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INTEGRI PROCEDAMUS

**FACTORS INFLUENCING IMMUNIZATION COVERAGE IN THE
LEDZOKUKU-KROWOR MUNICIPALITY – GREATER ACCRA REGION**

BY

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DECLARATION

I, DORCAS DADZIE, declare that with the exception of all scholarly materials, which have been duly acknowledged, this research was carried out completely by me, under supervision.

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Date:.....

Date.....

DEDICATION

This work is dedicated to my husband Mr. Frank Eduah, my children Jacqueline and Hillary, and my parents Mr and Mrs J. H. Dadzie Snr for their support and encouragement. It is also dedicated to all mothers/caregivers who helped in diverse ways to making this research a success.

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LIST OF ABBREVIATIONS

ANC	Antenatal Care
BCG	Bacillus Calmette-Guérin
CI	Confidence Interval
CDC	Centre for Disease Control
DHA	District Health Administration
DHIMS 2	District Health Information and Management System 2
DHMT	District Health Management Teams
DPT 3	Third dose of Diphtheria, Pertussis, Tetanus vaccine
EPI	Expanded Programme on Immunization
GHS	Ghana Health Service
GSS	Ghana Statistical Service
IPV	Inactivated Polio Virus
LEKMA	Ledzokuku- Krowor Municipal Assembly
Men A	Meningococcal conjugate vaccine
MNT	Maternal and Neonatal Tetanus
MoH	Ministry of Health
NID's	National Immunization Days
NT	Neonatal Tetanus
OPV	Oral Polio Virus Vaccine
Penta 3	Pentavalent Vaccine
PHC	Primary Health
UCI	Universal Childhood Immunization
VPD	Vaccine Preventable Disease
WHO	World Health Organization
YF	Yellow Fever

DACF	District Assembly Common Fund
DDF	District Development Fund
UDG	Urban Development Grants
GOG	Government of Ghana
UNICEF	United Nations International Children's Emergency Fund

DEFINITION OF TERMS

- Immunization:** The process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine (WHO, 2016).
- Vaccination:** This is the administration of a vaccine to stimulate an individual's immune system in order to develop specific immunity to a disease causing organism.
- Morbidity:** Level of ill-health or diseases in a given population.
- Child Mortality:** Probability of dying between birth and exactly 5 years of age, expressed per 1,000 live births (UNICEF, 2018).
- Infant Mortality:** Probability of dying between birth and exactly 1 year of age, expressed per 1,000 live births (UNICEF, 2018).
- Fully immunized child:** A child who has received all the prescribed vaccine doses considered to protect the child from vaccine preventable diseases.
- Immunization Coverage:** The percentage of children between the ages 12 – 23 months who have been vaccinated.
- Partially immunized:** A child who has missed at least one dose of any of the prescribed antigens.
- Outreach Centre:** A place where immunisation services are carried out.

ABSTRACT

Background: Studies have shown that immunisation is among the best practices of increasing human immunity globally. However, the achievement of full coverage of immunisation in third world countries has remained a very big problem to grapple with.

Aim: The research was conducted to ascertain factors influencing immunization coverage in the Ledzokuku-Krowor Municipality in the Greater Accra Region.

Methods: The study is a cross-sectional study using quantitative method and using a multi-stage sampling technique, the investigator recruited 227 participants from communities in the municipality to participate in the research. This included mothers or caregivers of children who were aged 12 to 23 months; and who were residents of the municipality for at least one year. A structured questionnaire was designed to collect data, and analysed quantitatively using STATA Version 15. The results were displayed using frequency distribution tables, and charts. Chi-square, Fisher's exact and logistic regression model were conducted to establish association between the dependent and independent variables.

Results: It was revealed that whilst majority of the respondents understood the importance of immunization exercises, they non-the-less failed to comply because of the remoteness of the outreach centres, the lack of money to commute to-and-from the outreach centres, the time taken to access services, among others. Most importantly, the result shows that responsiveness of healthcare professionals accounted most for the hesitance of the respondents to immunize their children. Working mothers and rural dwellers also had a higher tendency of missing out on immunization schedules.

Conclusion: In the Ledzokuku-krowor Municipality of Greater Accra Region, the immunization coverage for children aged 12-23 months is high, but did not achieve the intended goal of 95%. Immunization coverage in Ghana can be enhanced when educational campaigns are intensified, and extended to remote areas. A non-formal educational scheme

can be developed at community levels to create awareness among the uneducated about the benefits of immunization and antenatal care services; as well as dangers associated with taking traditional medications during pregnancy. Finally, several outreach centres can be established across the country to resolve the problem of overcrowding during immunization exercises.

CHAPTER ONE

INTRODUCTION

1. 0. Background to the Study

As a result of the benefits to be derived from vaccination, the last week of April every year is set aside as the World Immunization Week, which aims to promote the use of vaccines to protect people of all ages against disease (WHO, 2019). The WHO (2019) notes that immunization saves millions of lives every year and is widely recognized as one of the world's most successful and cost-effective health interventions. However, there are still nearly 20 million unvaccinated and under-vaccinated children in the world today.

The importance of protecting children against vaccine preventable diseases cannot be underestimated. Studies have shown that immunization is among the best practices of increasing human immunity globally (Lakew, Bekele & Biadgilign, 2015). It is a tool for preventing and eradicating transmittable diseases. Presently, immunization has averted almost two to three million child deaths yearly worldwide (Burton et al., 2009). Burton *et al.* (2009) report that about 84% of infants were vaccinated with three doses of diphtheria globally in 2013. In this regard, over 90% of DPT coverage was maintained among developed countries like America, Europe, and Western pacific (Burton *et al.*, 2009). However, the achievement of full coverage of immunization in third world countries has remained a very big problem to grapple with (Ali *et al.*, 2015).

The World Health Organization (WHO) defined to mean that “a child has received a BCG vaccination against tuberculosis; three doses of DPT vaccine to prevent diphtheria, pertussis, and tetanus (DPT); at least three doses of polio vaccine; and one dose of measles vaccine” (WHO, 2018). Full immunization coverage has therefore, been identified as a key

performance indicator of the entire health sector, especially in sub-Saharan Africa (Abhulimhen-Iyoha & Okolo, 2012).

Jani *et al.* (2008) revealed that 28.2 percent of children had not finished the vaccination programme by two years of age, 25.7 percent had missed vaccination opportunity and 14.9 percent had been wrongly vaccinated. Reasons provided for these incomplete vaccinations were correlated with accessibility to the vaccination locations, with no education of mothers and kids born at home or outside Mozambique. On the other hand, the analysis of full immunization coverage in Ethiopia, showed that sources of information from vaccination card, received postnatal check-up within two months after birth, women's awareness of community conversation programmes and women in the rich wealth index were the predictors of full immunization coverage (Lakew *et al.*, 2015).

The 2016 immunization data showed that Ghana had reached the Global Vaccine Action Plan (GVAP) target of 90% coverage for the third dose of the diphtheria-tetanus-pertussis vaccine (DTP3) (WHO, 2018). Nonetheless, there are some teething problems confronting the attainment of the full immunization coverage (Adediran *et al.*, 2017). This assertion is in line with the 2017 report on the National Demographic and Health Survey (DHS) showing low complete immunization coverage in Ghana among kids aged 12–23 months (GSS, 2017).

It has been ascertained that even as inadequate rates of immunization against childhood diseases stay a major public health problem in the world's resource-poor regions, it is because immunization services are poorly understood (Akmatov & Mikolajczyk, 2012; Jani *et al.*, 2008). Apart from this, the problem could also be attributed to the socio-demographic/economic factors of mothers, health facility/system factors, and socio-cultural factors that impede the successful implementation of immunization coverage in such poor

resource countries (Gram *et al.*, 2014). Given credence to this assertion, studies have authentically demonstrated that Ghana has significant health inequities across urban / rural, socio-economic and educational divisions (MoH, 2011).

In spite of these concerns, surveys to validate administrative coverage and identify predictors of immunization status are not given the desired attention in peripheral countries like Ghana (Mitchell, 2009; Adokiya *et al.*, 2017). To address this deficiency, the Bottleneck analysis (BNA) process was used to assess gaps in immunization services in Ghana so as to sustain the gains in immunization coverage (Yawson *et al.*, 2017). Following on from this effort, this study sought to examine factors influencing coverage of immunization among children aged 12–23 months at Teshie and Nungua communities in the Ledzokuku-Krowor Municipality of the Greater Accra Region of Ghana.

1.1. Problem Statement

It is suggested that vaccination could reduce child mortality significantly and it is a cost effective way to improve child health; however, the worldwide statistics show that more than 22 million children do not receive the basic recommended vaccinations (Wado *et al.*, 2014). For instance, the World Health Organization (WHO, 2018) indicates that child mortality is still a major concern to developing countries, including Ghana. The report revealed that about 39 children per every 1000 live births died in 2017 alone. This is equivalent to 1 in every 26 children dying before reaching age 5 in 2017. Specifically, about 5.4 million children below age 5 died in 2017, with half of the number registered in sub-Saharan Africa (WHO, 2018; UNICEF, 2018).

In Ghana, the administrative coverage of the Expanded Programme on Immunization (EPI) is usually high, whereas childhood immunization status remains low (Adokiya, Baguune &

Ndago, 2017). In this regard, majority of children do not receive all the recommended seven (7) vaccines in 15 doses before one year of age (Adokiya *et al.*, 2017).

Vaccine refusal by parents who are domiciled in Africa has also contributed to the low immunization coverage for children in the region (Fredrickson *et al.*, 2004). Fredrickson *et al.* (2004) explain that factors, including antenatal care follow ups, health facility birth, and knowledge of when a child is to start and end immunization, among others, were reported to have been neglected by parents. Fredrickson *et al.* (2004) further revealed that this refusal was usually conditioned on fear of side effect of the vaccine (52%), religious doctrines (28%), belief that the disease was not harmful (26%), unreliable service provider, and anti-government sentiments (8%).

Institutional deficits have also been identified to have accounted for the low turnouts for immunization in Africa (Gram *et al.*, 2014). Gram *et al.* (2014) report that shortages of vaccines during immunization programmes have greatly deterred parents from attending immunization programmes. Moreover, in addition to the remoteness of healthcare facilities from parents who are resident in remote villages, the poor attitude of healthcare professionals towards attendees of immunization programmes and their general unreliability have adversely influenced the readiness of parents to seek for immunization services (Gram *et al.*, 2014; Fredrickson *et al.*, 2004). Yawson *et al.* (2017) reported that in Ghana, only 50% of regions and districts had health facilities with at least 80% of health care workers provide in-service training on routine immunization; only 40% of districts had communities with functional fixed or outreach EPI service delivery point and over 70% of regions and districts had challenges with effective coverage of infants aged 0-11 months fully immunized during the past year.

1.2. Justification of the study

Although a lot of progress has been made through immunization, common childhood diseases such as Measles, Diarrhea, Pneumonia, Poliomyelitis, Tuberculosis, Tetanus, Yellow Fever, Whooping Cough, etc., continue to kill several child in Ghana (Forder, 2002; Adokiya *et al.*, 2017). In the light of the above, an effort towards achieving healthier childhood has become more critical to all stakeholders and health partners (Forder, 2002; Adokiya *et al.*, 2017). Thus, an evaluation of the immunization program operations is essential in the realization of the extent to which the study population uses survival intervention. This research examined the factors affecting childhood immunization coverage within the ages of 12 – 23 months, so as to establish possible reasons that could account for low coverage by caregivers. Among the factors assumed to have influenced coverage of immunisation include the following discussed.

The impact of socio-demographic variables had to be identified on immunization coverage. That is, the mothers' own socio-demographic characteristics could influence their decision to send their children for immunisation as evidenced in previous studies (Schoeps *et al.*, 2013). Schoeps *et al.* (2013) highlighted education, poverty, seasonality, and area as factors that were associated with timely vaccination in Burkina Faso. However, this study sought to address this crucial issue so as to fill the gap in literature.

It could be argued that the health facility factors hold a critical key to encouraging mothers and caregivers to attend immunisation programmes. For instance, the attitude of healthcare nurses delivering immunisation and waiting time at the facility could either motivate or demotivate these mothers when they are supposed to immunise their children as documented (Abdulraheem, Onajole, Jimoh, & Oladipo, 2011). Abdulraheem *et al.* (2011) observed that parents' objection, disagreement or concern about immunization safety, long distance

walking and long waiting time at the health facility were the most common reasons for partial immunization in Nigerian.

In the case of Ghana, other key health system bottlenecks included, limited number of fixed and outreach sites, difficult to reach island communities along the Volta Basin, inadequate storage facilities for vaccines at lower levels, stock out of vaccines and auto destruct syringes and absence of updated policies/field guides at services delivery points/facilities (Yawson *et al.*, 2017). Nevertheless, the researcher could not identify any study that had examined these health facility factors with respect to how they encourage or discourage mothers and caregivers from immunizing their children in the Ledzokuku Krowor Municipality. Hence, the study was necessary to unearth some of the reasons that could be attributed to health facility factors in order to contribute to extant literature on the topic accordingly.

In the context of sub-Saharan African countries in general and Ghana in particular, sociocultural factors are considered important when discussing issues related to access to healthcare in general and immunization coverage in particular as reported (Ahorlu, Koram, Ahorlu, De Savigny, & Weiss, 2006). Ahorlu *et al.* (2006) studied socio-cultural determinants of timely appropriate treatment seeking for children under 5 years suspected of having a perceived malaria-related illness in Ghana. These researchers suggest that effects on health seeking of illness-related experience and meaning are complex, and explaining their role may strengthen interventions for childhood malaria. Nonetheless, it could not immediately be established how any study had taken this up in studying factors influencing coverage of immunisation in the Ledzokuku Krowor Municipality. Therefore, this study sought to examine how socio-cultural factors could influence coverage of immunisation. This has the potential of contributing to literature.

The accomplishment of the above was likely to reveal significant outcomes that would be useful in many ways. For example, the outcome of this research would help academicians and other activists in the field of public health to intensify awareness campaigns and educational programmes on the importance of vaccinations to improve immunization coverage in the country. Furthermore, the results of the research would be used as confirmatory proof to connect prior reports on EPI by the District Health Management Team (DHMT) and/or to define distinctions and propose corrective measures accordingly. Thus, providing a solid knowledge base for public health professionals to ensure effectiveness in their quest to eradicate preventable sicknesses and deaths among vulnerable groups, especially those pertinent to women and children.

The research would educate DHMT, policymakers, financing organizations and other stakeholders about leadership instruments to use to boost the use of EPI services and decrease default rates, boost coverage levels of immunization and reduce the incidence of vaccine preventable diseases in the Teshie and Nungua communities in the Ledzokuku-Krowor Municipality of the Greater Accra Region of Ghana. The research would finally set the platform for future studies to be conducted to improve EPI service utilization in Ghana.

The impetus for the conduct of the study emanated from the fact that the investigator is a health worker in the country. The knowledge and experience gained from practice contributed to the discussion of the topic and the way forward in addressing limited immunisation coverage in the municipality in particular and the country in general.

1.3. Objectives of the Study

The aims of this research were classified under two headings like general objective and specific objectives.

1.3.1. General Objective

The general objective of the study was to ascertain factors influencing coverage of immunization in the Ledzokuku-Krowor Municipality of the Greater Accra Region of Ghana.

1.3.2. Specific Objectives

Specifically, the objectives were:

1. To examine the association between socio-demographic factors and immunization coverage in the Ledzokuku-Krowor Municipality.
2. To determine the association between health facility factors and immunization coverage in the Ledzokuku-Krowor Municipality.
3. To examine the association between sociocultural factors and immunization coverage in the Ledzokuku-Krowor Municipality.

