

**PREDICTORS OF UTILIZATION OF VACCINATION SERVICES AMONG  
CAREGIVERS OF CHILDREN AGED LESS THAN 1 YEAR IN ASEGO  
SUB-COUNTY, HOMABAY COUNTY, KENYA.**

**BY**

**IRIS.W. WANGA, BSN**

**A Thesis Submitted in Partial Fulfillment for the Requirements for the Degree of  
Masters in Public Health (Health Promotion and International Health)**

**SCHOOL OF PUBLIC HEALTH**

**MASENO UNIVERSITY**

**© 2018**

## DECLARATION

### Declaration by the Student

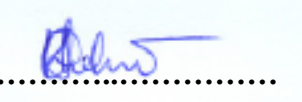
I declare that this thesis is my original work and has not been presented to any other University or Institution for a degree or any other award.


**Iris Wanga**  
**PG/MPH/0013/2012**

**Signature:**.......... **Date:** 6<sup>th</sup> Nov. 2018.....

### Declaration by the Supervisors

This thesis has been submitted for examination with our approval as supervisors:

**Dr. Kiprotich Chelimo (PhD) Signature:**.......... **Date:** 6<sup>th</sup> Nov. 2018.....  
Department of Biomedical Sciences and Technology,  
Maseno University,  
Maseno, Kenya.

**Dr. Timothy Abuya (PhD) Signature:**.......... **Date:** 6<sup>th</sup> Nov. 2018.....  
Senior Analyst,  
Population Council,  
Nairobi.

## **ACKNOWLEDGEMENT**

I would like to express my deepest appreciation and heartfelt gratitude to my supervisors Dr. Chelimo Kiprotich and Dr. Abuya Timothy for their invaluable comments and advices throughout working on this thesis. Their involvement right from idea inception, planning, implementation and correction of the entire thesis has been tremendous and I could never thank them enough for their guidance. I am highly grateful to Mr. Felix Ngira the Public Health Officer, Asego Sub-County and to the Administration of Asego Sub-County for their permission and support, and for providing me with the necessary information to carry out this study. My special thanks go to the community health workers stationed in Asego Sub-County for their support and cooperation during training and data collection.

I also appreciate all the study participants, research assistants, interviewers and transcriptionists for their commitment and full cooperation during data collection.

My gratitude also goes to my parents, Mr. and Mrs. Wanga, for their continuous support and encouragement throughout the journey of attaining this award.

This study was funded by a grant from NACOSTI (National Commission for Science, Technology and Innovation).

## **DEDICATION**

I dedicate this work to my lovely daughter Ruby. May this achievement mirror the great dreams I have for you many years to come- that I will give you the best education you deserve and that you soar to higher heights.

## ABSTRACT

Childhood immunization remains a cost-effective public health intervention geared towards improving health status of infants and children hence reducing both morbidity and mortality associated with vaccine preventable diseases (VPDs). The World Health Organization (WHO) estimates that 17% of the global 1.5 million deaths among children aged under one year are due to VPDs. In 2012 during the transition from Provincial administration to County governments, Nyanza Province had the highest infant mortality rate of 95 per 1000 live births. WHO recommends that immunization coverage among children under one year of age be at least 90% nationally and 80% in every administrative unit yet an estimated 77% of children aged less than one year receive all routine immunizations in Kenya. This proportion varied from 86% in Central to 48% in North Eastern Kenya (the study was not conducted in North Eastern mainly because of external factors such as migration across the Somali border, insecurity and terrorism). In 2012, the former Nyanza Province had an overall immunization coverage of 65% with the lowest coverage of 58.4% in Homabay County. The reason for this low proportion of fully immunized children is not clearly understood. The main objective of this study was to identify the factors contributing to low immunization coverage in Asego Sub-County, Homabay County. Specifically, the study looked at independent variables; sociodemographic and economic, knowledge and perceptions, as well as health provider factors influencing utilization of vaccination services (dependent variable). This descriptive cross sectional survey utilized the WHO, Expanded Programme of Immunization (EPI) cluster sampling method to select a sample size of 210 consenting caregivers from a total population of 3211 children aged below one year residing in Asego Sub-County. Purposive sampling was used to select key informants (KIs) who were administrators of all 10 health facilities in Asego Sub-County. Data collection tools were interviewer administered questionnaires for the caregivers and self-administered semi-structured questionnaires for the KIs. Focus Group Discussions (FGDs) were also conducted at two randomly selected facilities and a thematic analysis of the transcripts generated was done. Chi-square tests were used to investigate associations and a stepwise logistic regression method was used with socio demographic and economic factors. The proportion of Fully Immunized Children (FIC) coverage in Asego Sub-County is 45.3%. Results indicated that the socio-demographic and economic factors affecting utilization of immunization services included caregiver's occupation as a being self-employed, (OR=1.76, p=0.047), earlier birth order (OR=2.47, p=0.0226), child place of birth at home (OR=0.48, p=0.0056), child's age as less than 14 weeks, (OR=13.41, p=0.00) and more than 4 ANC visits (OR=2.18, p=0.044). The knowledge-related factors were such as thoughts that children completed vaccination at 10-59 months (OR=0.20, p=0.008), perceptions that the child is not at risk of disease (OR=0.38, p=0.0165), not knowing return dates (OR=0.19, p=0.008), lateness of health workers (OR=2.22, p=0.022), travel time to facility of between 30 minutes to 1 hour (OR=0.72, p=0.045) and absence of a facility near their homes (OR=0.66, p=0.025). Other factors were such as misconceptions about immunizations, fear of having an HIV test conducted on them, poor communication from the health workers, lack of vaccines at the health facilities and no prior warning about adverse events following immunizations. All associations were reported as odds ratios (OR) with 95% confidence intervals (CI). These findings reveal that there is still low immunization coverage in Homabay County that could partially be attributed to caregivers' socio-demographic and economic factors, perceptions on immunizations as well as the health provider factors. The results of the study could be used by the Sub County Health Management Team of Asego to improve on the bottlenecks negatively affecting service delivery and also educate the community on the benefits of childhood immunizations.

