in absolute confidence. Data collected in this study are strictly protected.

Right to Refuse

Participation in this study is entirely voluntary and you can choose not to answer any individual question or all the questions. You are at liberty to withdraw from the study at any point in time of the study. However, I will encourage you to fully participate in the study since your opinions are important to help assess the subject matter under investigation.

Ethical Approval

The study has been reviewed and approved by the Ethical Review Committee of the Ensign College. This committee is there to ensure that participants in research are protected from harm and their rights are respected.

Participant's Consent

I have read the foregoing information / the foregoing information has been read to me or translated to me in a language that I understand and I have fully understood it. I consent voluntarily to participate in this study.

(Name and signature of a witness should be provided in a case where the participant cannot speak or read English).

Signature/thumbprint: _____

Name of witness: _____

Signature/thumbprint of witness: _____

Interviewer's Statement

I, the undersigned (your name), have explained this consent form to the participant in simple language that she/he understands, clarified the purpose of the study, procedures to be followed as well as the risks and benefits involved. The participant has freely agreed to participate in the study.

Signature of interviewer ……..

Date ……. / …….. / …….

Address

Akosombo Hospital

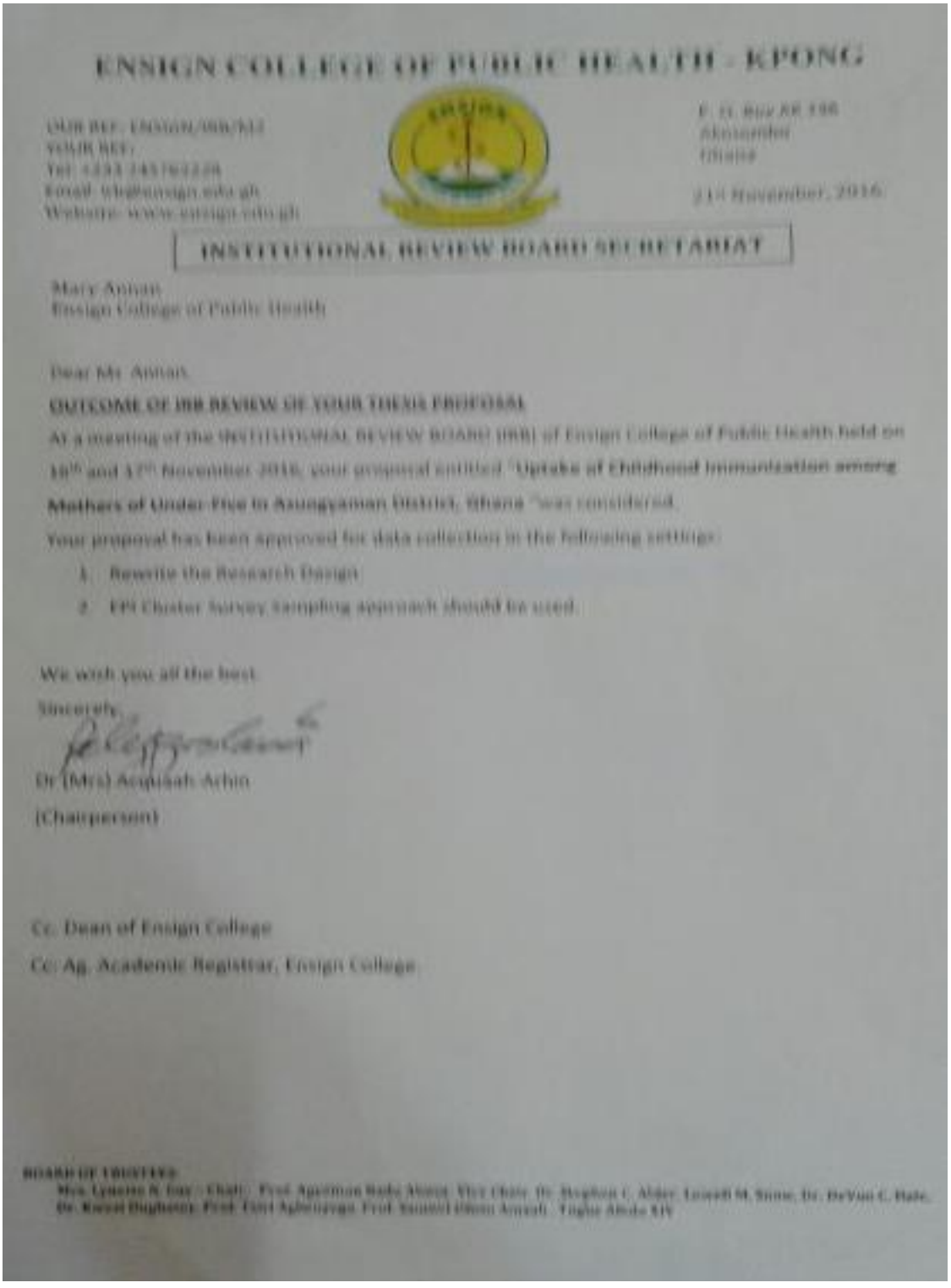
Akosombo.