1.4. Research Questions

The following research questions guided the process of finding answers to address the specific objectives of the study: Address the study's particular goals:

1. What is the association between socio-demographic factors and immunization coverage in the Ledzokuku-Krowor Municipality?
2. What is the association between health facility factors and immunization coverage in the Ledzokuku-Krowor Municipality?

3. What is the association between sociocultural factors and immunization coverage in the Ledzokuku-Krowor Municipality?

1.5. Organization of the Study

The presentation of the report of the study is organized under six chapters. Chapter one covers the background to the research, the problem statement, justification of the research, research objectives and questions. Chapter two expounds on the chosen theoretical framework, and synthesizes relevant scholarly literature on the phenomenon. Chapter three explains the research methodology. Chapter four presents the results of the study. Chapter five is where the key findings of the study have been related to existing literature and similarities and differences explained. Chapter six is where the summary of the study, conclusions, contribution to knowledge, recommendations, limitations to the study and future research have been presented.

CHAPTER TWO

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

2.0. Introduction

This chapter presents the literature of related studies on the concepts underlying the current study. That is, the chapter introduces the theoretical framework and assessment of the subject matter of academic literature. For the convenience of analysis, there are sections relating to the themes underlying the study. The sections include the definition of immunization, coverage of immunization, factors influencing coverage of immunization (which is the main focus of the study), the theoretical framework and the conceptual framework. The chapter ends with a summary, which brings the general ideas of the chapter together and project to the reader what to expect in the next chapter. These topics are essential because they will help to conduct a meaningful analysis and discussions on the results of the study.

2.1. Immunization

Strategies available for assessing immunisation coverage in Ghana seem to be limited (Yawson *et al.*, 2017). Hence, the Bottleneck Analysis (BNA) tool and approach, which provides data driven planning of health service in Ghana was applied to develop regional and national operational plans for immunization and to be the baseline for evaluating the national programme in three years (Yawson *et al.*, 2017).

The World Health Organization (WHO, 2016) defines immunization as the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine. This is because vaccines stimulate the body's own immune system to protect the person against subsequent infection or disease. The idea is that immunization is a proven

tool for controlling and eliminating life-threatening infectious diseases and, it is one of the most cost-effective health investments, with proven strategies that make it accessible to even the most hard-to-reach and vulnerable populations. It has clearly defined target groups; it can be delivered effectively through outreach activities; and vaccination does not require any major lifestyle change (WHO, 2016).

The World Health Organisation explains that immune system helps the body to fight germs by producing substances to combat them (WHO, 2016). Once this happens, the immune system takes note of the germ and can fight it again during subsequent infections because vaccines contain germs that have been killed or weakened. When given to a healthy person, the vaccine triggers the immune system to respond and thus build immunity (WHO, 2016).

Forder (2002) indicates that immunization prevents an individual from contracting diseases like measles, mumps, rubella, hepatitis B, polio, tetanus, diphtheria, and pertussis (whooping cough). The contention of this analyst is that even though the shot given during immunization may serve as a disincentive, the fact that they prevent all these diseases make them worthwhile and highly necessary for infants as well as adults. This is why the Expanded Programme of Immunization (EPI) was launched in 1974 as a global programme for controlling and reducing death from Vaccine Preventable Diseases (VPDs) (Forder, 2002).

Forder (2002), explains that if immunization is stopped, diseases that are almost unknown could stage a comeback and before long lead to epidemics of diseases that are hardly under control; more children would get sick and more would die eventually. Over the years, immunizations have thwarted epidemics of once common infectious diseases such as measles, mumps, and whooping cough (Andrew, 2007). Andrew (2007) notes that because of immunizations, there has been the near eradication of others, such as polio and smallpox.

Hence, aside the immediate benefits that are derived from immunization, it also protects the future of individuals when they get immunized (CDC, 2009). The Centre for Disease Control (2009) suggest that parents do not immunize their children just to protect them, but also protect their grandchildren and other relatives from infections and death. One key benefit of immunisation is that children do not have to get diseases like small pox anymore because it has been eradicated. Consequently, they do not need to be immunized against small pox anymore because the disease no longer exist (CDC, 2009).

The Centre for Disease Control emphasized that before vaccines were used for immunization, people became immune only by actually getting a disease and surviving it. Immunizations therefore, provide an easier and less risky way to become immune to diseases. Since the goal of public health is to prevent disease, it is much easier and more cost-effective to prevent a disease than to treat it (CDC, 2009). That's exactly what immunizations aim to do because it protects the individual from serious diseases and also prevent the spread of those diseases to others (CDC, 2009).

2.1.1. Immunization Coverage

There are formulas to be applied in order to know the number of children who are covered by an immunization exercise (see CDC, 2009). Immunization coverage determines the proportion of children who are vaccinated against a particular antigen compared with the number of children expected to be vaccinated (Tim, Braa & Bjune, 2006). In other words, Tim *et al.* (2006) note that immunization coverage is a key measure of the health system performance and output and it is measured at national, regional, district and sub-district levels.

The calculation is done by a system where the administrative coverage data are collected by monitoring the numbers of doses of the antigen administered to the target population divided

by the total estimated number of target population – this gives the estimate of the percentage coverage (Martinez *et al.*, 2014). This indicates the status of the vaccinations performed by service providers. Other ways to estimate it is where surveys are conducted periodically by reviewing children's vaccination histories to identify coverage levels (Ngure, 2015).

Ngure (2015) observes that surveys are frequently used in conjunction with administrative data; and immunization coverage surveys are also recommended by WHO to be used periodically to verify administrative coverage data. However, there are limitations. For instance, it is argued that immunization coverage rates based on administrative data are mainly subject to numerator (children vaccinated) and denominator (target population) biases (Burton *et al.*, 2009). Burton *et al.* (2009) show that this could lead to an overestimation and underestimation when children vaccinated outside the target age group are erroneously included in the numerator or when vaccinations are not reported by lower administrative levels such as private sector.

Notwithstanding the above, immunization is a cost-effective public health intervention to reduce morbidity and mortality associated with infectious diseases (Adedire, Ajayi & Ajumobi, 2014). Adedire *et al.* (2014) indicate that improving immunization coverage is vital to preventing vaccine preventable diseases and promote good health worldwide. In spite of the global promotion as a major public health intervention, improvement in the coverage of some countries' immunization programme remains low (Bonsu *et al.*, 1997). This is why the World Health Organization (WHO) and UNICEF usually collect and analyse data from all member nations conducting immunization activities (Burton, *et al.*, 2009; UNICEF, 2018; WHO, 2018).

Key amongst these indicators is the Bacille Calmette-Guerin (BCG) and Diphtheria-tetanus-pertussis vaccines, which are used to determine childhood immunization coverage (Burton

et al., 2009). These immunization coverage levels and trends help in monitoring the performance of immunization services locally, nationally, and internationally. Additionally, the findings from the study are used to guide strategies for the eradication, elimination and control of vaccine preventable diseases; and to identify areas of the immunization system that may require additional resources and/or attention for improvement (Burton *et al.*, 2009; WHO, 2018; UNICEF, 2018).

Burton *et al.* (2009) recall that it was not until the 1980s that immunization gained prominence and encountered a remarkable change in its coverage. These researchers continue that before then, the global coverage of the programme had been extremely low. However, by the 1990s, DPT coverage had increased from 20% as in the 1980s to 75%. These analyst asserted that while it was true that some countries reported significant declines in the coverage after the 1990s, the global coverage was fairly maintained. Thus, by the 2000s, there was a steady increase in coverage of DPT 3, reaching as high as 81% in 2006 worldwide (Burton *et al.*, 2009). By the year 2000, countries reaching and sustaining 90% coverage of children with routine life-saving vaccinations had doubled (Adedayo & Mbbs, 2009).

The success of immunisation coverage continues as the updated records on the world's immunization status in 2014 revealed that 129 countries had immunized at least 90% of all children with the 3 doses of DTP vaccine (WHO/UNICEF, 2015). To sustain the gains, in 2012, 194 WHO Member countries endorsed the Global Vaccine Action Plan (GVAP), and are committed to ensuring that no one misses out on vital immunizations with a target of 90% DTP3 vaccination coverage in all countries by 2015 (Adedayo & Mbbs, 2009; WHO/UNICEF, 2015).

However, there are some few challenges. While there is a focus on improving the survival of children, other non-vaccine preventable diseases like malaria continue to cause major morbidity and mortality amongst children under five years of age particularly in African nations (WHO/UNICEF, 2015). The evidence shows that about 1.2 billion (20%) of the world's population are at high risk of malaria, with 49% of this population living in Africa (Nonvignon *et al.*, 2010).

Since the introduction of the EPI programme in 1974, six traditional antigens were initially introduced by WHO in the routine immunization programme of African countries (Fredrickson *et al.*, 2004). In terms of Africa, it was reported that due to the region's unique regional economic, political and ecological circumstances, immunization programmes have been facing serious challenges compared with other continents (Fredrickson *et al.*, 2004). Fredrickson *et al.* (2004) report for instance that in Nigeria, parents' refusal was based on several reasons, including fear of side effect of vaccine (52%), religious doctrines (28%), belief that the disease was not harmful (26%), unreliable service provider, and anti-government sentiments (8%).

During the implementation of the Universal Childhood immunization (UCI), routine immunization coverage increased from 20% to about 57% in the 1980s (Etana & Deressa, 2012). However, this increase experienced a decline in the 1990s when the UCI support ended (Tarantola, Hacen, Lwanga, & Clements, 2014). Tarantola *et al.* (2014) added that resource mobilization became a challenge for EPI activities in the region. As a result of this, the task of achieving and maintaining targeted coverage, getting community participation, retaining trainers and committed staff and above all stable leadership and governance at all levels was not achieved.

Vaccine refusal in Africa continues to affect the overall immunization coverage, particularly with children's immunization programmes (Etana & Deressa, 2012). Etana and Deressa (2012) indicated that though awareness amongst parents and caretakers on immunization was high, only 36% of children aged 12-13 months were fully vaccinated by 2011, evidenced by vaccination cards in Ethiopia. These researchers enumerated several factors as determinants leading to this including antenatal care follow ups, health facility birth, and knowledge of when a child was to start and end immunization among others. However, parents' residence and mother's socio-demographic characteristics showed no association with the low immunization coverage (Etana & Deressa, 2012).

Although immunization plays a major role in the survival of African children, particularly the under five years, the socio-economic and demographic characteristics of mothers are major contributing factors to under-fives' survival (WHO/UNICEF, 2015). Several studies show that variables such as mother's age, level of education, marital status, place of living, occupation, religion, autonomy, contraceptive use, polygamous union, and socio-economic status play pivotal role in the survival of the under-fives, particularly in the rural settings (Chibwana, Mathanga, Chinkhumba, & Campbell, 2009; Kanmiki *et al.*, 2014). Similarly, older parents (35 years and above) were more likely at risk of under five deaths as opposed to younger parents (20 years of age) for the under-fives (Chibwana *et al.*, 2009; Kanmiki *et al.*, 2014).

Currently, efforts are being made by the Global Community through an alliance called the Global Alliance for Vaccines and Immunisation (GAVI) to strengthen immunisation programme activities in developing African countries (Tarantola *et al.*, 2014). Tarantola *et al.* (2014) explained that coverage data from countries' administrative reports from WHO/UNICEF estimated that with these strategies in place, the routine immunisation performance showed progress during the last ten years in Africa.

The Ghana immunization programme was established in June 1978 with six (6) antigens - BCG, measles, diphtheria-pertussis-tetanus (DPT) and oral polio vaccine for infants and tetanus toxoid (TT) vaccination for pregnant women to protect against maternal and neonatal tetanus (MoH, 2014). The records show that the establishment of the immunization programme was in response to the National Health Policy, which had the aim to reduce morbidity and mortality due to vaccine preventable diseases (VPDs), which then contributed significantly to both infant and child mortality in the country (MoH, 2014).

It has been indicated that in Ghana, immunization performance has become a strategic health performance indicator for the entire health sector and it is monitored at all levels (MoH, 2014). The Expanded Programme on Immunisation (EPI) was also established to reduce child morbidity, mortality and disability associated with vaccine preventable diseases through the provision of high quality immunization services (Ministry of Health, 2014, 2016). Specifically, the programme aimed to achieve 95% coverage for all antigens by 2019; maintain a polio free status, achieve measles/rubella elimination, and sustain MNT elimination (Ministry of Health, 2014, 2016).

Reports from the Ministry of Health (2016) showed that Ghana was recognized as one of the countries to have eliminated maternal and neonatal tetanus in the year 2011. It further indicated that the country entered the elimination phase for measles and rubella in 2015. (Ministry of Health, 2016). Against this historical perspective, it was considered needful to Penta-3 has been used as the baseline to evaluate the improvement in childhood immunization. The national coverage of Penta-3 has risen from 90% in 2014, to 95.4% in 2015. However, (29%) of the 216 districts in Ghana could not attain the 80% coverage target for Penta 3 in 2015. The Greater Accra Region documented the highest number (44,487) of unimmunized children examine factors influencing immunisation coverage based on existing literature as discussed below.

2.2. Factors Influencing Immunization Coverage

Studies have recognised significant issues that delay or escalate the chance of uptake of vaccination (Ibnouf *et al.*, 2007; Fernandez, Awotess, & Ramasha, 2011; Masand & Dixit, 2012; Wiysonge *et al.*, 2012). Some of these comprise mothers socio demographic and media advertising (Pandey & Lee, 2011; Masand *et al.*, 2012), among others as analysed below.

2.2.1. Socio-Demographic Characteristics and Immunisation coverage

An analysis of the socio-demographic characteristics of the mother and or the children would help in construing the reasons behind the low or high immunisation coverage. Research revealed that children who are located at the urban settings are more probable to be completely immunised than in those in the rural settings (Fernandez, Awotess, & Ramasha, 2011; Patra, 2008; Manthal, 2007; Masand & Dixit, 2012; Wiysonge *et al.*, 2012). Other findings of the research also showed that the results have also shown that the probability of getting immunisation for children under two years was determined by religious convictions, because of unlikely vaccination of children born to Muslim mothers compared with children born to Christian mothers (Nath, 2007; Babalola, 2009).

Kalule-Sabiti *et al.* (2014) established that Christian mothers tend to have a Western modernized background compared with Muslims and African traditional religions and therefore, are supposed to be frequent customers of health facilities. Ha *et al.* (2009) found that children in families affiliated with apostolic faith were nearly 6 percentage points less likely to be immunized with BCG and measles and 5 percentage points less likely to be immunised with polio compared with children in families affiliated with other Christian organizations in Zimbabwe.

Other trainings also showed that maternal variables were highly likely to result in child vaccination (Pandey & Lee, 2011; Nath, 2007). Some scientists emphasized that mothers with secondary and higher education were better trained and empowered, so they were more likely to have their kids immunized than their primary or non-educational counterparts. (Pandey & Lee, 2011; Nath, 2007). Other studies indicated that immunization adherence improved with mothers' financial status (Etana & Deressa, 2011; Masand *et al.*, 2012). Masand *et al.* (2012) opined that women with high financial status were more likely to immunize their children than mothers with a low financial standing.

2.2.2. Health facility factors and immunization coverage

A study in Ghana observed that inadequate in-service training in routine immunisation and absence of good quality data were major challenges - demand side bottlenecks included fear of mothers on the safety of multiple vaccines and limited active involvement of communities in immunisation service delivery (Yawson *et al.*, 2017). Therefore, it is expected that an assessment of health facilities factors will help in throwing more light on the reasons behind the low or high immunisation coverage. For example, a study reported that factors that are linked to healthcare system, including accessibility, affordability, knowledge and attitudes about vaccination, and guidance from physicians were also significant determinants of vaccination (Nagata *et al.*, 2013).