## TABLE OF CONTENTS

TITLE PAGE.....	i
DECLARATION .....	ii
ACKNOWLEDGEMENT .....	iii
DEDICATION.....	iv
ABSTRACT.....	v
TABLE OF CONTENTS.....	vi
LIST OF ACRONYMS AND ABBREVIATIONS.....	ix
OPERATIONAL DEFINITION OF TERMS.....	x
LIST OF TABLES.....	xii
LIST OF FIGURES .....	xiii
LIST OF APPENDICES.....	xiv
<b>CHAPTER ONE: INTRODUCTION.....</b>	<b>1</b>
1.1 Background Information.....	1
1.2. Statement of the Problem.....	3
1.3 Objectives .....	3
1.3.1. Broad Objective .....	3
1.3.2. Specific Objectives .....	3
1.4. Research Questions.....	4
1.5. Significance.....	4
<b>CHAPTER TWO: LITERATURE REVIEW.....</b>	<b>5</b>
2.0: Introduction.....	5
2.1. Socio-demographic and Economic Factors Influencing Utilization of Immunization Services. ....	6
2.2. Knowledge and Perceptions of the Caregivers on Childhood Immunization and Vaccine Preventable Diseases. ....	8
2.3. Health Care Provider Factors Influencing Utilization of Immunization Services .....	9
2.4. Conceptual Framework.....	13
<b>CHAPTER THREE: METHODOLOGY.....</b>	<b>14</b>

3.1. Study Area .....	14
3.2. Study Design .....	16
3.3. Study Population .....	16
3.4. Sample Size Determination.....	16
3.5. Sampling Procedure .....	17
3.6 Eligibility Criteria .....	21
3.6.1 Inclusion Criteria .....	21
3.6.2 Exclusion Criteria .....	21
3.6.3 Human Subject Protection .....	21
3.7. Validity and Reliability of Data collection Instruments .....	22
3.7.1. Validity of instruments.....	22
3.7.2. Reliability of the Instruments.....	22
3. 8. Data Collection Tools .....	23
3. 8.1. Household Interviews .....	23
3.8.2 Focus Group Discussions.....	23
3. 8.3. Self-Administered Questionnaires .....	24
3. 9. Data Management and Analysis .....	24
3. 9.1. Data Management .....	24
3. 9.2 Data Analysis .....	24
3.9.3 Data Storage.....	25
3.10. Ethical Considerations .....	25
3. 10.1. Potential Risks and Benefits of Study to Participants.....	25
3.11. Dissemination .....	25
<b>CHAPTER FOUR: RESULTS .....</b>	<b>26</b>
4.1 Socio Demographic and Economic Factors .....	26
4.1.1. Characteristics of the Caregivers .....	26
4.2. Fully Immunized Child (FIC) Coverage in Asego Sub-County .....	28
4.2.1. Child Characteristics .....	29
4.2.2. Maternal Health Characteristics.....	31
4.3. Knowledge levels of caregivers on immunizations and vaccine preventable diseases.....	33

4.3.1. Knowledge of Vaccines and Vaccine Preventable Diseases.....	33
4.3.3. Perceptions of Caregivers On Immunizations.....	35
4.4. Health Provider Factors .....	38
4.4.1Health provider factors from the Caregivers perspective. ....	38
<b>CHAPTER FIVE: DISCUSSION.....</b>	<b>49</b>
5.1. Socio demographic and economic factors influencing utilization of immunization services by caregivers of children aged less than 1 year in Asego Sub-County, Homabay County. ....	49
5.2 Knowledge and perceptions of the caregivers of children aged less than 1 year on immunization and vaccine preventable diseases in Asego Sub-County, Homabay County.....	52
5.3 Health provider factors that influence utilization of immunization services by caregivers of children aged less than 1 year in Asego Sub-County, Homabay County.....	54
<b>CHAPTER 6: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>57</b>
6.1. Summary of the Findings.....	57
6.2. Conclusion .....	57
6.3 Recommendations from this Study .....	58
6.4 Recommendations for future studies.....	59
<b>REFERENCES.....</b>	<b>60</b>
<b>APPENDICES.....</b>	<b>66</b>



## LIST OF ACRONYMS AND ABBREVIATIONS

<b>AEFI</b>	:	Adverse Events Following Immunizations
<b>ANC</b>	:	Antenatal Care
<b>ART</b>	:	Antiretroviral Therapy
<b>BCG</b>	:	Bacille Calmette Guerin
<b>CHMT</b>	:	County Health Management Team
<b>CWC</b>	:	Child Welfare Clinic
<b>DVI</b>	:	Division of Vaccines and Immunizations
<b>EPI</b>	:	Expanded Programme of Immunization.
<b>FGD</b>	:	Focus Group Discussion
<b>FIC</b>	:	Fully Immunized Child
<b>KDHS</b>	:	Kenya Demographic and Health Survey
<b>KEPI</b>	:	Kenya Expanded Programme of Immunization.
<b>KI</b>	:	Key Informant
<b>MUERC</b>	:	Maseno University Ethics and Review Committee
<b>OPV</b>	:	Oral Polio Vaccine
<b>PHRIO</b>	:	Provincial Health Records and Information Officer
<b>SCHMT</b>	:	Sub County Health Management Team
<b>SGS</b>	:	School of Graduate Studies.
<b>UNICEF</b>	:	United Nations Children’s Education Fund
<b>WHO</b>	:	World Health Organization.

## OPERATIONAL DEFINITION OF TERMS

<b>Child</b>	A young human below the age of full development physically less than 18 years of age
<b>Cluster</b>	A small group that is part of a population that is being surveyed; as seven or more children in the age range of one year.
<b>Cluster survey</b>	A study designed to measure the percentage of individuals in a given age bracket.
<b>Control</b>	Reduction of disease incidence, prevalence, morbidity or mortality to an acceptable level.
<b>Elimination</b>	Reduction to zero of the incidence of a specified disease.
<b>Employed</b>	An individual who works and gets paid
<b>EPI cluster sampling</b>	A survey done in 30 systematically selected clusters of seven or more children to estimate the immunization coverage of all the children that live in the area .
<b>Epidemic</b>	Occurrence of new cases of a disease in excess of what is expected in a human population.
<b>Eradication</b>	Extinction of a micro-organism or pathogen.
<b>Fully Immunized Child</b>	An infant who has received all basic vaccines within first year of life. An infant who has received all age appropriate vaccines as per the KEPI schedule.
<b>Government employee</b>	An individual who works in a state/government entity ;civil servant
<b>Household</b>	A group of persons who live and eat together.
<b>Housewife</b>	A woman whose occupation is running her family's home by working inside the home and managing the household affairs.
<b>Immunization</b>	Process whereby a person is made immune to an infectious disease by the administration of a vaccine/antigen.
<b>Immunization coverage</b>	Proportion of individuals in the target population who are immunized.
<b>Infant</b>	A human offspring in the first year of life.