Telephone number:

Email address: 0543226355

In case of any concern you can contact me on 0543226355

Appendix A1: IRB Form



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21st November, 2016

INSTITUTIONAL REVIEW BOARD SECRETARIAT

Mary Annan
Ensign College of Public Health

Dear Mr. Annan

OUTCOME OF IRB REVIEW OF YOUR THESIS PROPOSAL

At a meeting of the INSTITUTIONAL REVIEW BOARD (IRB) of Ensign College of Public Health held on 16th and 17th November 2016, your proposal entitled "**Uptake of Childhood Immunization among Mothers of Under Five in Asuogyaman District, Ghana**" was considered.

Your proposal has been approved for data collection in the following settings:

1. Rewrite the Research Design
2. EPI Cluster Survey Sampling approach should be used

We wish you all the best.

Sincerely,

Dr (Mrs) Acquisah-Achin
(Chairperson)

Cc: Dean of Ensign College
Cc: Ag. Academic Registrar, Ensign College

BOARD OF TRUSTEES
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Appendix B: Questionnaire/Assessment tool

SECTION A:

Demographic characteristics:

Instructions: *Kindly tick (✓) the appropriate box and fill in the appropriate answers to the ensuing questions where applicable*

1. Age of respondent ……

2. Which religion do you belong to?
- **a.** Christian [ ]
- **b.** Islam [ ]
- **c.** Traditional [ ]
- **d.** Others ……

3. What is your ethnic group?
- **a.** Akan [ ]
- **b.** Ga/Adangme [ ]
- **c.** Ewe [ ]
- **d.** Hausa [ ]
- **e.** Others…….. ……

4. What is your highest level of education?
- **a.** None [ ]
- **b.** Primary [ ]
- **c.** Middle/JSS [ ]
- **d.** SSS/SHS/Vocational [ ]
- **e.** Tertiary [ ]

5. What is your primary occupation?

- **a.** Business/Trader [ ]
- **b.** Corporate worker [ ]
- **c.** Housewife

d. Farmer [ ]

e. Student

f. Other …….

6. What is your marital status?

a. Single [ ]

b. Married [ ]

c. Divorced/ Separated [ ]

d. Widow [ ]

e. Co-habiting [ ]

7. What is <u>your spouse's level</u> of education?

a. None [ ]

b. Primary [ ]

c. Middle/JSS [ ]

d. **SSS**/SHS/Vocational [ ]

e. Tertiary [ ]

8. What is your spouse's primary occupation?

a. Farmer [ ]

b. Fishing [ ]

c. Corporate worker [ ]

d. Trading [ ]

e. Artisan [ ]

f. Other ……..