The World Health Organization (2014) commented that attendance to immunization programmes are usually influenced by poor knowledge of parents about vaccination, lack of convenient venues and logistics at outreach centres, financial problems, long waiting times, transport problems, inadequate incentives for service providers and weak Intersectoral collaboration, the timing of immunization programmes, attitude of service

providers, fear of side-effects, and religious doctrines – these are the main determinants of immunization coverage (WHO, 2014).

For example, a study reported that availability to healthcare delivery in rural regions was low as likened to the cities and immunisation was considerably higher where nearness to a health service areas was smaller as the case with city areas (Ibnouf *et al.*, 2007; Rup *et al.*, 2008). For instance, it has been reported that children in urban areas have a higher prospect of being fully vaccinated than those resident in rural sectors (Ibnouf *et al.*, 2007; Rup *et al.*, 2008; WHO, 2014). Some analysts reported that this is because accessibility to health services in rural areas is a major problem in comparison with urban sectors - immunization coverage was much higher in communities that had healthcare centres close to them than those that were remote from immunization centres (Ibnouf *et al.*, 2007; Rup *et al.*, 2008).

This problem gets exacerbated when the immunization centre lacks the required doze of vaccines for all the children present for vaccination (Ibnouf *et al.*, 2007; Rup *et al.*, 2008; WHO, 2014). Available evidence shows that parents whose children fail to receive vaccination on account of shortages in the quantity of dosage available run the risk of being absent from subsequent immunization programmes scheduled for the district (Ibnouf *et al.*, 2007; Rup *et al.*, 2008; WHO, 2014).

Another aspect is that compliance immunisation is similarly greater when women are attended to by health care providers when pregnant and give birth at health facilities (Babalola, 2009; Etana & Deressa, 2011; Pandey & Lee, 2011; Masand *et al.*, 2012). However, it is reported that subsequent attendance at immunization programmes to vaccinate children could be influenced by perceptions the mother holds concerning services received from the healthcare centres during pregnancy and delivery (WHO, 2014).

Furthermore, use of health services and access to media publications are likewise considered to be strong determinants of immunization attendance (Ibnouf *et al.*, 2007; Rup *et al.*, 2008; WHO, 2014). Becker *et al.* (1993) reported that radio and a television ownership was significant in determining immunization - ownership of these devices improved the probability of immunization. The idea is that media announcements and advertisements constitute a major source of information to parents on immunization schedules for respective districts. It educates parents on the importance of immunization exercises and the likelihood of preventing diseases that would otherwise have caused the demise or incapacitation of their children (Becker *et al.*, 1993). Duah-Owusu (2004) established that Ghana has improved access to health information by commercial outlet.

2.2.3. Sociocultural factors and immunization coverage

It is believed that socio-cultural factors, including myths, beliefs and friends/neighbours, among others, have an influence on parents' decision to immunise their children. For instance, a study explained that vaccine hesitancy is complex and context specific, varying across time, place and vaccines, which is influenced by factors such as complacency, convenience and confidence (MacDonald, 2015). Confirming this position, a study found that children of non-educated fathers in rural areas of Burkina Faso had higher rates of complete immunization coverage than those in the urban area (Sanou *et al.*, 2009).

To be able to understand the context within which to assess the influence of social factors on immunisation coverage, the Vaccine Hesitancy Determinants Matrix was developed displaying factors influencing the behavioural decision to accept, delay or reject some or all vaccines under three categories: contextual, individual and group, and vaccine/vaccination-specific influences (MacDonald, 2015). Impliedly, Sanou *et al.* (2009) found that good communication about immunization and the importance of availability of immunization

booklets, as well as economic and religious factors appeared to positively affect children's immunization status in Burkina Faso.

It has been reported that there is vaccine hesitancy among adults 65 years and above due to structural social determinants, including social and cultural values, as well as intermediary determinants including housing-place of residence, behavioural beliefs, social influences, previous vaccine experiences, perceived susceptibility, sources of information, and perceived health status (Nagata *et al.*, 2013). Sanou *et al.* (2009) also informed that the success of vaccination among children in Burkina Faso was often hampered by the poor economic conditions of households and insufficient communication and knowledge regarding immunization issues.

2.3. Theoretical Framework

This section presents the theoretical perspective underlying the study. It is formulated to understand the research within a broader context. It also provides a means of setting out an explanation that defines and makes sense of the data used to conduct this study.

2.3.1. Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) was postulated by Ajzen and Fishbein (1980). This is used by scholars to explain and predict variety of health behaviours of patients, and help caregivers and policy makers in their bid to understand reasons why many patients accept (or do not accept) medical care and recommended treatments from primary caregivers (Ajzen & Fishbein, 1980). Ajzen and Fishbein (1980) posit that the theory opines that intention is the most important basis for behaviour.

These intentions are prompted by one's beliefs and attitudes regarding treatment behaviours (for instance, the belief and attitude regarding the effectiveness and side effects of medical prescriptions), past behaviours (history of treatments), anticipated behavioural

control, and self-efficiency (Carter, 1990; Hagger, Chatzisarantis & Biddle, 2002). It states that actions proceed from either the favourable or unfavourable balance between attitudes, subjective norms, belief about control and self-efficacy, and past behaviour (Ajzen & Fishbein, 1980). The theory proposed four factors, including behavioural intention, attitude, subjective norm, and past behaviours as predictors of health seeking behaviours as analysed below (Ajzen & Fishbein, 1980).

According to Ajzen and Fishbein (1980), behavioural intention measures an individual's relative strength of mentality to engage in a particular behaviour. It suggests that an individual's behavioural intention is founded on the person's attitude about the behaviour, past experiences and subjective norms. If a person intends to perform a behaviour, then it is likely that the person has already considered their lived experiences regarding the consequences of the behaviour, has a strong belief in their ability to accomplish the task and is determined to go ahead with it. To put the concepts of the theory into perspective, the theory of reasoned action asserts that the decision of nursing mothers in Ghana to heed to the advice of medical doctors to go for immunizations (behavioural intention) is influenced mainly by their past experiences with the use of the substance, influences from their environments on the effectiveness of the drug, and their determination to be self-dependent.

Attitude on the other hand encompasses beliefs about the repercussions of performing the behaviour as well as the person's valuation of these penalties. Ajzen and Fishbein (1980) also explained the theory of Reasoned Action (TRA) in relation to life expectancy. Individuals rate how intended and alternative actions could reduce their health problems. Women are constantly engaged in rigorous assessment of the expected outcomes of the usage of vaccinations. This also explains the health seeking behaviour of mothers who do not inform their primary caregivers about their use of other medications concurrently with hospital prescription (Ajzen and Fishbein, 1980). Their anticipation of practitioners'

negative reaction to the news, without adequately understanding their predicaments, as well as the possibility of being placed under strict supervision, normally deters them from talking about it.

Subjective norm is seen as a combination of anticipated expectations from relevant individuals or groups and the intentions to abide by these expectations (Ajzen & Fishbein, 1980). The preceding arguments show, as in the words of Ajzen and Fishbein (1980) that attitudes, norm and formal institutions contribute immensely in predicting the tendency that mothers will vaccinate their new born. Subjective norm indicates caregivers' understanding of the social pressures to either perform the behaviour or shun it (Ajzen & Fishbein, 1980; Fishbein & Middlestadt, 1989).

It is determined by the kind of approval or disapproval the individual receives from performing the behaviour, as conditioned by his/her determination to do it, or with regards to societal myths and/or key individuals in the community. These set of beliefs, which shape a person's subjective norm is called normative beliefs. Thus, a person who believes that important referents think that s/he should vaccinate his/her child would regularly do so to comply with the wishes of those referents. When parents' belief in public campaigns on vaccination is strong, and are implored to do so by key focal persons who could also be respectable professionals in the field of health, the likelihood that the parents would comply would be high (Ajzen & Fishbein, 1980).

2.4. Conceptual Framework

Figure 2.1 presents the conceptual framework developed for the study based on literature and the theoretical analysis. It shows how the socio-demographic characteristics, health facility factors and socio-cultural factors link up with each other to encourage mothers and caregivers to utilise immunisation for their children.

The socio-demographic indicators explain the relationship between caregivers' age, place of residence, occupation, among others and immunization coverage in the study area. When mothers find it difficult to transport their children to immunization centres due to the remoteness of their communities from the designated vaccination centres; have inadequate funds to pay for their transportation to-and-from the centre; have some amount of reserve money for food and nutritional needs during their stay at the facility; and/or other payments that may be necessary to make their journey comfortable and successful, they are most likely to be absent from immunization programmes.

In other words, when a mother or caregiver holds the conviction that favourably rating the effects of immunization on the health and wellbeing of her child, the likely financial cost involved to vaccinate the child against her other financial needs, then she is likely to immunize her child regularly. On the other hand, a parent who holds a strong conviction that negatively valuing the importance of vaccination, by way of considering the financial burden involved in taking the child to the healthcare centre, meeting eligibility requirements, and attitudes of service providers towards her when she attend immunization programmes, may develop lackadaisical attitude towards the programme.

Another important factor to consider is the mothers/caregivers knowledge and understanding of the necessity of immunization and EPI services. When mothers rate EPI services to be important, they will always keep all EPI service dates, time and immunization centres in mind, and hence, ensure that they always have their children vaccinated. The mothers/caregiver's age, educational level, and proximity to information regarding immunization play a crucial role in increasing the awareness level of the importance of immunization.

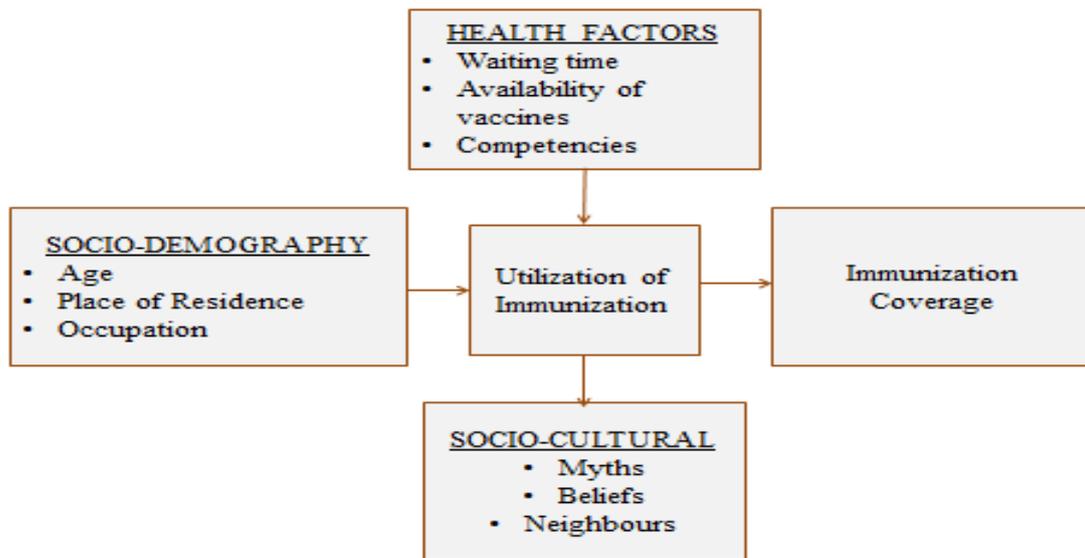


Figure 2.1: Conceptual Framework. Source: Researcher’s Conception (2019).

The healthcare facility factors encompass attitudes of health professions and level of training and knowledge regarding immunization and paediatrics. The figure 2.1 indicates that immunization coverage is greatly influenced by vaccination service delivery systems. For instance, when mothers/caregivers have to wait for long hours to be attended to, whereas they have their businesses and other important tasks on hold, they are likely to stop attending such programmes.

Again, mothers and caregivers who attend immunization programmes are very observant. When mothers / caregivers observe that service providers are poorly motivated or too overloaded with many activities at the same time, making it difficult for them to attend to their needs, they are likely to stop going for healthcare services. Additionally, low staff numbers, inadequate logistics to meet the increasing demands of parents during immunization sessions, and/or shortages in vaccines during immunization programmes are likely to discourage parents from attending the programme. Thus, a parent may have the intention to vaccinate his/her child due to her understanding of the dangers, the real

behaviour may actually be influenced by the fact that on that day there was a free transportation available to commute him/her to-and-from the healthcare centre.

Moreover, others may attend the immunization programme but fail to have their children vaccinated because of the bad attitude of healthcare professionals towards them. Therefore, immunization coverage could be improved if healthcare facilities are improved and healthcare providers given adequate training to ensure effectiveness in rendering the service (see Ajzen, 1985; Ajzen, 1991; Ajzen & Fishbein, 1980; Fishbein & Middlestadt, 1989; Montano & Kaspersky, 2002).

As illustrated in figure 2.1 above, if parents believe that patronage of immunization services would lead to outcomes of good health to their children; and their evaluation of these outcomes based on institutional and social influences would permit them to go for the service, then the likelihood that they would vaccinate their children would be high. In addition, parents' belief that specific individuals or groups, including social norms and customs, religious doctrines, dictates and desires of spouse and other significant family members, support their patronage of vaccination for their children would greatly influence their likelihood to perform the behaviour, and their determination to abide by all rules and regulations concerned with immunization.

In that case, the parents' attitudes toward immunization and the intention to perform the behaviour would always be consistent with instructions from healthcare professionals who administer the vaccine (see Ajzen & Fishbein, 1980). People's likelihood of performing a given behaviour would be strong if they hold a favourable belief towards the performance and outcomes of that behaviour (see Ajzen & Fishbein, 1980). In other words, some researchers demonstrate that attitude towards immunization is influenced by the evaluative implications of the total set of beliefs parents hold in addition to the belief they have

regarding the appropriateness of immunization, and its usefulness (see Ajzen & Fishbein, 1980).

2.5. Chapter Summary

The chapter reviewed scholarly articles on immunization coverage in Africa and Ghana. Specifically, the context of immunization coverage, and determinants of patronage of immunization programmes in Ghana were discussed. These sections were developed in line with the objectives of this research. The chapter also introduced the theoretical framework and the conceptual framework for understanding the research. The Theory of Reasoned Action suggested by Ajzen & Fishbein (1980) was used to give a conceptual direction to the research. Based on this theory, a conceptual framework that focuses on parents' belief about behavioural outcomes, influence from key individuals and social norms, and health facility factors (institutional factors) and personal subjective norms were used to explain the coverage of immunization in the country. The next chapter introduces and explain the research methodology and method of data collection and analysis adopted for the study.

CHAPTER THREE

METHOD

3.0. Introduction

This chapter presents the methods applied to collect data for analysis in the study. It is divided into sections. These include the philosophical assumptions underlying the study, study design, the study area, study population (inclusion criterion, exclusion criterion), sample size, sampling method and selection, study variables, data collection, pre-testing, quality assurance, data handling and analysis, and ethical considerations. The chapter ends with a summary where the main ideas have been provided with an insight into what the reader should expect in the next chapter indicated.

3.1. Philosophical Assumption

The choice of the quantitative research method for the study was based on the researcher's philosophical assumption as a positivist. The paradigm was proposed by Auguste Comte (1798 – 1857) to define a research methodology that is founded on scientific methods for studying phenomena. Comte (1856) pointed out that experimentation, observation and assumptions that are grounded on experience must constitute the foundation on which human behaviour is understood, and hence, constitute the only legitimate means of extending knowledge of human behaviour. It is, to him, the most acceptable means to explore research phenomena and answer research questions.

This paradigm was considered the best approach for this research because it aids the researcher to analyse and interpret observations using facts or quantifiable entities (Fadhel, 2002). The positivist paradigm is usually employed to ascertain cause-and-effect association between variables under observation. It also employs deductive logic, formulates hypotheses, and offers operational definitions and mathematical equations, and expressions,

to arrive at an acceptable conclusion; and offers explanation to provide predictions on the basis of quantifiable and verifiable outcomes. These outcomes, according to Cohen, Manion and Morrison (2000), are deterministic, empirical, parsimonious and capable of being generalized.