<b>Infant immunization</b>	The percentage of children under one year of age coverage who have been immunized.
<b>Knowledge</b>	Familiarity and understanding of a concept
<b>Morbidity</b>	Incidence of illness or disease in a population.
<b>Mortality</b>	Incidence of death within a population.
<b>Partially Immunized</b>	An infant who has not received all basic immunizations within their first year of life.  An infant who has not received vaccinations appropriate for their age as per the KEPI schedule.
<b>Private employee</b>	An individual who works in an organization not controlled by the state; citizen sector
<b>Random number</b>	A number selected by chance.
<b>Self employed</b>	An individual who works for oneself and earn income from this work
<b>Susceptibility</b>	State of being predisposed to or at risk of a disease causing organism.
<b>Target population</b>	Group of individuals who are included in the immunization services based on their age and the area in which they live.
<b>Under five</b>	A human offspring below the age of five years.
<b>Vaccination</b>	Process of administering a vaccine to improve immunity to a particular disease

## LIST OF TABLES

<b>Table 2.0:</b> Schedule of recommended immunization in Kenya .....	5
<b>Table 3.1:</b> List of health facilities in Homabay County. ....	15
<b>Table 3.2:</b> List of health facilities in Asego Sub-County. ....	15
<b>Table 3.3:</b> WHO EPI Sampling Procedure for Asego Sub-County .....	18
<b>Table 4. 1.1:</b> Socio - demographic characteristics of the caregivers in Asego Sub-County, Homabay County, December 2014. ....	27
<b>Table 4.2.1.</b> Characteristics of the study children aged between 0 - 12 months in Asego Sub-County, Homabay, December 2014. ....	30
<b>Table 4.2.2:</b> Maternal Health Characteristics among caregivers of children aged 0 - 12 months in Asego Sub-County, Homabay County, December 2014. ....	32
<b>Table 4.3.1:</b> Association between caregivers knowledge on vaccination and immunization utilization in Asego Sub-County, Homabay. ....	34
<b>Table 4.3.3:</b> Perception of caregivers on vaccines and their association with immunization utilization in Asego Sub-County, Homabay ,December 2014.....	36
<b>Table 4.4.1.2:</b> Health provider factors associated with immunization utilization in Asego Sub-County, Homabay County, December 2014 .....	42

## LIST OF FIGURES

<b>Figure 2.4:</b> A framework showing the relationship between the Dependent (utilization of immunization services) and Independent variables (socio-cultural factors, health provider factors and knowledge and perceptions of caregivers.....	13
<b>Figure 3. 1:</b> Map of Asego Sub-county, Homabay county. ....	14
<b>Figure 4.1:</b> FIC coverage in Asego Sub-County, Homabay County. ....	28

## LIST OF APPENDICES

<b>Appendix I:</b> Consent Form.....	66
<b>Appendix II:</b> Questionnaire for Caregivers in English.....	67
<b>Appendix III:</b> Questionnaire for Health Facility Administrators-English.....	73
<b>Appendix IV:</b> FGD Guide for Caregivers -English .....	76
<b>Appendix V:</b> FGD Guide For Caregivers -Dholuo .....	80
<b>Appendix VI:</b> Work Plan .....	84
<b>Appendix VII:</b> Research Budget.....	85
<b>Appendix VII:</b> MUERC Approval Letter .....	86

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background Information

Immunization against communicable diseases in children is implemented through the Expanded Programme of Immunization (EPI). It is one of the cost-effective interventions of public health aimed at reducing morbidity, mortality and preventing disability thus saving millions of lives (UNICEF, 2002). It also plays a major role in achieving the third sustainable development goal of ensuring healthy lives and promoting well-being for all at all ages. This goal aims at ending preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least 12 per 1,000 live births and under-5 mortality to at least 25 per 1,000 live births by 2030, (United Nations Department of Economic and Social Affairs, 2015).

Expanded programme on Immunization has improved the immunization situation worldwide since its establishment in 1974 through a World Health Assembly resolution and implemented in the mid-1980's (UNICEF/WHO, 2011). It's main purpose was to build upon the success of the global smallpox eradication programme, and to ensure that all children all over the world received vaccines in order to be protected from most infectious disease (WHO, 2013).

However, one of the problems encountered in conducting EPI is failure to reach an acceptable level of routine immunization coverage (WHO,2009). The World Health Organization (WHO) recommends that all children receive one dose of Bacille Calmette-Guérin (BCG) vaccine, three doses of pentavalent vaccine, three doses of pneumococcal vaccine, three doses of oral polio vaccine (OPV), two doses of rotavirus vaccine and two to three doses of measles vaccine after which a child is considered to be fully immunized (KDHS 2013-2014; KEPI 2014). The Kenyan immunization programme considers a child to be fully vaccinated if the child has received all basic vaccinations and three doses of pneumococcal vaccination (KDHS 2013-2014).

Immunization coverage levels and trends are important in monitoring the performance of immunization services locally, nationally and internationally; guiding strategies for the eradication, elimination and control of vaccine-preventable diseases; identifying areas of immunization systems that may require additional resources and assessing the need to

introduce new vaccines into national and local immunization systems. The WHO distinguishes vaccines and immunizations as; a vaccine as a biological preparation that is administered to improve immunity to a particular disease and immunization as the process of a person becoming immune or resistant to an infectious disease, typically by the administration of a vaccine(WHO,2000).

In the developing world, routine immunization is low at 60% compared to the developed world, which is above 80% (WHO,2009). Due to the low coverage, many children have died due to lack of immunization while others have been disabled (WHO, 2016). In Kenya the current infant mortality rate is estimated to be 39 per 1,000 live births (KDHS 2013-2014).

Immunization coverage in Kenya has remarkably increased from 57% in 2003 to 77% in 2013 . In 2014, it reduced to 75%. The highest proportion of children fully immunized in Kenya is in Nandi County (96.3%), Vihiga County has 94.4%, Tharaka -Nithi 95.3%, Machakos 90%, and Kisumu 78.9% (KDHS 2013-2014) thus suggesting that vaccine coverage is not uniform across the country. In 2012, immunization coverage across the six counties within the former Nyanza Province was: Nyamira 84.7%, Kisii 81.6%, Siaya 77.7%, Migori 71.5%, Kisumu 70.8% and Homabay 58.4% (DVI, 2012). Within Homabay County immunization coverage in Rangwe and Asego Sub-Counties in 2013 was 62% and 54.8% respectively (study was conducted when Asego and Rangwe were divisions, before the change of administrative units which led to existence of 8 sub counties in Homabay). The UNICEF EPI goal was to ensure routine immunization of children under one year reaches 90% nationally and 80% in every district or equivalent administrative unit by 2010 (UNICEF/WHO, 2011). Areas with low vaccine coverage such as Homabay potentially act as focal points for disease epidemics and transmission. Hence there was need to focus and understand why some areas had low coverage yet the government policy is applied uniformly across the different counties. Previous studies on vaccination coverage have examined influence of socio-demographic, cultural, knowledge & perceptions as well as health provider factors on vaccination coverage and still had different conclusions regarding the contributors to low immunization coverage. In Zimbabwe, factors associated with full immunization coverage were caregiver's post-secondary education, child's lower birth order, ANC attendance, delivering in a health facility, watching television frequently and higher socioeconomic status (Tinashe, 2015).