9. How many children have you? …….....

10. Where did you give birth to your last child?

a. Hospital [ ]

b. Clinic [ ]

c. Health Centre [ ]

d. CHPS Compound [ ]

e. Maternity Home [ ]

f. Other ……

SECTION B:

Knowledge, attitude and practices of mothers towards child immunisation
Instructions: *Kindly tick (✓) the appropriate box and fill in the ensuing questions*

1. Have you ever heard about immunization? **a.** Yes [ ] **b.** No [ ]

2. What are your sources of information for childhood immunization?

   a. Health facility

   b. Radio/Television

   c. Newspapers

   d. Friends/Family

   e. Social media

   f. Community van announcement

   g. Other ……

3. In your household, who take the primary decision to immunize your child?

   a. Self [ ] **b.** Spouse [ ] **c.** Parent [ ] **d.** Others ……..

4. How much do you know about childhood vaccination schedules, and general vaccine facts? **a.** None [ ] **b.** Very Little [ ] **c.** Average [ ] **d.** Much [ ]

5. Immunization prevents childhood disease. **a.** Yes [ ] **b.** No [ ]

6. What are the six childhood killer diseases? **(List as many as you can)**

   i. ……

   ii. ……

   iii. ……

1. Have you completed all the required immunizations for your baby? **a.** Yes [ ] **b.** No [ ]

2. If **NO** to Q.6 above**,** why? ***(Check all provided answers in the table below)***

REASONS FOR NOT COMPLETING IMMUNIZATION	CHECK ☑
Too busy	[ ]
There was a family problem	[ ]
The vaccine was not available	[ ]
The time for immunization was not convenient	[ ]
I postponed going until another time	[ ]
Don't believe in the vaccine	[ ]
Heard bad things about immunization	[ ]
Was not aware of the need for immunization.	[ ]
Long queue and waiting time	[ ]
Wasn't aware of the need for a second or third dose	[ ]
Did not know the place and time for immunization	[ ]
Lack of money	[ ]

3. Have you ever noticed any side effect in your child after immunization?

SIDE EFFECT	CHECK ☑
Felt ill or tired, fever on day of injection	[ ]
Hives, swelling	[ ]
Mumps/rash/itching	[ ]
Redness at the injection	[ ]
Seizures	[ ]
Vomiting/diarrhea	[ ]
Shortness of breath	[ ]
Eye irritation	[ ]
Other	[ ]

Child number in cluster		1	2	3	4	5	6	7	**TOTAL**
Sex (M/F)									
Immunization status	a. Fully immunized								
	b. Partially immunized								
	c. Not immunized								
Immunization providers	a. Hospitals								
	b. Clinics								
	c. Health post								
	d. Outreach								
	e. Private								
	Mothers knowledge about child immunization	1. Knowledge of need for immunization?								
		2. Ideas about contra-indications?								
		3. Knowledge of place or time of immunization?								
		4. Knowledge of need to return for 2nd and 3rd dose?								

		5. Knowledge of the doses given at each interval?									
		6. Knowledge of six child killer diseases?									
	Attitudes affecting mothers concerning child immunization	1. Fear of side effects?									
		2. immunization status of child?									
		3. Postponement of child's vaccination to a later date?									
		4. Family problems and illness of mothers?									
		5. Prompt immunization of child?									
	Practices affecting mother's behavior towards child immunization	1. Frequent unavailability of vaccines?									
		2. Frequent absence of vaccinator?									
		3. Inconvenient time for immunization?									
		4. Cultural or religious background?									
		5. Child ill, brought but not given immunization?									
		6. Long waiting time?									

		7. Attend immunization centre with a card?								
	Accessibility	1. Place of immunization too far?								

Tally of households visited: _____

Name of interviewer: _____

Signature: _____

Figure 1.2: Map of Asuogyaman District showing some Major Settlements

Source: K. Opoku-Antwi, 2011