3.2. Study Design

The excellence of any research project is enhanced by a strong knowledge of the research design and this research was based on a cross-sectional studies (Creswell, 2007). Creswell (2007) notes that the strategy relates to a set of methods with emphasizes on quantitative analyses where study information are collected using questionnaires, a set of techniques emphasize quantitative analyses, where data for the research are gathered using questionnaires, and the data analysed using statistical techniques. (Creswell, 2007).

The cross-sectional research is a research methodology, which enables the researcher to conduct a one-shot study on the phenomenon under observation in a population at a particular point in time (Bethlehem, 1999). Bethlehem (1999) observes that here, the investigator gathers information from a targeted population segment to gather enough information on the issue from a representative sample in order to make generalisations. Usually, the variables observed in the sample population are selected using the probability basis to make inference about the population as a whole. Consequently, since the researcher adopted the quantitative method, which entails the use of numbers and statistical techniques in analysing data, it gave the researcher room for generalisation and predictions (Blaikie, 2010). Again, the method ensured that the researcher was able to conduct the study objectively, and make assumptions based on the findings arrived at (see Easterby-Smith, Thorpe & Jackson, 2012).

3.3. Study Area

The selected areas for this study were the Teshie and Nungua communities, located in the Ledzokuku-Krowor Municipal Assembly (LEKMA) in the Greater Accra Region of Ghana. The municipality is one of the 254 Metropolitan, Municipal and District Assemblies (MMDAs) in Ghana, and forms part of the 16 MMDAs in the Greater Accra Region (GSS, 2014). LEKMA with its Administrative capital at Nungua was established under the Legislative Instrument (LI 1865) on 1st November, 2007, and inaugurated on 29th February 2008 (GSS, 2014).

Geography

LEKMA's complete land area is estimated at 47, 57510 square kilometres and is bounded by the Guinean Gulf (from the Kpeshie Lagoon to the Sakumono Junction) to the south. It continues to the 'on the run' traffic light along the railway line through Sakumono. The Spintex Road to the Coca Cola Roundabout is bordered to the East. Johnson Wax transforms this to the left and right. To the north of the border is the motorway through the Tetteh Quarshie Interchange and runs south along the limits of the Ashitey Akomfra Electoral Area and towards the Kpeshie Lagoon River (LEKMA, 2017; GSS, 2014).

Demography

The map of LEKMA as shown in Figure 3.1 indicates that the municipality is wedged between the West Metropolitan Assembly of Accra and East Metropolitan Assembly of Tema. According to 2010 population and housing census stood at 227,932 with 109,185 males (48%) and 118,747 females (52%) (GSS, 2014). This provides a sex ratio of 1:1.8 males to females. The dominance of females over males is a reflection of the nationwide trend where the projected ratio is 1:1.03 (GSS, 2014). The total household population in the district is estimated to be 221,757, which comprises 60,859 households who live in the 21,366 houses within the municipality. The average household size in the municipality is

2.8 persons per household and the population per house is estimated at 10.4, indicating that compound houses are the most common type of dwelling (68.5%) within the municipality (GSS, 2014).

The municipality's age structure and gender compositions are comparable to that of the domestic structure. It demonstrates a distinctive youthful population of a developing country like Ghana. The age-sex structure is broad-based, consisting of child concentration at younger ages. The proportion at greater ages gradually decreases at advanced ages in subsequent age groups with a tiny amount of older people and more women than men. However, for the male population, the age range of 15-19 years is greater than the female, and this may be due to maternal mortality (GSS, 2014).

An overwhelming bulk of 92% of the municipality's population belongs to the religion known as Pentecostal / charismatic, while only 7 percent and 3.3 percent belong to Muslims and Traditionalists. The statistics for the 2010 population and housing census disclosed that in the municipality followed by the Ewes, the Gas or Ga people were the dominant ethnic group. Other ethnic groups in the municipality are Akans, Kasenas, Grusis, Nkonyas, Busangas and many other tribes (GSS, 2014).

Economy

Majority of the people living in the municipality are middle income earners while 28% constitute the high income earners leaving 19% of the localities as low income earners. The municipality is fortunate to have a lot of companies, factories, industries, financial institutions, estate developers and other small scale businesses. These institutions contribute a lot to the Assembly's Internally Generated Funds (IGF) as well as provide employment for most of the inhabitants. Fishing and trading are other economic activities within the municipality since it is a coastal area, which shares boundary with the Gulf of Guinea. The

Assembly also relies on the external sources of funds like the District Assembly Common Fund (DACF), District Development Fund (DDF), Urban Development Grants (UDG) and other Government of Ghana (GOG) transfers for its developmental projects.

The Assembly over the years performs relatively well in Rates followed by Business Operating Permit, Fees and Fines and Rent on Assembly property in that order. In spite of the seemingly booming economy, there are a lot of challenges in the municipality such as high levels of unemployment with its associated vices. Access to credit is a key challenge to a lot of Small Scale Enterprises. Even though measures are being put in place nationwide to alleviate poverty, the growing population and rural urban migration is making it a challenge within the municipality (LEKMA, 2017; GSS, 2014).

Healthcare provision

The municipality currently has three main kinds of health services: hospital, health centre and others. These categories are also put under state and private wide headings. There are currently a total of nine (9) health facilities, consisting of four (4) hospitals, one (1) health centre and four (4) other low hierarchy facilities, including clinics (LEKMA, 2017).

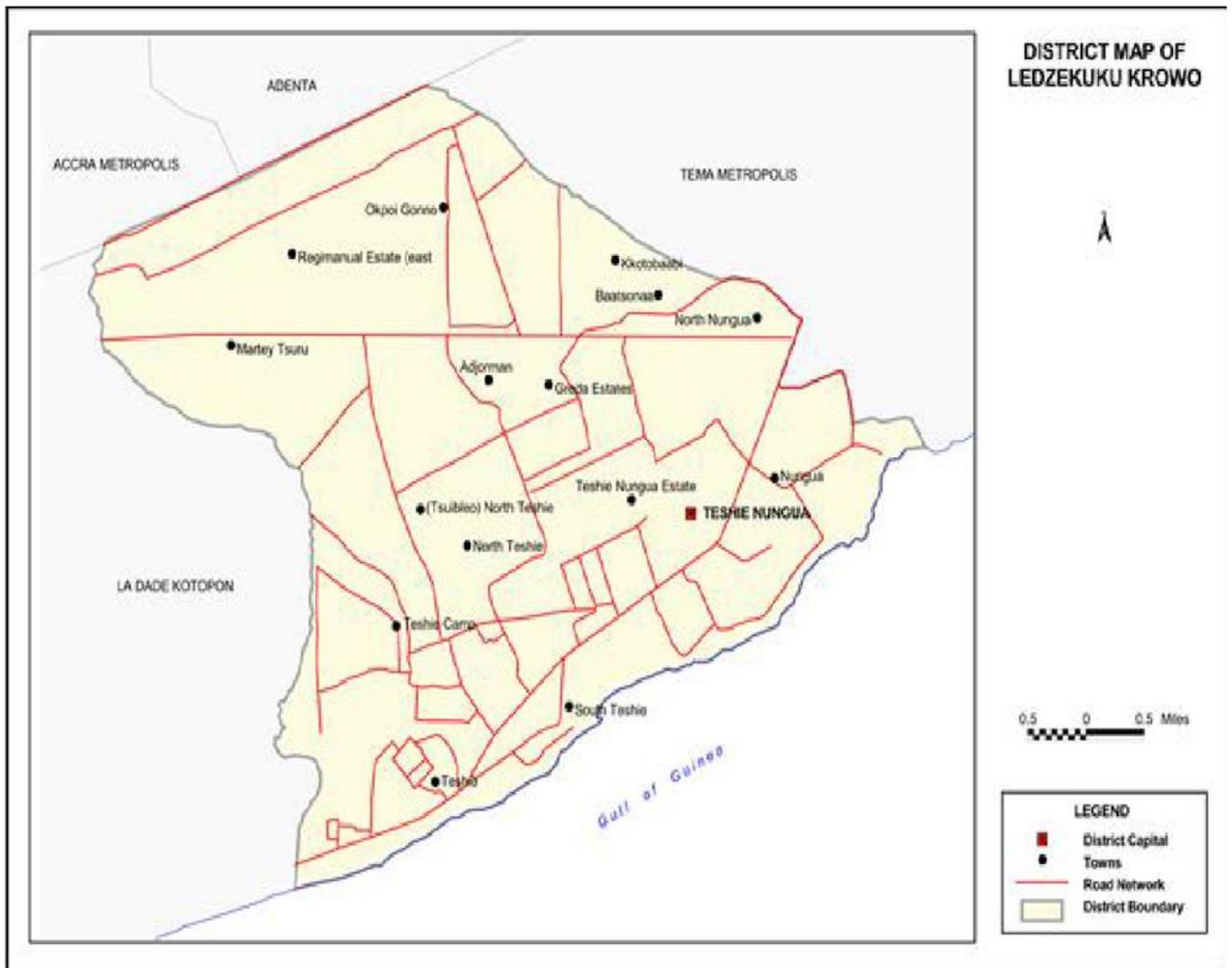


Figure 2.2: Map of LEKMA. Source: Ghana Statistical Service (2014).

3.4. Study Population

This is the total group of individuals from which the sample was drawn (Creswell, 2007). For the purpose of this research, the population was strategically defined to include only mothers or caregivers with children between the ages of 12-23 months who lived in the Teshie and Nungua communities in the Ledzokuku-Krowor Municipality of the Greater Accra Region of Ghana.

3.4.1. Inclusion Criteria

- The inclusion criteria were mothers or caregivers who:
- Had a child between 12-23 months.

- Had a child record booklet or not.
- Had lived in the community for the past one year.
- Had a child of 12-23 months who agreed to be part of the study and filled the consent forms.

3.4.2. Exclusion Criteria

- The exclusion criteria were mothers or caregivers who:
- Had a child less than 12 months or more than twenty three months (older than 23 months).
- Did not reside in the selected area of study
- Declined to participate in the study.

3.5. Sampling Method

Sampling permits the concise and conscious selection of representatives from a group of items, people in a community, or institution for gathering research data for measurements and analysis (Creswell, 2007). Creswell (2007) argues that sampling reduces the cost involved in conducting research, provide accurate information for analysis, and reduce the time required to conduct the study. The multi-stage sampling method was used to recruit respondents for this research. This included a combination of the cluster sampling and simple random sampling techniques.

The multi-stage sampling design allowed the researcher to recruit participants on multiple levels. First, a group was selected and then some or all the units in each group measured. It was the household level that the final interviewing took place to represent the whole population. In this design, the size of each primary unit was defined as the number of population units contained in each primary unit. Hence, the researcher was always certain

that all or the primary units were equal or when they varied, the size of each unit known before any measurement was conducted (Creswell, 2007).

Using this design, the researchers first, divided the study area into 50 clusters representing known neighbourhoods using the map of the Ledzokuku-Krowor Municipality. The simple random sampling method, which is a probability sampling technique that allows a researcher to give all potential respondents equal chance of participating in the research (Creswell, 2007) was then used to randomly select 25 clusters from which respondents were sampled. The researcher recruited 9 respondents from each of the 23 selected clusters and 10 from the remaining 2 clusters to participate in the study. To accomplish this objective, the researcher counted and recruited every other second mother with a child (ren) aged 12 - 23 months, and who was also a resident of the municipality for at least one year to participate in the research. This approach was repeated across all selected neighbourhoods in the municipality until the required number of respondents was sampled for the research (see Shaughnessy, Zechmeister & Zechmeister, 2006).

3.5.1. Sample Size Determination

The sample size refers to the number of independent, random sample units drawn from the research population to participate in the study - it represents that number of replicates or subjects (Creswell, 2007). The study recruited 227 mothers/caregivers to participate in the research. The sample size for the study was calculated using the Cochran's (1975), formula;

$$n = (Z \times Z \times PQ) / (D \times D),$$

Where,

n = desired sample size,

Z = Reliability coefficient for 95% confidence interval usually set at 1.96.

P = proportion of children who have had their Penta3 0.82 (Ledzokuku-Krowor Municipal Health Directorate, 2017).

$$Q = 1 - P$$

$$= (1 - 0.82)$$

D = degree of accuracy desired set at 0.05 probability level.

A coverage of 81.9% (8646/10545) obtained in the year 2017, for Penta3 in the Ledzokuku - Krowor Municipality was used.

Substituting,

$$n = (Z \times Z \times PQ) / (D \times D),$$

$$n = (1.96 \times 1.96 \times (0.82 \times 0.18)) / (0.05 \times 0.05)$$

$$n = 226.81$$

$$n = 227$$

Adjusting for a non-response rate of 10%, at least a total of 250 mothers (caregivers) of children aged 12-23 months were determined for the study as sample size.

3.6. Study Variables

Variables are characteristics, traits or attributes of research units that can be classified or measured (Kerlinger, 1983). Kerlinger (1983) explained that they are logical grouping of attributes or properties that take on different values. The variables of this study were made up of dependent and independent variables as shown below.

3.6.1. Dependent Variable

The dependent variable was immunization coverage (status) for children within the ages of 12 and 23 months. This was measured using a scale that rated the results as partially and fully immunized or the schedule of immunization coverage was used.

3.6.2. Independent Variables

The independent variables comprised the respondents' sociocultural, socio-demographic factors and other factors pertinent to the healthcare centres where vaccination is usually received.

Socio-demographic/economic characteristics of mothers/caregivers: Age, sex, socio-economic (such as occupation, etc.), level of education, religious affiliation, ethnicity, parity, ANC attendance, among others.

Health facility factors: Waiting time, attitude of staff, availability of vaccines, competence, distance to facility, means of transport, among others.

Socio-cultural factors: husband's support, customs and norms, beliefs, among others.

3.7. Data Collection

Data for this study will be collected between the months of May and June, 2019. Data collection is defined as the strategy for gathering and measuring information on research variables, based on an acceptable order to enable the researcher to answer queries, and/or stated research questions, test hypotheses, and evaluate outcomes (Creswell, 2007). Creswell (2007) explains that based on the type of study conducted, the nature of the information gathered, and the strategy used to gather this information varies. Since this research adopted the quantitative approach, data that dealt with quantities, values or numbers, making them measurable were collected using questionnaires designed by the

researcher. Only the primary data was collected in order to address the objectives of the study. The primary data collection involved the design and administration of a structured questionnaire.

To obtain adequate information on the study, the primary data gathered views of individual mothers with children between the ages of 12-23 months residing in the Teshie and Nungua communities of the LEKMA. That is, a structured questionnaire with sections was designed and administered to the mothers/caregivers in the communities. Section A collected data on the socio-demographic characteristics of the mothers/caregivers, including their age, educational background, occupation, religion, ethnicity, among others.

Section B gathered information on health facility factors; including waiting time, attitude of health providers, and availability of vaccines, among others. Section C collected data on socio-cultural factors, including friends' advice, husband's support, customs and norms regarding choice of healthcare service, religious doctrines and advice from key religious leader, among others. Section D collected data on the socio-demographic characteristics of the children, including their age, immunisation status, type of immunisation received, and the child's position in the birth order.

The questionnaire as designed as open and close-ended questions was administered through both interviewer-administered and self-administered approaches based on the educational background of the participants. Using close-ended questions, the respondents were asked to select "Yes" or "No" in response to questions; or where multiple choices were provided, to choose the option that best answered the question. The five-point liker scale measuring a range of responses was also used. Four research assistants helped in the distribution/administration of the questionnaires. Each questionnaire was administered

within 20-30 minutes at locations convenient to the participants in the selected communities (see appendix B).