Therefore, this study was conducted with the aim of identifying those contributing to low vaccination coverage in Asego Sub County, Homabay County.

## **1.2. Statement of the Problem**

Immunization, an element of primary healthcare, is one of the cost-effective interventions of public health aimed at reducing morbidity and mortality associated with vaccine preventable diseases. In 2013, there were 145,700 deaths of children due to vaccine preventable diseases globally and about 38000 of these deaths were in Africa. Measles vaccination has averted deaths by over 75 % between 2000 -2013 globally (WHO, 2015). The UNICEF EPI goal aims at ensuring that immunization of children under one year of age reaches 90% nationally and 80% in every district. In 2003, the proportion of children fully immunized in Kenya varied from 79% in Central Province, to 38% in Nyanza. Five years later, Nyanza province still had the lowest coverage at 65% (KDHS 2008-2009) and much lower coverage of 63.6% in 2013(KDHS 2013-2014). The reasons for this low coverage and wide variations in comparison to neighboring counties still remain unknown. Lack of proper coverage will lead to outbreaks of epidemics such as the measles outbreak experienced in 134 districts in the country in 2012. Therefore, there was need to examine the influence of socio-demographic and economic, knowledge and perceptions as well as health provider factors on utilization of vaccination services in Homabay County.

## **1.3 Objectives**

### **1.3.1. Broad Objective**

To investigate factors influencing utilization of immunization services by caregivers of children aged less than 1 year in Asego Sub-County, Homabay County.

### **1.3.2. Specific Objectives**

- i. To identify socio-demographic and economic factors associated with low utilization of immunization services by caregivers of children aged less than 1 year in Asego Sub-County, Homabay County.
- ii. To determine the knowledge and perceptions of the caregivers of children aged less than 1 year on immunization and vaccine preventable diseases in Asego Sub-County, Homabay County.

- iii. To identify health provider factors associated with low utilization of immunization services by caregivers of children aged less than 1 year in Asego Sub-County, Homabay County.

#### **1.4. Research Questions**

- i. What are the socio-demographic and economic factors associated with low utilization of immunization services by caregivers of children aged less than 1 year in Asego Sub-County, Homabay County?
- ii. What is the knowledge and perceptions of caregivers of children aged less than 1 year on immunization and vaccine preventable disease in Asego Sub-County, Homabay County?
- iii. What are the health provider factors associated with low utilization of immunization services by caregivers of children aged less than 1 year in Asego Sub-County, Homabay County?

#### **1.5. Significance**

This study determined the factors contributing to low utilization of immunization services as; caregiver's being self-employed, earlier birth order, child place of birth at home, child's age as less than 14 weeks, and more than 4 ANC visits. The knowledge and perceptions associated with utilization of immunization services were such as thoughts that children completed vaccination at 10-59 months, perceptions that the child is not at risk of disease, not knowing return dates, lateness of health workers, travel time to facility of between 30 minutes to 1 hour and absence of a facility near their homes. Pinpointing these factors will enable identification of interventions and measures to be put in place so as to improve vaccination coverage and thereby attain the third sustainable development goal of ensuring healthy lives and promoting well-being for all at all ages. This would help in recommending strategies to improve the utilization of vaccines with the goal of reducing vaccine preventable diseases.

## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0: Introduction

Immunization is the process of delivering a vaccine and the subsequent immunity it generates within an individual and a population. Vaccines stimulate the body's own immune system in an attempt to protect the person against subsequent infection or disease. A person is made resistant to an infectious disease under conditions in which disease should result, typically by the deliberate exposure to antigens (WHO, UNICEF 2009).

**Table 2.0:** Schedule of recommended immunization in Kenya

<b>Time</b>	<b>Vaccine</b>	<b>Dosage</b>	<b>Route</b>	<b>Disease prevented</b>
<b>At birth</b>	Polio 0	2 drops	Oral	Polio
	BCG	0.05 mls	Intradermal	Tuberculosis
<b>At 6 weeks</b>	Polio 1	2 drops	Oral	Polio
	Pentavalent 1	0.5 mls	Intramuscular	Hib,Diphtheria,Pertusis, Tetanus,Hep B.
	Pneumococcal 1	0.5 mls	Intramuscular	Pneumonia
	Rotavirus 1	1.5mls	Oral	Diarrhea
<b>At 10 weeks</b>	Polio 2	2 drops	Oral	Polio
	Pentavalent 2	0.5 mls	Intramuscular	Hib,Diphtheria,Pertusis, Tetanus,Hep B.
	Pneumococcal 2	0.5 mls	Intramuscular	Pneumonia.
	Rotavirus 2	1.5 mls	Oral	Diarrhea
<b>At 14 weeks</b>	Polio 3	2 drops	Oral	Polio
	Pentavalent 3	0.5 mls	Intramuscular	Hib,Diphtheria,Pertusis, Tetanus,Hep B.
	Pneumococcal 3	0.5 mls	Intramuscular	Pneumonia
<b>At 6 months</b>	Measles	0.5mls	Intramuscular	Measles
<b>At 9 months</b>	Measles	0.5mls	Intramuscular	Measles
<b>At 18 months</b>	Measles	0.5mls	Intramuscular	Measles

Source: Adapted from KEPI, 2015.

*Note: Data was collected before measles at 18 months was incorporated into the KEPI schedule.*

\*Administered to HIV positive infants only. Most vaccines are given within the first 14 weeks of life.

## **2.1. Socio-demographic and Economic Factors Influencing Utilization of Immunization Services.**

Different communities have people with diverse cultures, values, socio-economic backgrounds and even religious affiliations which all may influence how individuals access health services (Egede, 2006). These variations are unique for every society and may affect recommended childhood routine immunization coverage levels and further determine herd immunity (John, 2000). These go a long way in determining susceptibility of individuals to infections and vaccine preventable diseases (Fine *et al.*, 2011).