3.8. Quality Assurance

Reliability is the ability to measure consistently or precision and accuracy of a measuring instrument to yield consistent and stable measurements (Heale & Twycross, 2015) in an empirical research (Noble & Smith, 2015). Thus, the instrument is considered reliable if a measurement procedure consistently estimates relatively the same responses to individuals with equal values each time the test is completed. The reliable instruments could introduce less error within the statistical measurements and resulting analyses (Thanasegaran, 2009). The Cronbach's coefficient alpha (α) was used to test the reliability of this study. The Cronbach's (α) is presented as a score between 0 and 1, where higher figures show higher levels of consistency (Kimberlin & Winterstein, 2008; Heale & Twycross, 2015).

A pre-test was conducted. It involved selecting, and interviewing 10 mothers/caregivers in the same manner that was followed in the main study. This helped the researcher to know whether the responses to the questionnaire were in line with the type of information needed. In addition, the results obtained in the pre-test suggested new ideas that were included in the final tool. The pre-test involved randomly recruited ten mothers/ caregivers as respondents to ensure clarity, ease, and flexibility of the questions being asked. Errors and anomalies detected were also corrected before going to the field.

3.9. Data Management and Analysis

The returned questionnaires were cleaned, edited and coded before analysis. That is, the questionnaires answered by the respondents were coded and interpreted using the STATA Version 15. The data was analysed using the descriptive statistics (i.e. Mean, Standard Deviation, etc.). Frequency distribution tables and charts were also presented. Bivariate and

multivariable comparisons were made between immunisation status and independent variables using chi square, Fisher's exact and logistic regression respectively. Chi square and Fishers exact was used to determine the association between immunization status and each of the independent variables. This multiple regression analysis was done to determine which of the variables were strongly associated with child's immunization status. The level of significance was accepted at $p < 0.05$ at 95% confidence interval.

3.10. Ethical Considerations

Steps were taken to ensure that ethical issues underlying the study were complied with as explained below.

Ethical approval

Ethical approval for the study granted by the Ghana Health Service Ethics Review Committee of the Research and Development Division in Accra. The reference number: GHS-ERC069/02/19.

Permission from the study site

A letter of introduction and request for permission for the study was sent from the School of Public Health to the Greater Accra Regional Health Directorate; and LEKMA Municipal Health Directorate. This permission was sought before the commencement of data collection at the facility while a focal person was contacted in each selected community to assist the researcher to identify subjects and collect data for analysis.

Confidentiality and anonymity

Respondents were also accorded due confidentiality and anonymity. Names of respondents were replaced with codes for easy identification. This ensured that the true identities of the respondents involved were protected.

Voluntary withdrawal

Participation in the study was absolutely voluntary to the respondents. The respondents were informed about their freedom to withdraw at any time during the conduct of the study.

Participants' consent

Verbal and written consent was obtained from each study participant before information was gathered (see appendix A for the consent form).

Data storage and usage

Data gathered using questionnaires were locked up with key in a locker that is accessible only to the researcher. Information entered into the researcher's personal computer was also protected using a password that only the researcher knew. These would be destroyed and or discarded after five years.

Compensation

Since the study was purely an academic work, the researcher did not planned to give any financial compensation to respondents for participating in the study. This was thoroughly explained to all potential participants before they were permitted to complete the questionnaire. However, the focal persons who assisted the research assistants during data collection were compensated for their time and service rendered.

Conflict of interest

On grounds of the fact that this research, being a community based study, required the assistance of a focal person in the community to conduct the research, it was expected that households of interest to the focal persons might pose a peculiar problem of identity exposure that might influence the information respondents provided. In the event where

this happened, the researcher together with the lead supervisor determined, based on the degree of impact this had on the research, to replace the focal person for the neighbourhood, or exclude households that might be compromised by the presence of the focal person.

As part of the expectations from this research, the researcher was expected to answer professional questions on healthcare provision and immunization services, thereby assuming dual roles throughout the conduct of the study. This might have created conflicts and undue influence, and/or power balance between the respondents and the researcher. Against this backdrop, the researcher discussed with the lead supervisor on the kind of questions that the researcher was permitted under the circumstance to answer, and those to be referred to experts by providing the respondents with phone numbers and addresses of experts in the field.

Risks and Benefits

The objectives did not pose any imminent risk of physical pain to people who participated in this research. However, it was anticipated that some of the respondents might experience psychological discomforts when responding to questions that hinged on past unresolved negative experiences with healthcare providers, or their child's health. This notwithstanding, respondents' participation in this research expected to inure some benefits to them. For instance, in addition to the education the study provides with regards to the importance of immunization to their children, the respondents were given the opportunity to seek for clarifications on pertinent health issues that they were hitherto oblivious to.

Results dissemination

Since this project was an academic work, the results of the study would be made available to the School of Public Health, University of Ghana for archiving and publication. As part of the ethical requirements for conducting this research, the report would be made available

to the Ghana Health Service Ethics Review Committee and the LEKMA Municipal Health Directorate when a request was made. The researcher would publish part or the complete findings of this research in journals and or engage in academic presentations.

Protocol amendments

Substantial amendments might be made after original approvals from the Ghana Health Service Ethics Review Committee, and the School of Public Health approvals have been granted. If the amendment required immediate implementation due to safety concerns, this would be discussed with the School of Public Health, the GHS Ethical Committee and the lead supervisor and a formal amendment submitted as soon as possible. Some of the major issues that might fall under this amendment include changes to the design/methodology of the study, changes to the procedures undertaken by the researcher/respondents, safety and physical integrity of respondents/researcher, changes to the definition at the end of the research, among others.

Other minor changes that may occur during the conduct of this research, but only with the approval of the lead supervisor included updating contact points, changes to funding arrangements, changes in documentation used to record study sites, inclusion of new study sites, changes to contact details in the community, or the extension of the study period beyond the period specified in the initial proposal.

3.11. Chapter summary

This chapter has enumerated the various methods that were applied to conduct the study within the communities in the LEKMA. The philosophical position of the researcher as a positivist, which encouraged the application of quantitative methods has been declared. Moreover, the ethical considerations involved in the study since it involved human subjects, have also been explained. The next chapter presents the results of the analysis.

CHAPTER FOUR

RESULTS

4.0. Introduction

This chapter presents the results obtained from analysis of the data collected through administration of questionnaires. There are eight sections therein. Section one presents the descriptive statistics of the socio-demographic characteristics of the respondents. Section two presents the Fisher's exact test results of the association between socio-demographic characteristics and immunisation. Section three presents the Fisher's exact test results of the association between health facility factors and immunisation. Section four presents the Kruskal-Wallis tests results of the association between socio-cultural factors and immunisation. Section five presents the Fisher's exact test results of the association between socio-demographic characteristics of the child and immunisation. Section six presents the logistic regression test results of the factors influencing immunisation. Section seven presents results of the immunization taken by child on the scheduled date or other date. Section eight presents the chapter summary.

4.1. Socio-demographic characteristics of mother of children

Generally, it should be observed that for the purposes of this analysis, the age range used for the children was between 18 and 23 months. This was because these children were supposed to have completed their immunisation according to the recommendations. A total of 227 mothers responded to the questionnaires.

The results of the socio-demographic characteristics of mothers of children showed that while 156 (68.7%) were married, 16 (7.1%) were divorced. Whereas 117 (51.5%) were in the age range 25-34 years, the least number, 16 (7.1%) were in the age range 45 years and above. The religious background showed that 165 (72.7%) described themselves as

Christians and 62 (27.3%) described themselves as Muslim/Traditionalist. On their ethnic affiliation, 88 (38.8%) were said to be Akans while the least number, 35 (15.4%) described themselves as Ewes.

Relating to the mothers' level of education, 82 (36.1%) had completed secondary and the least number, 18 (7.9%) had no formal education. Similarly, the fathers' level of education indicated that 106 (46.7%) had attained tertiary whereas the least number, 2 (0.9%) noted that they had no formal education. With regards to the mothers' monthly income, whilst the highest number, 52 (22.9%) showed that they earned in the range of GHS200-399, the least number, 23 (10.1%) earned in the range of GHS800-999. This monthly income of the mothers reflected in their main occupation as 75 (33.0%) were traders/others and the least number, 40 (17.6%) were said to be working in the public sector. Most of the mothers, 189 (83.3%) noted that they resided in urban areas whereas the rest, 38 (16.7%) resided in rural areas of the metropolis. The results are detailed in table 4.1.

Table 4.1: Socio-demographic characteristics of mother of children

Variable	Total N (%)
Marital status	
Single	31 (13.7)
Married	156 (68.7)
Cohabiting	24 (10.6)
Divorced	16 (7.1)
Mother's age (years)	
15-24	30 (13.2)
25-34	117 (51.5)
35-44	64 (28.2)
45+	16 (7.1)
Religion (mother)	
Christian	165 (72.7)
Muslim/Traditionalist	62 (27.3)
Ethnicity (mother)	
Ewe	35 (15.4)
Akan	88 (38.8)
Ga	57 (25.1)
Others	47 (20.7)
Level of education (mother)	
None	18 (7.9)
Primary	58 (25.6)
Secondary	82 (36.1)
Tertiary	69 (30.4)
Level of education (father)	
None	2 (0.9)
Primary	35 (15.4)
Secondary	84 (37.0)
Tertiary	106 (46.7)
Monthly income (mother)	
<200	36 (15.9)
200-399	52 (22.9)
400-599	29 (12.8)
600-799	40 (17.6)
800-999	23 (10.1)
1,000+	47 (20.7)
Main occupation (mother)	
Public sector	40 (17.6)
Private sector	67 (29.5)
Unemployed	45 (19.8)
Traders/Others	75 (33.0)
Residence	
Rural	38 (16.7)
Urban	189 (83.3)
Total	227 (100.0)

4.2. Fisher's exact test: Association between socio-demographic characteristics and immunisation

The results of the cross-tabulations with Chi-square and Fisher's exact tests showing the association between socio-demographic characteristics of mothers of the children and immunisation have been demonstrated. The results showed that out of the 31 single mothers, 22 (71.0%) had full immunisation compared with 131 (84.0%) of the 156 married women, 19 (79.2%) of the 24 cohabiting women and 13 (81.3%) of the 16 divorced women with full immunisation. However, the differences in the levels of immunisation were not significant due to the p-value of 0.353. Similarly, the results showed that out of the total of 117 (51.5%) in the age range 25-34 years, 102 (87.2%) had fully immunised their children. Nevertheless, the differences were not statistically significant as the p-value was 0.113. On the issue of mothers' religion, out of the 165 (72.7%) who were Christians, 137 (83.0%) had immunised their children fully. Nonetheless, the differences were not statistically significant since the p-value was 0.332.

For ethnicity, it was observed that out of the 88 (38.8%) who claimed to be Akans, 65 (73.9%) had fully immunised their children. Contrarily, the differences were not significant because the p-value was 0.133. For the level of education of the father, the results indicated that out of the 106 (46.7%) who had attained tertiary education, 92 (86.8%) were assumed to have been related to the children who had full immunisation. On the contrary, the differences were not statistically significant due to the p-value of 0.119. On the basis of the mothers' residence, out of 189 (83.3%) who resided in urban areas, 154 (81.5%) had full immunisation for their children.

However, for the level of education of the mother, out of the 82 (36.1%) who attained secondary education, 70 (85.4%) had full immunisation of their wards. Subsequently, the differences were statistically significant with p-value of 0.001. Moreover, for monthly

income of the mothers, it showed that out of 52 (22.9%) who earned in the range of GHS200-399, it was 40 (76.9%) who had full immunisation of their children. Consequently, the differences were statistically significant as the p -value was 0.001. In addition, with regards to the main occupation of the mothers, it was revealed that out 75 (33.0%) who were traders/others, 60 (80.0%) had full immunisation of their children. As a result, the differences were statistically significant because the p -value was 0.001.

Therefore, it could be seen from the table that, it was only the level of education ($p < 0.001$), monthly income ($p < 0.001$) and main occupation ($p < 0.001$) of the mother that had significant differences as seen from their p -values. It should be informed that p -values less than 0.05 indicate significant differences in immunisation levels across the variables concerned. The p -values are in-line horizontally with their respective variables. Additionally, it should be explained that where Chi-square tests were not appropriate due to expected cell counts being very low (< 5), Fisher's exact tests were used, which were more appropriate. See the table footnote for tests which used Fisher's exact test. The results are outlined in table 4.2.

Table 4.2: Fisher's exact test: Association between socio-demographic characteristics and immunisation

Variable	Total N (%)	N (%) with immunisation		P-value
		Partial	Full	
Marital status				0.353 ^a
Single	31 (13.7)	9 (29.0)	22 (71.0)	
Married	156 (68.7)	25 (16.0)	131 (84.0)	
Cohabiting	24 (10.6)	5 (20.8)	19 (79.2)	
Divorced	16 (7.1)	3 (18.8)	13 (81.3)	
Mother's age (years)				0.113 ^a
15-24	30 (13.2)	8 (26.7)	22 (73.3)	
25-34	117 (51.5)	15 (12.8)	102 (87.2)	
35-44	64 (28.2)	15 (23.4)	49 (76.6)	
45+	16 (7.1)	4 (25.0)	12 (75.0)	
Religion (mother)				0.332
Christian	165 (72.7)	28 (17.0)	137 (83.0)	
Muslim/Traditionalist	62 (27.3)	14 (22.6)	48 (77.4)	
Ethnicity (mother)				0.133
Ewe	35 (15.4)	5 (14.3)	30 (85.7)	
Akan	88 (38.8)	23 (26.1)	65 (73.9)	
Ga	57 (25.1)	8 (14.0)	49 (86.0)	
Others	47 (20.7)	6 (12.8)	41 (87.2)	
Level of education (mother)				<0.001 ^a
None	18 (7.9)	7 (38.9)	11 (61.1)	
Primary	58 (25.6)	18 (31.0)	40 (69.0)	
Secondary	82 (36.1)	12 (14.6)	70 (85.4)	
Tertiary	69 (30.4)	5 (7.3)	64 (92.8)	
Level of education (father)				0.119 ^a
None	2 (0.9)	1 (50.0)	1 (50.0)	
Primary	35 (15.4)	9 (25.7)	26 (74.3)	
Secondary	84 (37.0)	18 (21.4)	66 (78.6)	
Tertiary	106 (46.7)	14 (13.2)	92 (86.8)	
Monthly income (mother)				<0.001 ^a
<200	36 (15.9)	20 (55.6)	16 (44.4)	
200-399	52 (22.9)	12 (23.1)	40 (76.9)	
400-599	29 (12.8)	2 (6.9)	27 (93.1)	
600-799	40 (17.6)	3 (7.5)	37 (92.5)	
800-999	23 (10.1)	3 (13.0)	20 (87.0)	
1,000+	47 (20.7)	2 (4.3)	45 (95.7)	
Main occupation (mother)				<0.001
Public sector	40 (17.6)	1 (2.5)	39 (97.5)	
Private sector	67 (29.5)	7 (10.5)	60 (89.6)	
Unemployed	45 (19.8)	19 (42.2)	26 (57.8)	
Traders/Others	75 (33.0)	15 (20.0)	60 (80.0)	
Residence				0.989
Rural	38 (16.7)	7 (18.4)	31 (81.6)	
Urban	189 (83.3)	35 (18.5)	154 (81.5)	
Total	227 (100.0)	42 (18.5)	185 (81.5)	

a. Fisher's exact test p-values, all other p-values are from Chi-square test.

4.3. Fisher's exact test: Association between health facility factors and immunisation

The results of the cross-tabulations with Chi-square and Fisher's exact tests showing the association between health facility factors and immunisation have been presented. The results revealed that only few variables had statistically significant association with immunisation. For instance, for seeking medical help from traditional sources, out of 148 (65.2%) who 'sometimes' immunised their children, 127 (85.8%) did it in full with the differences been significant as the p-value was 0.022. In relation to service provider normally preferred when sick, out of the 190 (83.7%) who preferred Orthodox (Hospital) service provider, 161 (84.7%) did full immunisation. The differences were significant as the p-value was 0.007. The results are shown in table 4.3a.