A Study carried out in Bangladesh found out that more educated mothers tend to have fully vaccinated children than their less educated counterparts (Adhikary *et al.*, 2013). This is because being knowledgeable on the importance of vaccination was partly dependent on the level of education (Adhikary *et al.*, 2013). More-over , in Sudan higher rates of immunization were realized among children whose mothers were older and had a higher level of education (Van den Borne *et al.* 2007). A survey in Uganda revealed that immunization coverage in children varied by marital status, employment status, monthly income, education level, religion and age of the mother (Kamanda, 2010). High vaccine coverage was found in caregivers who were married, had post-secondary education, affiliation to a specific religious group(Christian and Muslim) , and were within an age bracket of 20-29 years (Kamanda,2010). Similarly, a study carried out in Bangladesh also showed some positive relation between immunization of the child and the economic condition of the household. Higher economic class families were shown to have better exposure to different forms of mass media service and provide for a higher social status thus an increased household income could increase acceptability of immunization (Biswas, 2001).

In Zimbabwe, factors associated with full immunization coverage were; mothers with secondary education and above were more likely to be vaccinated than children of uneducated mothers (Mukungwa, 2015). Children of the 1st birth order were more likely to be vaccinated than children of birth order of above 6, and those mothers who had attended ANC, delivered in a health facility, watched television frequently and were of higher socioeconomic status (Mukungwa, 2015). This study recommended additional research to gather an in-depth, qualitative knowledge on the barriers to full immunization which could uncover interesting insights around the established factors (Mukungwa, 2015).

A study carried out in Nakuru revealed that a mother whose child was born at a health facility was twice as likely to be immunized compared to a mother who delivered at home (Maina, 2013). Although two thirds of deliveries were conducted at a health facility, the number of home deliveries accounted for the remaining one third of deliveries in the area (Maina, 2013). However, it was noticed that infants whose mothers were Christians and in possession of at least secondary school education were more likely to be immunized than others (Odusanya, 2008)

The previous studies reviewed have contradicting responses regarding the contributors to low immunization coverage in different geographical regions. From the above literature, there are mixed responses as to how the different socio-demographic and economic factors affect utilization of immunization services. Homabay County has not attained the WHO recommended immunization coverage levels and has so far been enlisted as one of the polio high risk counties in an analysis conducted by the Ministry of Public Health and Sanitation in 2012 and 2013. Therefore, this study examined the influence these variables have on utilization of immunization services so as to better understand them. Obinna et.al, 2017 recommended that studies involving both primary quantitative and qualitative data collection by the researcher be conducted in order to identify individual and socioeconomic factors associated with childhood immunization coverage.

Furthermore, there is no documentation of studies which have compared utilization of immunization services between parent and non-parent caregivers. This region has consistently had low immunization coverage and as such this study compared utilization of immunization among parent and non-parent as well as between male and female caregivers, as part of the socio-demographic characteristics. Other socio-demographic characteristics shown to be associated with full vaccination coverage in other regions (birth order, ANC attendance, level of education and place of delivery) were evaluated in this study. In the light of the influence of these socio-demographic factors on immunization in other regions, it would be important to assess their contribution in regions with low immunization coverage such as Homabay County.

## **2.2. Knowledge and Perceptions of the Caregivers on Childhood Immunization and Vaccine Preventable Diseases.**

There are different perceptions, levels of knowledge on immunization among caregivers which determine the rates of utilization hence immunization coverage levels in different regions. In a New Zealand study on immunization of children, three quarters of parents were concerned more on the risk of side-effects than the perceived benefits of immunization. Negative perceptions of the parents about adverse effects of immunizations contributed to poor utilization of immunization services (Hamilton,2004). Similarly, determination of factors associated with refusal of childhood vaccines among parents of school-aged children in Colorado, Massachusetts, Missouri, and Washington in USA found out that the most common reasons given by caregivers for not immunizing their children were perceived vaccine safety, the perceptions that the child was not at risk for the disease, that the disease was not dangerous and that vaccines were not effective in disease prevention (Salmon,2005).

Odusanya, (2008) however disagrees with these findings as he found out that in rural Nigeria, most of the caregivers had positive attitudes towards childhood immunization and were knowledgeable about symptoms of vaccine preventable diseases. Three quarters of the respondents had a satisfactory level of knowledge on the benefits of immunization. (Odusanya, 2008).

In Uganda participants acknowledged immunization as a strategy for childhood survival since vaccine preventable diseases could cause severe outcomes in children such as physical disability and ultimately death. These diseases were perceived by most participants as common and their children as being at risk of contracting them unless immunized. Most of the participants also held a strong societal value of having healthy children through routine immunization in order to enable children's survival from vaccine preventable diseases so as to contribute to building a strong society (Babirye1,2011).

A study on immunization coverage and its determinants among children aged 12 - 23 months carried out in Nakuru, Kenya found out that participants who were advised by health workers on the importance of completing immunization schedules and return dates of either immunization or growth monitoring were 3 times more likely to receive full immunization compared to those who were not advised at all. The participants in this study gave reasons for not taking children for immunization such as; caregiver not being aware that the child was due for another vaccine, charges for services at the health facilities and shortage of

vaccines at the health facilities (Maina,2013). Another study in western Kenya revealed that immunization coverage among children under five years of age was negatively influenced by mother's attitude towards immunizations. Women who had a negative attitude were less likely to immunize their children (Omutanyi, 2005).

The studies reviewed above indicate that there still exist mixed responses on the knowledge and perceptions of caregivers on immunization. These could have resulted in the low immunization coverage. These studies indicate that caregivers still have a negative attitude towards childhood immunizations and that they still perceive children not to be at risk when not immunized as the risks of side effects outweigh the benefits of the immunization program. These mixed reactions and other perceived factors could be contributing to low immunization coverage in Homabay in spite of the Kenyan government rolling out uniform immunization strategies across the country. Despite the government improving information, education and communication on immunization and sensitizing the public via mass media across all areas, reasons for consistently low coverage in some areas are still not well understood. Lack of information on routine immunizations and misperceptions could be the reason for low utilization of vaccination services in Asego Sub county. Therefore, the current study determined the level of knowledge, and made comparisons of perceptions of male and female, parent and non-parent caregivers on immunizations and vaccine preventable diseases as well any other knowledge-related reasons for underutilization of immunization services.

### **2.3. Health Care Provider Factors Influencing Utilization of Immunization Services**

Care seeking behaviors are at times determined by infrastructure and systems in the health sector. Access to care is positively influenced by a well-staffed health sector, affordable services, availability of drugs and supplies, good attitude from the health workers, implementation of policies and guidelines uniformly and above all equity in distribution of services (Watt *et al.*,2016).