Table 4.3a: Fisher's exact test: Association between health facility factors and immunisation

Variable	Total N (%)	N (%) with immunisation		P-value
		Partial	Full	
Services needed at immunization programmes				0.569 ^a
Not able to receive	22 (9.7)	5 (22.7)	17 (77.3)	
Able to receive	205 (90.3)	37 (18.1)	168 (82.0)	
Responsiveness of healthcare providers at immunization programmes				0.954 ^a
Unprofessional	24 (10.6)	4 (16.7)	20 (83.3)	
Not sure	25 (11.0)	5 (20.0)	20 (80.0)	
Professional	178 (78.4)	33 (18.5)	145 (81.5)	
Waiting time to have child vaccinated				0.774 ^a
<30 mins	141 (62.1)	24 (17.0)	117 (83.0)	
30-60 mins	66 (29.1)	14 (21.2)	52 (78.8)	
>1 hour	20 (8.8)	4 (20.0)	16 (80.0)	
Visits to hospital (orthodox facilities) when sick				0.601
Not frequent	160 (70.5)	31 (19.4)	129 (80.6)	
Frequent	67 (29.5)	11 (16.4)	56 (83.6)	
Seeking medical help from traditional sources				0.022
Not at all	79 (34.8)	21 (26.6)	58 (73.4)	
Sometimes	148 (65.2)	21 (14.2)	127 (85.8)	
Service provider normally preferred when sick				0.007
Orthodox (Hospital)	190 (83.7)	29 (15.3)	161 (84.7)	
Traditional (Herbalist)	35 (15.4)	12 (34.3)	23 (65.7)	
Child record booklet(card) recommended for routine immunisation				0.283
Has a card	186 (81.9)	32 (17.2)	154 (82.8)	
Do not have card	41 (18.1)	10 (24.4)	31 (75.6)	
Distance to health facility				0.180
Not a big problem	177 (78.0)	36 (20.3)	141 (79.7)	
Big problem	50 (22.0)	6 (12.0)	44 (88.0)	
Distance to health facility walking/driving				0.318
Up to 30 mins	176 (77.5)	35 (19.9)	141 (80.1)	
1 hour or more	51 (22.5)	7 (13.7)	44 (86.3)	
Means of transport to health facility				0.224
Private (own)	33 (14.5)	3 (9.1)	30 (90.9)	
Taxi	44 (19.4)	11 (25.0)	33 (75.0)	
Trotro/Bus	39 (17.2)	5 (12.8)	34 (87.2)	
Walking	111 (48.9)	23 (20.7)	88 (79.3)	
Total	227 (100.0)	42 (18.5)	185 (81.5)	

a. Fisher's exact test p-values, all other p-values are from Chi-square test

With respect to main reason for noncompliance with immunization schedule, out of the 67 (29.5%) who attributed it to long waiting time, 59 (88.1%) did full immunisation. The differences were significant as the p-value was 0.012. It should be recalled that where Chi-square tests were not appropriate due to expected cell counts being very low (<5), Fisher's exact tests were used, which were more appropriate. See the table footnote for tests which used Fisher's exact test. The results are shown in table 4.3b.

Table 4.3b: Fisher's exact test: Association between health facility factors and immunisation

	Total N (%)	N (%) with immunisation		P-value
		Partial	Full	
Place of delivery				1.000 ^a
Health facility	213 (93.8)	40 (18.8)	173 (81.2)	
Home	14 (6.2)	2 (14.3)	12 (85.7)	
Highest skilled health personnel during delivery				0.788 ^a
None	3 (1.3)	1 (33.3)	2 (66.7)	
Nurse/Midwife	136 (59.9)	26 (19.1)	110 (80.9)	
Traditional Birth Attendant	33 (14.5)	5 (15.2)	28 (84.9)	
Doctor	55 (24.2)	10 (18.2)	45 (81.8)	
Antenatal care visits				0.838 ^a
None	11 (4.9)	1 (9.1)	10 (90.9)	
<4	34 (15.0)	6 (17.7)	28 (82.4)	
4+	182 (80.2)	35 (19.2)	147 (80.8)	
Main reason for noncompliance with immunization schedule				0.012 ^a
Concern about vaccine safety	44 (19.4)	3 (6.8)	41 (93.2)	
Long distance walking	34 (15.0)	9 (26.5)	25 (73.5)	
Long waiting time	67 (29.5)	8 (11.9)	59 (88.1)	
Lack of money	24 (10.6)	8 (33.3)	16 (66.7)	
Social engagements	35 (15.4)	7 (20.0)	28 (80.0)	
Fear of side effects	21 (9.3)	7 (33.3)	14 (66.7)	
Shortage in vaccines on a scheduled visit for immunization				0.462 ^a
Every time	4 (1.8)	1 (25.0)	3 (75.0)	
Not too frequently	102 (44.9)	16 (15.7)	86 (84.3)	
Not sure	24 (10.6)	3 (12.5)	21 (87.5)	
Rarely	97 (42.7)	22 (22.7)	75 (77.3)	
Total	227 (100.0)	42 (18.5)	185 (81.5)	

a. Fisher's exact test p-values, all other p-values are from Chi-square test

4.4. Kruskal-Wallis tests: Association between socio-cultural factors and immunisation

From the Likert scale items, the means and standard deviations (SD) were computed. The values below show that most of the respondents were indifferent (neutral) since they were close to 3, which indicated indifference on the Likert scale 1-5. Kruskal-Wallis tests were used to test if there were significant differences in the distributions of the responses between those who had partial immunisation and those with full immunisation. However, the results showed that there were no significant differences as seen from the p-values. This is also evident from the means and standard deviations, which were quite similar for the two groups. T-tests or other parametric tests were not appropriate in this case. The results are indicated in table 4.4.

Table 4.4: Kruskal-Wallis tests: Association between socio-cultural factors and immunisation (1=Absolutely agree, 2=Agree, 3=Neutral, 4=Disagree, 5=Absolutely disagree)

Variable	Mean (SD)			P-value
	Overall	Partial	Full	
Spouse discourages me from vaccinating child	3.0 (1.7)	3.2 (1.7)	2.9 (1.7)	0.243
Religion discourages hospital attendance/immunization services	2.9 (1.7)	3.1 (1.7)	2.9 (1.7)	0.352
Culture encourages conventional healthcare service than orthodox medication	2.9 (1.7)	2.9 (1.7)	2.9 (1.7)	0.777
Traditional beliefs influence decision to immunise child	3.3 (1.0)	3.4 (1.0)	3.3 (1.0)	0.440

P-values from Kruskal-Wallis tests. SD=Standard Deviation.

4.5. Fisher's exact test: Association between socio-demographic characteristics of the child and immunisation

The Fisher's exact test was used to establish the association between socio-demographic characteristics of the child and immunisation. It should be noted that for the purposes of this analysis, the age range used was between 18 and 23 months. This was because these children were supposed to have completed their full immunisation according to the recommendations.

The results showed that out of 129 (56.8%) children who males, 129 were (56.8%) had full immunisation. Yet, the differences were not statistically significant as the p-value was 0.964. In addition, out of 180 (79.3%) who were in the age range 18-19 months, 146 (81.1%) received full immunisation. On the other hand, the differences were not significant as the p-value was 1.000. For Birth order of child, it was revealed that out of 120 (52.9%) who were in 2-3 positions, 98 (81.7%) had had full immunisation. Contrarily, the differences were not statistically significant because the p-value was 0.740. The results are shown in table 4.5.

Table 4.5: Fisher's exact test: Association between socio-demographic characteristics of the child and immunisation (18-23 month)

Variable	Total N (%)	N (%) with immunisation		P-value
		Partial	Full	
Sex of child				0.964
Male	129 (56.8)	24 (18.6)	105 (81.4)	
Female	98 (43.2)	18 (18.4)	80 (81.6)	
Age of child (months)				1.000 ^a
18-19	180 (79.3)	34 (18.9)	146 (81.1)	
20-21	36 (15.9)	6 (16.7)	30 (83.3)	
22-23	11 (4.9)	2 (18.2)	9 (81.8)	
Birth order of child				0.740
1	72 (31.7)	12 (16.7)	60 (83.3)	
2-3	120 (52.9)	22 (18.3)	98 (81.7)	
4+	35 (15.4)	8 (22.9)	27 (77.1)	
Total	227 (100.0)	42 (18.5)	185 (81.5)	

a. Fisher's exact test p-values, all other p-values are from Chi-square test

4.6. Logistic regression: Factors influencing immunisation

Factors that were significant with immunisation from the Chi-square and Fisher's exact tests were used in logistic regression models to investigate the strength and direction of their association. They were first run individually to give the unadjusted odds ratios, which were all significant after which they were run together in a multi-variable model to investigate their joint effects, controlling for each other.

The results indicated that the odds of having full immunisation was increasing significantly with increasing levels of the mother's educational level. This is shown with those with primary education having a relative odds of full immunisation 1.4 times than that of those without education (the reference group). Those with secondary education had a relative odds 3.7 times while those with tertiary education had a relative odds 8 times than that of those without education. However, after adjusting for the other variables in the tables, the mother's education was no longer significant ($p=0.629$) as those with higher education had a reduced odds of having full immunisation for their children compared with those without education. After the adjustment, those with primary, secondary and tertiary education had a reduced odds of 49%, 7% and 3% respectively as seen in table 4.6.

Table 4.6: Logistic regression: Factors influencing immunisation (Outcome (Immunisation, showing the relative odds of full immunisation))

Variable	Unadjusted		Adjusted	
	OR (95% CI)	P-value	OR (95% CI)	P-value
Level of education (mother)		<0.001		0.629
None	Ref		Ref	
Primary	1.41 (0.47, 4.24)		0.51 (0.12, 2.15)	
Secondary	3.71 (1.20, 11.47)		0.93 (0.22, 3.98)	
Tertiary	8.15 (2.19, 30.31)		0.97 (0.16, 5.75)	
Monthly income (mother)		<0.001		0.004
<200	Ref		Ref	
200-399	4.17 (1.66, 10.47)		5.54 (1.78, 17.25)	
400-599	16.88 (3.48, 81.90)		20.34 (3.32, 124.44)	
600-799	15.41 (4.01, 59.34)		17.50 (2.60, 117.58)	
800-999	8.33 (2.10, 33.13)		5.18 (1.03, 26.10)	
1,000+	28.13 (5.90, 134.04)		14.60 (2.17, 98.24)	
Main occupation (mother)		<0.001		0.207
Unemployed	Ref		Ref	
Public sector	28.50 (3.59, 226.13)		10.99 (1.07, 113.36)	
Private sector	6.26 (2.34, 16.71)		2.00 (0.52, 7.79)	
Traders/Others	2.92 (1.29, 6.63)		1.78 (0.61, 5.22)	
Seeking medical help from traditional sources		0.025		0.248
Not at all	Ref		Ref	
Sometimes	2.19 (1.11, 4.32)		1.71 (0.69, 4.22)	
Service provider normally preferred when sick		0.012		0.883
Orthodox (Hospital)	Ref		Ref	
Traditional (Herbalist)	0.35 (0.15, 0.77)		0.92 (0.31, 2.74)	
Main reason for noncompliance with immunization schedule		0.015		0.070
Concern about vaccine safety	Ref		Ref	
Long distance walking	0.20 (0.05, 0.82)		0.15 (0.03, 0.83)	
Long waiting time	0.54 (0.14, 2.16)		0.18 (0.03, 0.93)	
Lack of money	0.15 (0.03, 0.62)		0.11 (0.02, 0.64)	
Social engagements	0.29 (0.07, 1.23)		0.12 (0.02, 0.74)	
Fear of side effects	0.15 (0.03, 0.64)		0.06 (0.01, 0.35)	

OR=Odds ratio. CI=Confidence Interval

4.7. Types of immunization by children on the scheduled date or other date

The chart below shows the percentages of children who had the types of vaccines taken on time. The results showed the following: BCG (95.1%), OPV0 (92.1%), OPV1 (95.2%), OPV2 (93.4%), OPV3 (93.8%), IPV (92.3%), Penta 1 (95.6%), Penta 2 (94.3%), Penta 3 (92.5%), Pneumococcal 1 (96.0%), Pneumococcal 2 (94.3%), Pneumococcal 3 (92.5%),

Rotavirus 1 (95.6%), Rotavirus 2 (94.1%), Measles Rubella 1 (88.1%), Measles Rubella 2 (81.4%), Yellow Fever (85.9%), and Men A (80.4%). The results are outlined in figure 4.1.

The chart below shows the percentages of children who had the types of vaccines taken on time.

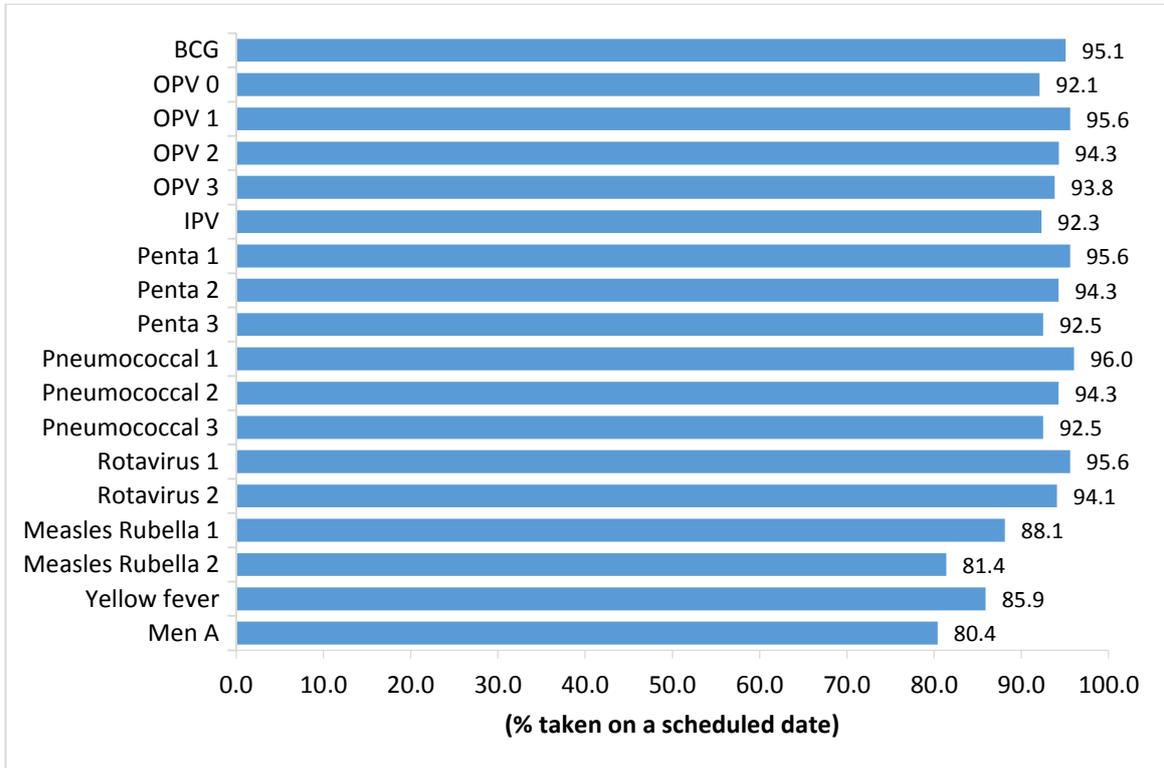


Figure 4.1: Immunization taken by child on the scheduled date or other date

Immunisation status of children 12-23 months at Ledzokuku-Krowor Municipality.

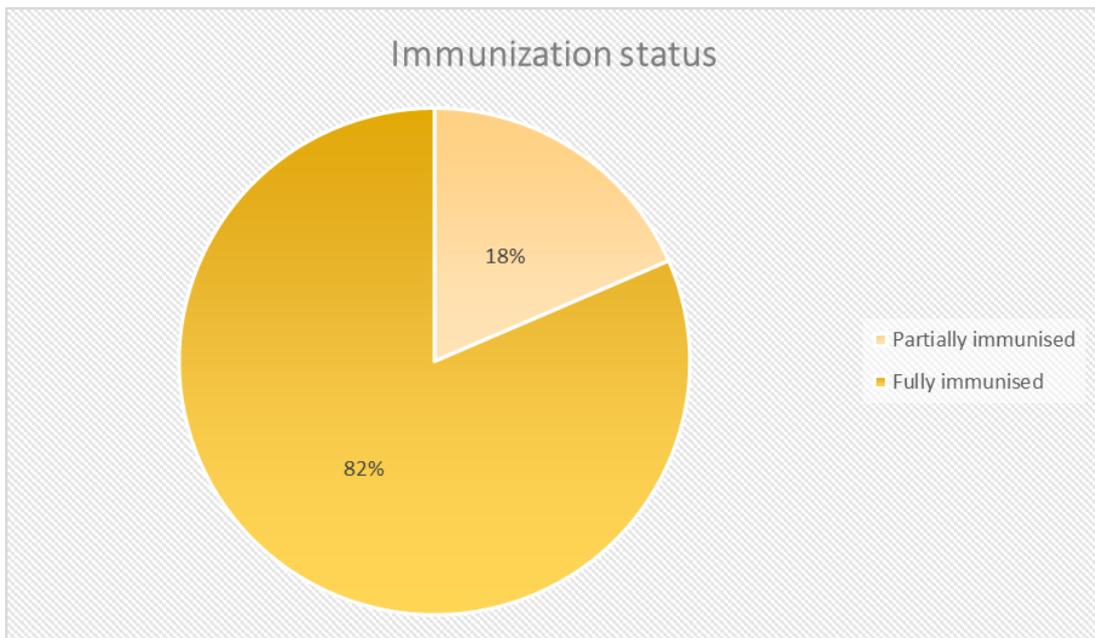


Figure 4.2: Childs immunization status

CHAPTER FIVE

DISCUSSION OF FINDINGS

5.0. Introduction

This chapter presents the results obtained from analysis of the data collected through administration of questionnaires. There are eight sections therein. Section one presents the descriptive statistics of the socio-demographic characteristics of the respondents. Section two presents the Fisher's exact test results of the association between socio-demographic characteristics and immunisation. Section three presents the Fisher's exact test outcomes of the association between health facility factors and immunisation. Section four presents the Kruskal-Wallis tests results of the association between socio-cultural factors and immunisation. Section five presents the Fisher's exact test results of the association between socio-demographic characteristics of the child and immunisation. Section six presents the logistic regression test results of the factors influencing immunisation. Section seven presents results of the immunization taken by child on the scheduled date or other date. Section eight presents the chapter summary.

5.1. Association between socio-demographic characteristics and immunisation

Studies have documented significant factors that impede or boost the probability of uptake of immunization such as maternal education and age, socio-economic status, religion, use of health facilities and media exposures (Pandey & Lee, 2011; Masand *et al.*, 2012). Some of these factors were tested in this study to validate their relevance.

In a study on children, it was documented that maternal age, among other factors, was positively correlated with the caries and oral hygiene of the child (Abiola *et al.*, 2009). Nonetheless, this study found that the age of mothers of the children had no statistical

relationship with their children's immunisation. Even as 87.2% of the mothers in the age range 25-34 years, had fully immunised their children, the differences were not statistically significant ($p = 0.113$). However, this finding contradicts earlier findings that mothers' age (>35 years) was significantly associated with full immunisation (Adedire *et al.*, 2016).

The study found that the marital status of mothers of the children had no significant relationship with full immunisation. Thus, 71% single mothers had full immunisation compared with 84.0% of the married women, 79.2% of cohabiting women and 81.3% of divorced women with full immunisation. The basis was that the differences in the levels of immunisation were not significant ($p = 0.353$). This finding is dissimilar to one which found that participants who were presently married and had at least a post-secondary education were more prepared to receive SMS reminders for childhood immunisation among women attending a tertiary facility in Lagos, Nigeria (Balogun *et al.*, 2012). The differences could be explained by the fact that the current study was not a tertiary hospital compared with the study conducted in Nigeria.

The study observed that mothers' religion was not associated with full immunisation of their children. Although 83.0% of mothers who were Christians had immunised their children fully, the differences were not statistically significant ($p = 0.332$). This finding deviates from earlier findings that the probability of getting vaccination for children aged 12-23 months was considerably determined by religious convictions, as children born to Muslim mothers were unlikely to be vaccinated compared with children born to Christian mothers (Nath, 2007; Babalola, 2009).

For ethnicity, it was observed that out of the 88 (38.8%) who claimed to be Akans, 65 (73.9%) had fully immunised their children. Contrarily, the differences were not significant because the p-value was 0.133.

Previous studies argued that secondary and higher education parents were more probable than their primary or no educated counterparts to have their children vaccinated (Pandey & Lee, 2011; Nath, 2007). The findings of this study were mixed. While 86.8% of fathers who had attained tertiary education had their children fully immunised, but the differences not statistically significant ($p = 0.119$), about 85.4% of mother who attained secondary education had full immunisation of their wards had differences, which were statistically significant ($p = 0.001$). Since the study focused mostly on the mothers, the analysis was based on the mothers' results. This means that the findings agree with a study, which found that mothers' education associated with knowledge of the National HPV immunisation programme in a Teaching Hospital, Kuala Lumpur, Malaysia (Ezat *et al.*, 2013)

The study found that 81.5% of the mothers' residence who resided in urban areas had full immunisation for their children but the differences were not statistically significant ($p = 0.989$). This finding supports an earlier study, which found that children from urban areas, communities with high illiteracy rates, and countries with high fertility rates were more likely to be unimmunised (see Wiysonge *et al.*, 2012). However, this contrasts with the evidence that children in urban areas are more likely to be fully vaccinated than children in rural areas (see Wiysonge *et al.*, 2012).

The findings indicated that mothers/caregivers income and occupation were associated with immunisation. Whilst 76.9% of mothers who earned a monthly income in the range of GHS200-399 had full immunisation ($p = 0.001$), 80% of mothers' whose main occupation was trading/others had full immunisation ($p = 0.001$). This confirms that finding that

mothers with high economic status were more likely to immunize their children than mothers with a poor economic standing (Masand *et al.*, 2012).

Generally, the level of education ($p < 0.001$), monthly income ($p < 0.001$) and main occupation ($p < 0.001$) of the mothers were significantly associated with full immunisation. These could also be attributed to the fact that where Chi-square tests were not appropriate due to expected cell counts being very low (< 5), Fisher's exact tests were used, which were more appropriate.

5.2. Association between health facility factors and immunisation

It would be recalled that the immunisation in Ghana aims to achieve 95% coverage for all antigens by 2019; maintain a polio free status, achieve measles/rubella elimination, and sustain MNT elimination (Ministry of Health, 2014, 2016). Therefore, the realisation of these goals depends on how mothers ensure that their children are fully immunised. Against this perspective, the study observed that seeking medical help from traditional sources had a statistically significant association with full immunisation. That is, 85.8% of mothers who 'sometimes' immunised their children ($p = 0.022$). Thus, there is a suggestion that health facilities and encouragement of women to give birth in these facilities could improve timely vaccination with BCG (Schoeps *et al.*, 2013).

Studies argue that immunization compliance is higher when mothers previously utilized antenatal care services during pregnancy as well as delivered in health facilities (see Pandey & Lee, 2011; Masand *et al.*, 2012). The study found that 84.7% of the mothers preferred Orthodox (Hospital) service provider and this significantly associated with full immunisation ($p = 0.007$). Since some of the communities are described as rural in nature, it would be appropriate to consider the suggestion that health services should support the

community based interventions to reinforce the knowledge and practices of mothers towards the sick children (Haroun, Mahfouz, El Mukhtar, & Salah, 2010).

A study suggests that continuous training, transport means, adequate supervision and motivation of community health workers (CHWs) through the introduction of financial incentives and remuneration should be considered towards improving the work of CHWs in rural communities (Perez, Ba, Dastagire, & Altmann, 2009). This suggestion could be relevant since this study found that 88.1% of mothers attributed the main reason for noncompliance with immunization schedule to long waiting time, which associated with full immunisation ($p = 0.012$). This could be explained by the challenges facing healthcare providers as they lack basic amenities for delivering quality healthcare. This is similar to the revelation that poor performance of basic household health practices could be related to irregular supply of drugs and the need of appropriate follow-up by CHWs (Perez *et al.*, 2009).

5.3 Association between socio-cultural factors and immunisation

Literature revealed that parental attitudes about the protective benefits of immunising and perceived behavioural control were strong, reliable predictors of intention to immunise with MMR (Tickner, Leman, & Woodcock, 2010). However, using standard deviations (SD), the study found that most of the respondents were indifferent (neutral) since they were close to 3, indicated indifference on the Likert scale 1-5. This might be looked at again since the evidence available suggests that attendance at immunization programmes to vaccinate children could be influenced by perceptions the mothers hold concerning services received from the healthcare centres during pregnancy and delivery (WHO, 2014).

The results showed that there were no significant differences between mothers who had partial immunisation and those with full immunisation for their children. This finding could

not be explained by the perspective that vaccine hesitancy among adults 65 years was due to social and cultural values, as well as intermediary determinants, including housing - place of residence, behavioural beliefs, social influences, previous vaccine experiences, perceived susceptibility, sources of information, and perceived health status (Nagata *et al.*, 2013). The difference could be indicative of the fact that the respondents in this study were mostly in their youthful age of 18-34 years.

5.4. Association between socio-demographic characteristics of the child and immunisation

Literature shows that mothers' education, socio-economic status, season of birth, and area of residence are significantly associated with failure of timely adherence to the complete vaccination schedule (Schoeps *et al.*, 2013). The study found no significant association between the gender of children in this study and their full immunisation status ($p = 0.964$). It was only 81.5% of the children who had full immunisation. Although this was lower than 84.9% of children aged 12 - 23 months who were fully immunized in an urban district of Nigeria, the difference could be based on the fact that this study's finding (81.5%) was for children in both rural and urban areas of Ghana while the Nigerian study was for children in only an urban area where the amenities are enhanced (Tagbo *et al.*, 2014).

The study reports that 81.1% of children who were in the age range 18-19 months received full immunisation but was not significant ($p = 1.000$). Thus, it is important to observe that since urban children rely on their mothers' own initiative to get vaccinated, urban mothers should be encouraged more strongly to get their children vaccinated on time (Schoeps *et al.*, 2013). Schoeps *et al.* (2013) found that year of birth, ethnicity, and the number of siblings was significantly related to timely vaccination with Penta3 but not with BCG or measles vaccination. However, this study found that although 81.7% of children who were in 2-3

positions had had full immunisation, the differences were not statistically significant ($p = 0.740$).

5.5. Factors influencing immunisation

Schoeps *et al.* (2013) reported that rural children had an advantage over the urban children in timely vaccination, which was probably attributable to outreach vaccination teams amongst other factors. This study found that the odds of having full immunisation was increasing significantly with increasing levels of the mother's educational level. This is shown with those with primary education having a relative odds of full immunisation 1.4 times than that of those without education (the reference group). Those with secondary education had a relative odds 3.7 times while those with tertiary education had a relative odds 8 times than that of those without education.

However, after adjusting for the other variables in the tables, the mother's education was no longer significant ($p=0.629$) as those with higher education had a reduced odds of having full immunisation for their children compared with those without education. After the adjustment, those with primary, secondary and tertiary education had a reduced odds of 49%, 7% and 3% respectively. This finding is similar to the analysis that overall, children born to mothers with only a primary education were 2.17 times more likely to be fully immunized compared with those whose mothers lacked any formal education in Kenya (Abuya, Onsomu, Kimani, & Moore, 2011).

5.6. Types of immunization by children on the scheduled date or other date

The immunization status of children 12-23 who were fully immunized were 81.5% and 18.5% children were partially immunized at Ledzokuku-krowor municipality. A study found that among parents following the recommended vaccination schedule, 28% thought that delaying vaccine doses was safer than the schedule they used, and 22% disagreed that

the best vaccination schedule to follow was the one recommended by vaccination experts (Dempsey et al., 2011). This study observed that Ghana's recommended 95% vaccines coverage on schedule was achieved in some (BCG: 95.1%, OPV1: 95.2%, Penta 1: 95.6%, and Pneumococcal 1: 96.0% Rotavirus 1: 95.6%,) while others were not achieved (OPV0: 92.1%, OPV2:94.3%, OPV3: 93.8%, IPV: 92.3%, Penta 2: 94.3%, Penta 3: 92.5%, Pneumococcal 2: 94.3%, Pneumococcal 3: 92.5%,Rotavirus 2: 91.2%, Measles Rubella 1: 88.1%, Measles Rubella 2: 81.4%, Yellow Fever: 85.9%, and Men A: 80.4%). Even as this study could not attribute the findings to any particular reasons from the mothers, literature shows that demographic, practice, nurse, doctor and caregiver association explained 68% of the variance in immunisation timeliness between practices (Petousis-Harris et al., 2012).

5.7. Chapter summary

This chapter has presented analysis of the findings and how they conform to or deviate from present literature. Similar to the previous chapter, the findings have shown that some of the socio-demographic characteristics of the mothers of the children statistically associated with full immunisation of their children while others were not. In addition, some of the health facility factors also had a significant association with full immunisation while others were not. It was shown that the socio-demographic characteristics of the children had not significant relationship with full immunisation. Results of the logistic regression also revealed that few of the variables were statistically significant whereas other did not have any significant association. The next chapter presents the summary, conclusions and recommendations.

CHAPTER SIX

SUMMARY. CONCLUSIONS AND RECOMMENDATIONS

6.0. Introduction

This chapter provides a summary of the research; including the major themes discussed, the findings of the research, and lessons learnt. The researcher drew conclusions from the findings and deduced from the findings and discussions in the previous chapters to recommend workable solutions to address the problem of low immunization coverage among children in Ghana. The chapter has been divided into sections. Section one presents the summary of the study. Section two presents conclusions of the study. Section three presents contribution to knowledge. Section four provides the suggestions based on the research results. Section five presents the limitations to the study. Section six presents the directions for future research.

6.1. Summary of the study

This research investigated factors influencing immunization coverage in communities in the Ledzokuku-Krowor Municipality (LEKMA). Using 227 participants, the study generally, concludes that among the factors influencing immunisation coverage was educational level of the mother. That is, the odds of having full immunisation was increasing significantly with increasing levels of the mother's educational level.

6.2. Conclusions of the study

This section presents a summary of the conclusions drawn based on the specific objectives of the study. Specifically, the study identified the influence of socio-demographic factors on immunization coverage; determined the influence of health facility factors on immunization coverage; and examined the influence of socio-cultural factors on

immunization coverage in the Ledzokuku-Krowor Municipality. The conclusions in relation to these objectives have been presented below.

6.2.1. Influence of socio-demographic factors on immunization coverage

Due to intensified awareness campaigns and the establishment of outreach centres across the country, it was discovered that demographic characteristics such as education and employment status played any significant role in determining the hesitance of mothers to immunize their children. However, the high refusal rate among persons who lived in less developed areas coupled with income level played a significant role in determining the child's immunization status. This is why the Ministry of Health demonstrated that Ghana has significant health inequities across urban/rural, socio-economic and educational divisions (MoH, 2011). Thus, there was the need for the Ministry of Health in Ghana to intensify similar programmes in those areas. This will ensure the achievement of full coverage in the entire country.