A study in rural Transkei found out that the reasons given for underutilization of childhood immunization services were; health facilities located far from home thus not easily reached, rude and unhelpful nurses attending to clients in the child welfare clinics and unavailability of vaccines in the health facility (Helman ,2004). This is consistent with a study carried out in Zambia which identified factors perceived by caretakers as barriers to health care for under-five children as: lack of quality healthcare especially on communication, attitude and

efficiency of the health workers (Halwindi, 2013). On inadequate staffing, it was realized that the health workers worked very hard but they were few hence unable to serve clients within the time required (Halwindi, 2013). Poor outreach programmes, bad scheduling of health programmes, long distances to the health facilities and unawareness of the importance of taking children for child health week to receive immunizations among caregivers was also identified as a barrier in this study (Halwindi,2013).

In Kampala, a study on factors affecting immunization behavior revealed that participants complained that health workers did not warn them about possible side effects or adverse events following immunization such as pain associated with administration of injectable vaccines. This study recommended on the need of health workers to improve the strategy of increasing immunization coverage through use of information, education, and persuasion of respondents on the benefits of immunization ( Babirye1,2011).

In Nairobi, Kenya health workers were insensitive and rude to caregivers thus discouraging them from returning to health facilities to complete the scheduled vaccinations (Owino, 2009). The respondents also reported unpleasant immunization practices such as stripping children for long on the long queues while waiting for the children to be weighed, punctuality of the health workers and even absenteeism (Owino, 2009). Obstacles to utilization of immunization services such as fee charges for vaccination services and vaccines running out of stock were also identified. This study suggested on the need for supportive supervision of health workers at the various health facilities to provide on job training to solve the obstacles identified (Owino, 2009). The study recommended that District Health Management Teams (DHMT's) should put in place a strategy to increase awareness and utilization of the immunization services in the area. Health workers should educate caregivers on side effects and adverse events following immunization, their management with simple remedies at home and that minor ailments are not a contraindication to immunization. In addition, the study suggested implementation of mechanisms for tracing defaulters (Owino, 2009).

A qualitative study conducted in Asia to determine factors limiting immunization coverage revealed that health workers thought that there were staff shortages and they had no transport for outreach activities. They were also concerned that many health facilities did not provide a consistent schedule of vaccination sessions or regular outreach sessions (Ruhul, 2013).



Another study on Provider's and User's Perspective about immunization coverage carried out in Chandigarh, India outlined the reasons for poor coverage as procedural delays of receiving supply of vaccines, lack of confidence between providers and caregivers, inadequate training of health workers, and poor follow ups for routine visits for immunization. They also cited staff shortages and unawareness of the public about vaccination as contributors to low coverage (Sharma, 2015).

The previous studies here have painted a negative picture about the health care system across different geographical regions. They mention rude, unhelpful nurses with bad attitudes and poor service delivery such as vaccine stock outs, distant facilities, inadequate staffing and poor outreach programmes (Halwindi 2013; Owino 2009; Babirye1 2011). The current study built upon the recommendations from previous studies and sought to evaluate the factors identified by previous researchers, in Asego Sub county as well as to determine existence of active defaulter tracing mechanisms and supportive supervision to staff at the facilities.

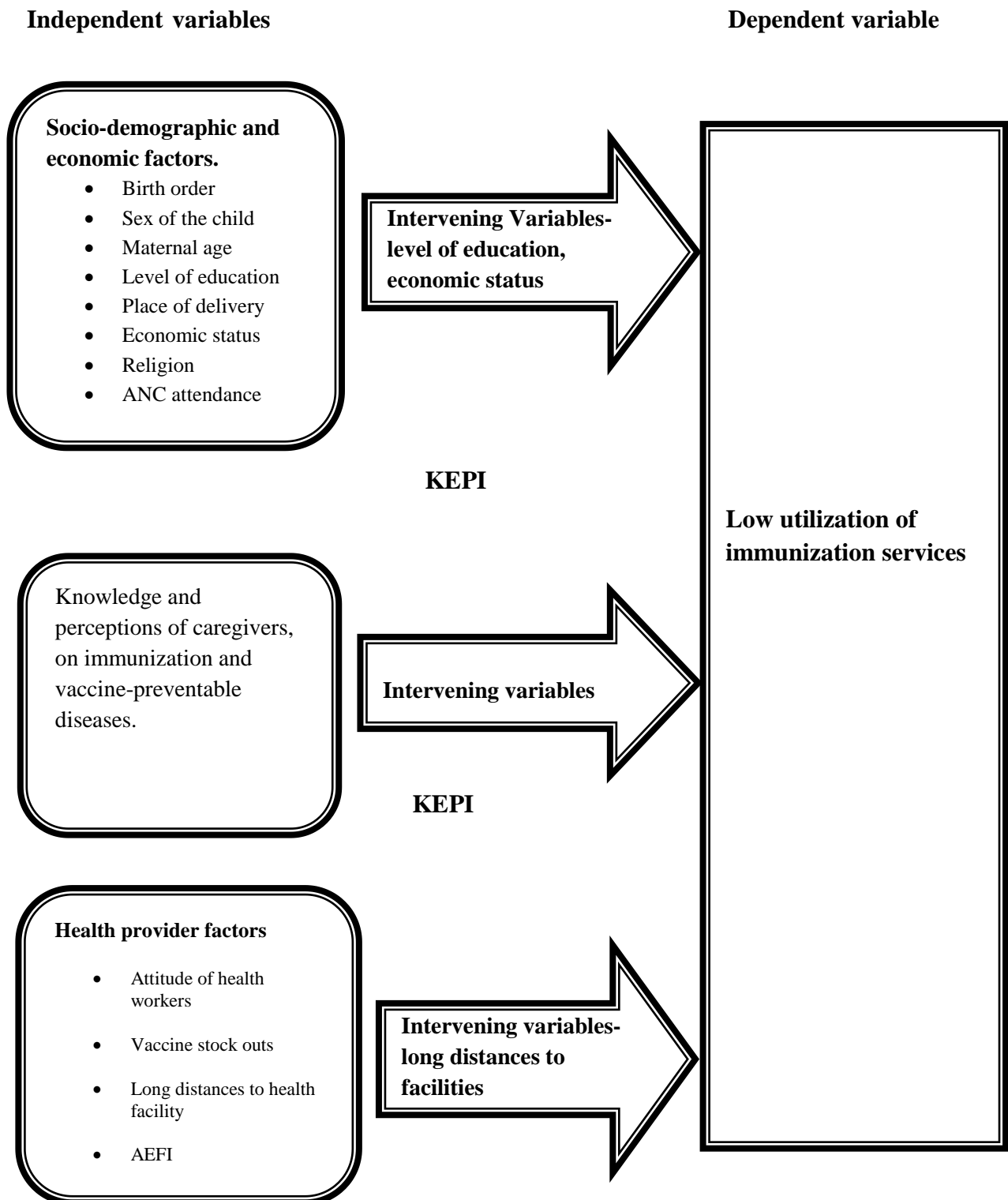
There are many factors affecting childhood immunization, such as factors associated with maternal belief, knowledge, attitude, and behavior regarding immunization, and also factors associated with health care providers such as staff shortages, work commitment, vaccine stock outs and attitude (Hamilton, 2004; Ruhul,2013). However, this study only focused on some selected socio-cultural, economic and demographic factors, associated with full vaccination status, knowledge and perceptions as well as health provider factors related to childhood immunization.

Homabay County was identified as the county within the former Nyanza province, having the lowest FIC coverage of 58.4%. (DVI,2012). Within the former Homabay district, immunization coverage in Rangwe and Asego Sub-Counties in 2013 was 62% and 54.8% respectively (Homabay District Report, 2011). During data collection, there was a transition from provincial to county governments and other sub counties such as Kasipul, Kabondo, Karachuonyo, Mbita, Suba and Ndhiwa had been formed and set up. Not all the sub counties had proportions of FIC coverage at this point in time.

Lack of proper coverage potentially leads to outbreaks of epidemics such as the measles outbreak in 134 districts in the country in 2012. A total of 3001 cases were reported and 31 deaths occurred (WHO, 2015). Furthermore, A polio risk analysis conducted by the Ministry of Public Health and Sanitation in 2012 and 2013 revealed that the polio high risk counties in Kenya are Mandera, Wajir, Garissa, Kisumu, Homa Bay, Busia, Kakamega, Vihiga, Turkana,

West Pokot, Trans-Nzoia, and Baringo. Homabay County was among the 11 high risk counties in Kenya which received the second round of polio campaign vaccines in August 2015. (WHO, 2015). Therefore there was need to identify the factors contributing to low immunization coverage in Asego Sub county, Homabay County .

## 2.4. Conceptual Framework



**Figure 2.4:** A framework showing the relationship between the dependent (utilization of immunization services) and independent variables (socio-cultural factors, health provider factors and knowledge and perceptions of caregivers).

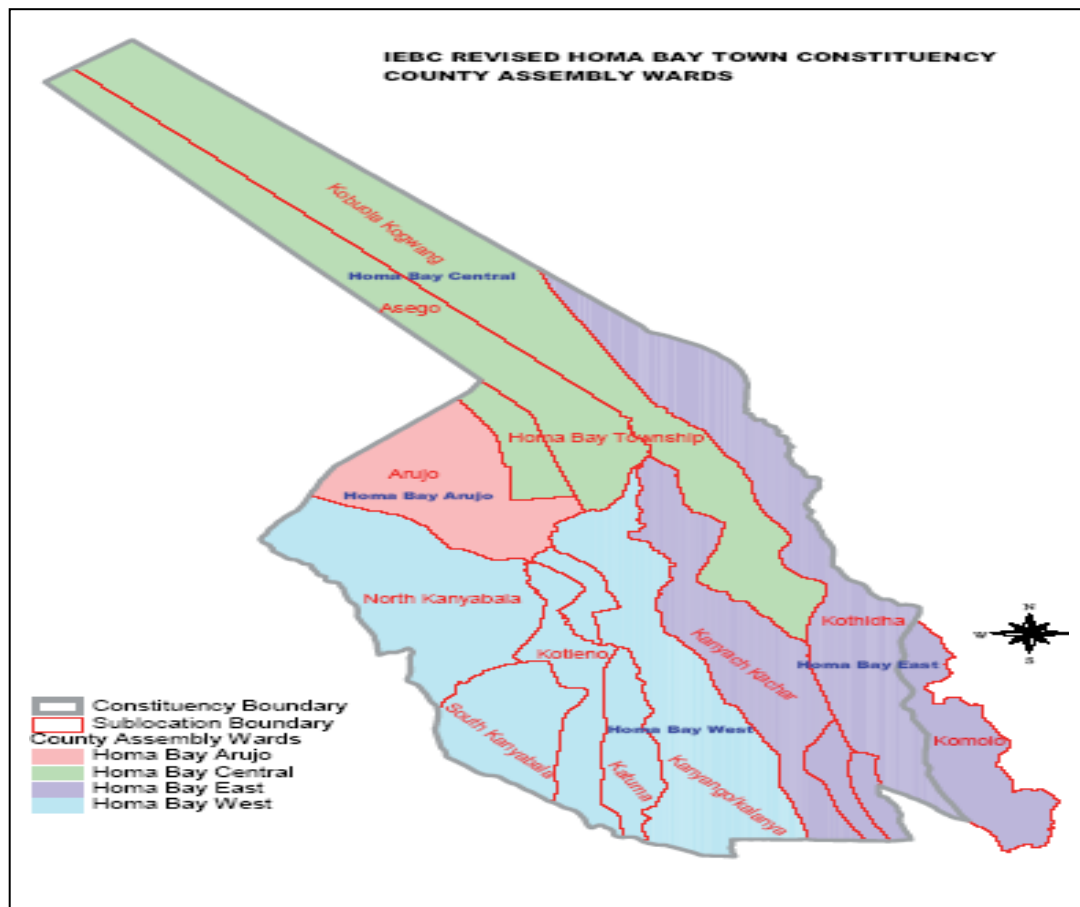
**Source:** Modified from Belachew Etana, 2011.

## CHAPTER THREE

### METHODOLOGY

#### 3.1. Study Area

The study was carried out in Homabay County, which is one of the 6 counties in the former Nyanza Province. It is located at -0.4731300 (latitude in decimal degrees), 34.4559900 (longitude in decimal degrees). Homabay borders Lake Victoria to the West and North, and the following Counties; Kisumu (Latitude: 0° 14' 60.00" N, Longitude: 34° 54' 59.99" E ) and Kericho (Latitude: 0° 22' 0.00" N, Longitude: 35° 17' 60.00" E ) to the North East, Nyamira (Latitude: 0° 44' 59.99" N, Longitude: 35° 00' 0.00" E ) and Kisii (Latitude: 0° 40' 0.00" N, Longitude: 34° 45' 0.00" E ) to the East, and Migori (Latitude: 0° 39' 59.99" N Longitude: 34° 49' 59.99" E) to the South. Homabay County has total of 8 constituencies Kasipul, Kabondo, Karachuonyo, Rangwe, Asego, Mbita, Suba and Ndhiwa. The capital of Homabay County is Homabay town. The County has a population of 963,794, and an area of 3154.7 km<sup>2</sup> (Kenya Census, 2009). Homabay County has 27 health facilities. (District Health Report 2012).