6.2.2. Influence of health facility factors on immunization coverage

A significant number of children born to respondents who participated in this research were delivered outside the healthcare sector, with the assistance of traditional midwives. This has influenced the mothers' hesitance to immunize their children. Majority of the respondents were not happy with the responsiveness of healthcare professionals when they went for immunization services. Health workers who were not professional in their conduct run the risk of alienating mothers from the healthcare system. A large number of the respondents complained about the long hours they spent at the immunization centres before receiving the service. The study concludes that there were communication gaps between respondents and their healthcare professionals. As such, only few women were aware of the safety and efficacy information of the vaccination offered. This has also been identified to be a major determinant of vaccination coverage in the study area. This explains the reason why similar

studies concluded that the attitude of healthcare nurses delivering immunisation and waiting time at the facility either motivated or demotivated these mothers when they were supposed to immunise their children (Abdulraheem et al., 2011).

6.2.3. Influence of socio-cultural factors on immunization coverage

The study found that coverage of immunisation had increased significantly among all classes of women although a small number of mothers preferred traditional medications to the conventional ones. There still existed the issue of herbal medicine use among mothers. The problem is more alarming when women use the product during pregnancy and give birth under the care of traditional midwives. There is the likely risk of causing health and physical ramifications to themselves and their children. Therefore, the study concludes that existing awareness programmes on the dangers of herbal products is not adequate to dissuade women from using herbal products. It was also discovered that women, although open to discussing medicine-use with their healthcare providers, especially doctors, were nonetheless unable to initiate such conversations with their healthcare professionals. The study concludes that if officials in the public health are more open, and able to chip in such conversations around private practices of their patients, it would pave the way for disclosures on the health-seeking behaviour of patients; an opportunity that could be utilized to better guide the patients to appreciate the usefulness of vaccination. Then again, the study expects the GHS, MoH and Gender, Children and Social Protection to grant broader protection to women and children against cultural persecutions and imposition of traditional values that are dehumanizing and risky for their children's health and health. This will help women who are most vulnerable to influences during the post-natal period, especially in the event that they do not have enough money, and depend on their spouses for support, to have the freedom to choose the type of antenatal and postnatal care they deem appropriate. Through this action, immunization coverage would increase significantly among Ghanaian

children. It is important to consider the argument that effects of socio-cultural determinants on health seeking illness-related experiences and meanings are complicated, and their functions may can reinforce child malaria interventions (Ahorlu *et al.*, 2006).

6.3. Contribution to Knowledge

The research contributes to knowledge in the areas of policy and practice, methodology as have been presented below.

6.3.1. Contribution to policy and practice

It would be recalled that the establishment of the Ghana National Immunisation Programme was in response to the National Health Policy, which had the aim to reducing diseases and death due to vaccine preventable diseases (VPDs) (MoH, 2014). Specifically, the programme aimed to attain a coverage of 95% for all antigens by 2019; sustain a polio free status, attain measles/rubella elimination, and maintain MNT elimination (Ministry of Health, 2014, 2016). To attain the objectives means that some factors have to be identified to assess how they either serve as facilitators or barriers. Thus, this study was conducted in this respect.

Consistent with the findings of this research, which points to awareness creation as one of the most effective determinants of immunization coverage, the study could inform policy makers, especially those in the health sector to design programmes like the house-to-house educational campaign or similar ones, especially for rural dwellers. This will help to reduce households' dependence on traditional medication, while increasing the nation's immunization coverage to full coverage status. The study outcome provides a platform for healthcare providers, particularly public health professionals who work directly with pregnant women and nursing mothers, to help them understand the mechanisms of vaccine hesitancy among women in Ghana. This will create the opportunity for designing

interventions that are specifically tailored to increase households' participation in vaccination exercises.

6.3.2. Contribution to Methodology

The cross-sectional method used in this research facilitated the testing of each variable against immunization coverage to determine their unique effects on the phenomenon in Ghana. Using this approach prevented biases that could have occurred if all variables were lumped together for analysis. As variables are treated differently, the likelihood of influence from high involvement in a specific variable on the general outcome of the research was avoided. This could not have been achieved if qualitative research interviews were adopted.

6.3.3. Contribution to theory

The background and design of the study was built on the basis of some identified theories in the literature (Ajzen & Fishbein, 1980). The fact that parents' decision to immunize their children is bio-psychosocially determined, gives the indication for a comprehensive approach to be taken to understand the full gamut of the phenomenon. The theory of reasoned action provided another dimension of assessing the thought patterns of pregnant and nursing mothers in relation to health seeking behaviours (Ajzen & Fishbein, 1980). It helped to point out the intentions and expectations of women regarding the safety and efficacy, as well as the acceptance of the healthcare procedure in their social milieu to be quite crucial in their readiness to accept such services. Although this study applied a quantitative method, these theories assisted the researcher to identify the key factors needed to quantify the results.

6.4. Recommendations of the study

The study makes some recommendations for consideration by policy makers, healthcare practitioners and mothers.

Women / Mothers of children

In terms of the prevalence of herbal medicine use instead of vaccination, the research recommends for a more comprehensive and nation-wide education and sensitization work on the dangers of herbal medicines to children's health. Specifically, the awareness programme should be focused on de-indoctrinating women about the belief that herbal medications work better than hospital/orthodox prescriptions. In this way, women who are pregnant will listen more to their doctors for advice and directions on the types of medications to take during pregnancy, labour and childbirth, and vaccination during postnatal care.

Healthcare providers

A special training section as customer care could be organized annually for healthcare professionals with the view to helping them understand how patients feel and how to approach their concerns. Doctors and nurses could be trained on how to accept patients irrespective of their origin and socioeconomic status. Most importantly, the behaviour of responsiveness and non-judgemental attitude, which is very crucial for promoting good client-worker relationship, and which facilitates helpful disclosures for better diagnosis of patients' problems for effective treatments, must be cultivated by health workers to encourage mothers to continuously patronise immunization services for their babies.

Health Policy Makers and Stakeholders

Although this research acknowledges the importance of some government policies in promoting access to quality healthcare services, like the free maternal healthcare service, the national health insurance scheme, among others, the findings from the study also identified the need for a wider distribution of these services to meet the needs of all women, irrespective of their location. Otherwise, people in the hinterlands and remote parts of the country who cannot afford the cost of vehicular transportation to immunizations centres,

and/or cannot trek to the centres would not be able to benefit from the programmes. To avoid time wasting during immunization days, several service providers must be trained and assigned to deliver vaccines in a timely manner to enable working mothers to benefit from the programme, and at the time, be able to go back to work.

6.5. Limitations to the Study

Some challenges were encountered in the conduct of this research. It required a lot of effort to convince respondents to agree to participate in the research due to the fear that their privacy would be exposed. Some of the participant were unable to read and comprehend the questions. This gave the researcher the added task of reading and interpreting every question. In addition, the respondents were not located in one area. Hence, the researcher took several days to meet up with each respondent to collect data. Finally, the researcher incurred huge costs in printing out the instruments, personal upkeep, and traveling to meet the respondents.

There might be recall bias as mothers who were not having child record booklet or card might not be able to remember all the vaccine the child has taken. The sample size for the study was relatively low. This may have accounted for the insignificant results obtained in most of the variables measured. The application of only quantitative methods means that the researcher could not explore the respondents' perceptions of the issues raised. All these may restrict the generalisation of the findings of the study beyond the study area.

6.6. Future Research

An explorative study that seeks to draw in-depth explanations from participants on the various variables investigated in this research, using the ethnographic research design, will help to further understand the phenomenon in order to work towards improving it in Ghana,

and Africa as a whole. Additionally, the sample size and other municipalities, metropolitan and districts in Ghana should be increased in future studies to ensure comparison of findings.

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APPENDICES

Appendix 1: Informed Consent

Factors influencing immunization coverage at Ledzokuku-Krowor Municipality – Greater Accra Region

Date __ / __ / 2018

Background

My name is DORCAS DADZIE; I am a student of University of Ghana, conducting a study on Factors influencing immunization coverage at Ledzokuku-Krowor Municipality – Greater Accra Region. The research forms part of my academic work, for the award of Master of Science Degree.

Research Title: Factors influencing immunization coverage at Ledzokuku-Krowor Municipality – Greater Accra Region.

Purpose of the Research

This research is intended to reveal the immunization coverage among children aged 12-23 months, and factors accounting for the trend. The findings will give the government of Ghana and other key stakeholders the insight required to pass new laws and/or amend identified problems in order to reduce infant and child mortality and morbidity rates in the country.

Participation

Your participation in this study is voluntary and as such you have the right to withdraw anytime you feel any discomfort during the data collection process. If you decide to withdraw from the study the data provided by you will be destroyed.

Risks and Benefits

You may feel exposed about revealing sensitive information during the study. Confidentiality is highly guaranteed for you to feel free to talk to the researchers.

The study will be beneficial in that it will inform policy makers strengthen existing policies that promotes the rights of children and the extreme poor in Ghana.

Confidentiality

All personal identifying information about yourself will remain confidential and will not be included in the final write up. Any quotations to be used in reporting the findings will not include names or any identifying data to ensure anonymity. All recordings and transcripts will only be accessible to the researcher.

Compensation

Since the study is purely an academic work, the researcher has not planned to give any financial compensation to respondents for participating in the study.

Funding Information

No cost will be incurred by participant and there will be no remuneration for participant. You are assured that information provided will be used solely for the purpose of the study. This study is solely sponsored by the principal investigator.

Contact

In case of any concern you can contact the Ethics Administrator, Miss Hannah Frimpong, GHS/ERC on: 0243235225 / 0507041223

Appendix 2: Consent form

Participant statement

I..... declare that I have voluntarily agree to answer the survey questions as the survey as well as its purpose, procedures, risk and benefits of this study have thoroughly explain to me in:

English G Twi

I understand I am free to discontinue participation of any time if I so choose. I understand I will be given copies of the participant's information and signed or thumb-printed consent form for any personal records before administration of the questionnaire.

Signature of Participant

Or

Thumbprint (participant)

Date

Investigator Statement

I the undersigned have explained the consent form to the subject in simple language that he / she understands, clarified the purpose of the study, procedures to be followed as well as risks and benefits involved. All questions raised by the participant have been addressed.

Signature of investigator

Date

Appendix 3: Sample Questionnaire

SCHOOL OF PUBLIC HEALTH, COLLEGE OF HEALTH SCIENCE

UNIVERSITY OF GHANA

Questionnaire on Factors Influencing Coverage of Immunisation in the Ledzokuku-Krowor Municipality - Greater Accra Region”

Dear Sir/Madam,

I am a student of the University of Ghana, Legon, carrying out a research on the topic “Factors Influencing Coverage of Immunisation in the Ledzokuku-Krowor Municipality - Greater Accra Region”. I would be grateful if you could provide answers to the following questions. All information provided by you will be treated with utmost confidence/confidentiality. Thank you.

Please indicate with a tick (√) where necessary.

Section A: Mother’s Socio-Demographic Characteristics

A1. Marital status:

- (a) Single [] (b) Married []
 (c) Cohabiting [] (d) Divorced []

A2. Mother’s age:

- (a) 15 – 24 [] (b) 25 – 34 []
 (c) 35 – 44 [] (d) 45+ []

A3. Religion:

- (a) Christian [] (b) Muslim []
 (c) Traditionalist []

A4. Mother’s ethnicity.....

A5. Level of educational

- (a) No education [] (b) Primary []
 (c) Secondary [] (d) Tertiary []

A6. Estimated monthly income..... GHS

- | | | | |
|---------------|-----|-----------|-----|
| Less than 200 | [] | 200 – 399 | [] |
| 400 – 599 | [] | 600 – 799 | [] |
| 800 – 999 | [] | 1000 + | [] |

A7. Main Occupation:

- (a) Public Sector [] (b) Private sector []
 (c) Unemployed [] (d) Others []

A8. Are you the biological parent of the child?

(a) Yes (b) No

A9. Area of residence?

(a) Rural setting

(b) Urban setting

Section B: Health Facility Factors

B1. Are you able to receive the service you need when you attend immunization programmes (Availability of vaccines)?

Not able to receive

Able to receive

B2. How will you appraise the responsiveness of healthcare providers to you when you attend immunization programmes?

Unprofessional

Not Sure

Very Professional

B3. How long did you have to wait to have your child vaccinated?

(a) Less than 30 minutes

(b) 30min – 60 minutes

(c) One hour or more

B4. Do you frequently visit the hospital (other orthodox healthcare facilities) when sick?

(a) Not frequent (b) Frequent

B5. Do you sometimes seek medical help from traditional sources?

(a) Not at all (b) Sometimes

B6. Which service provider would you normally prefer to patronize when sick?

Orthodox (Hospital) (b) Traditional (Herbalist)

B7. Do you have a child record booklet/card for routine immunisation?

(a) Do not have card

(c) Have a card

B8. Distance to health facility:

(a) No big problem Problem Big

B9. How far is the health facility from you?

(a) > 30 minutes' walk/drive (b) 1 hour or more walk/drive

B10. What is your means/means of transport (ation) to the health facility?

- (a) Private (own) []
- (b) Taxi []
- (c) Trotro /Bus []
- (d) Walk (ing) []

B11. Place of delivery:

- (a) Health facility []
- (b) Home []

B12. Attendance at birth

- (a) None []
- (b) Traditional Birth Attendant []
- (c) Nurse/midwife []
- (d) Doctor []

B13. Antenatal care visits:

- (a) No visits []
- (b) Less than 4 []
- (c) 4 and above []

B14. What do you think is your main reason for noncompliance with immunization schedule?

- (a) Concern about vaccine safety Yes []
- (b) Long distance trekking/walking Yes []
- (c) Long waiting time Yes []
- (d) Lack of money Yes []
- (e) Social engagements (Too busy) Yes []
- (f) Fear of side effects Yes []
- (f) Others (please specify)

B16. How often has there ever been shortage in vaccines on a scheduled visit for immunization:

- (a) Every time []
- (b) Not too Frequent []
- (c) Not sure []
- (d) Rarely []

Section C: Socio-Cultural Factors

C1. Father's educational level

- (a) No education []
- (b) Primary []
- (c) Secondary []
- (d) Tertiary []

C2. My spouse discourages me from vaccinating my child.

- Absolutely Agree []
- Agree []
- Neutral []
- Disagree []

Absolutely Disagree []

C3. My religion discourages hospital attendance/immunization services?

Absolutely Agree []

Agree []

Neutral []

Disagree []

Absolutely Disagree []

C4. My culture (one week indoors observance) encourages conventional healthcare service than the orthodox medication.

Absolutely Agree []

Agree []

Neutral []

Disagree []

Absolutely Disagree []

C5. My traditional beliefs (taboos about babies) influence my decision to immunise my child

Absolutely Agree []

Agree []

Neutral []

Disagree []

Absolutely Disagree []

Section D: Child's Demographic Characteristics

D1. Gender of Child:

(a) Male [] (b) Female []

D2. Age of child (in months).....

D3 Birth Order of child:

(a) 1 []

(b) 2 – 3 []

(c) 4 – 5 []

(d) 6+ []

D4 Immunisation status

(a) Not immunised []

(b) Partially immunised []

(c) Fully immunised []

D5. Was the following immunization taken by child on the scheduled date or other date?

Antigen	Response		
	Scheduled Date	Other Date	Non
BCG			
OPV 0			
OPV21			
OPV3 2			
OPV 3			
IPV			
Penta 1			
Penta 2			
Penta 3			
Pneumococcal 1			
Pneumococcal 2			
Pneumococcal 3			
Rotavirus 1			
Rotavirus 2			
Measles Rubella 1			
Measles Rubella 2			
Yellow Fever			
Men A			

MANY THANKS