**Figure 3.1:** Map of Asego Sub-county, Homabay county.

**Source:** Independent Electoral and Boundaries Commission.

**Table 3.1:** List of health facilities in Homabay County.

<b>Facilities</b>	<b>Government</b>	<b>Mission</b>	<b>Private</b>	<b>Total</b>
Hospitals (level four)	2	1	0	3
Health Centres (level three)	3	1	0	4
Dispensary (level two)	13	6	0	19
Clinics (level two)	0	0	1	1
<b>Totals</b>	<b>18</b>	<b>8</b>	<b>1</b>	<b>27</b>

Health facilities were categorized into different levels and whether they were government, mission or private.

The study was carried out in Asego Sub-County, Homabay County. The Sub-County has a total of 3 locations, 11 sub locations and 60 villages. The total population in the Sub-County was 103,966 inhabitants with 21,813 households (Homabay District Health Report, 2012).

Asego is served by 10 health facilities. They are as shown below:

**Table 3.2:** List of health facilities in Asego Sub-County.

<b>Health facility</b>	<b>Type</b>
St.Pauls Level four hospital	Private
Wiga level two hospital	Government
Marindi level three hospital	Government
Homabay level four hospital	Government
Ogande level two hospital	Faith Based Organization
Nyamasi level two hospital	Government
Kijawa level two hospital	Government
Miniambo level two hospital	Government
Asumbi health centre	Faith Based Organization
Nyalkinyi dispensary	Government

**Source;** *Homabay District Report, 2011.*

### **3.2. Study Design**

This was a cross sectional study designed to collect information from a random sample of caregivers of children aged less than 1 year as well as health workers or administrators from the 10 health facilities in Asego Sub-county, Homabay County. Both quantitative and qualitative (focus group discussion and interviewer administered questionnaires) approaches were employed.

### **3.3. Study Population**

The total population consisted of 3211 caregivers with children aged less than 1 year (District Health Report, 2012) and 10 key informants who were nursing officers or administrators in charge of the 10 health facilities within Asego Sub-county.

### **3.4. Sample Size Determination**

The WHO EPI cluster sampling method, which is recommended in breast feeding and immunization surveys, was utilized (Milligan, 2004). It uses a standard sample size of 210 children. It has a standard confidence interval of 95% with results generated having a 10% precision (WHO, 1991).

This technique allows a small number of the target population to be sampled to provide statistically valid data. A cluster is a randomly selected group which in this case contains seven children in the age group you want to evaluate. A coverage survey contains 30 clusters and meets the following standards of reliability. Results from a survey using this cluster-sampling technique are generalizable to the population surveyed as a whole but does not permit comparisons between the different clusters or subsections of the total population surveyed. If comparisons are to be made in populations in different parts of the country, it would be necessary to conduct separate surveys in each area (WHO,1991).

However, the 30x7 method has some limitations. First, communities are selected with probability proportional to size (PPS) according to the most recent census data, but the data can be inaccurate and out of date, particularly with respect to fast-growing peri-urban areas. This means that such areas will be not be adequately represented in the sample, and the overall estimate of vaccine coverage will be biased. Second, the method does not select households from a sampling frame, but requires the interviewer to follow a random selection in the field, resulting in a cluster of households being selected within the community. This

procedure is open to conscious or unconscious bias of the interviewer, and does not lead to a sample selected with known probability. The sampling process allows for many children to be selected from the same household and is prone to selection bias as they have similar characteristics. Where there were multiple pregnancies such as twins, the same caregiver is allowed to respond to similar questions about two different children. Lastly, in case of non-response it is difficult to trace the initial respondent therefore the interviewer goes on to select the next household. This may lead to bias if non-responders differ systematically from those who had participated (Milligan *et al.*,2004).

Milligan *et al.*, acknowledges that the Expanded Program for immunization (EPI) random walk method has been widely used by the World Health Organization and others for rapid cluster sample surveys where an up-to-date household sampling frame is not available. However, it is noted that the method is not a probability sample, does not allow for population movement since the last census, does not ensure objectivity in household selection or permit call-backs for non-response (Milligan *et al.*, 2004).

### **3.5. Sampling Procedure**

The 30\*7 WHO EPI cluster sampling procedure was used whereby a sample of 30 clusters was selected and 7 children of the required age selected in each cluster. This technique was suitable as it is rare to find health records so complete and up-to-date that they contain current population of children aged 12 months and below (Bennet *et al.*,1991). This technique is also highly recommended in immunization and breast feeding surveys (Milligan, 2004).

Asego Sub-County was randomly selected from the others- Kasipul, Kabondo, Karachuonyo, Rangwe, Asego, Mbita, Suba and Ndhiwa, using a table of random numbers. The villages within Asego Sub-County were selected by probability proportionate to size (systematic sampling with a random start). A list of all the villages with an approximate number of the target population was randomly generated with a random start. The total population was then divided by 30 (sampling interval).

A random number between 1 and the sampling interval (30) was selected using a table of random numbers in order to identify the village on the cumulative population list in which the first cluster was selected. The random number must have been equal to or smaller than the sampling interval and must have the same number of digits as the sampling interval. The

sampling interval was then added to the random number in order to determine the next cluster. The remaining clusters were identified by adding sampling interval 28 times to the number used to identify the second cluster in order to determine the 30 clusters for sampling.

Each of the selected sites was identified and a central location within the site (church, market or mosque) selected. Upon reaching the central location, a pen was spun to select a random direction. This method considers central locations to be such as mosques, markets, churches and schools (WHO, 2008). The number of houses between the central location and periphery of the village (n) was determined. A random number (between 1 and n) was selected to determine the first household. The nearest next household was selected until 7 children were obtained for that cluster. This method allows for all eligible children (within this age range) in a household to be identified and their mother/caregiver interviewed (Milligan *et al.*,2004).

**Table 3.3:** WHO EPI Sampling Procedure for Asego Sub-County

Sub location	No.	Villages	Estimated Number (10-12 Months)	Cumulative Population.	Clusters
Kothidha	1	Maguje A	42	42	
	2	Maguje B	56	98	
	3	Majiwa Wandia	34	132	
	4	Ndori	36	168	
	5	Kabok	47	215	1
	6	Majiwa Kaluo	33	248	
			<b>248</b>		
Kanyach Kachar	7	Ndiru A	72	320	2
	8	Ndiru B	67	387	
	9	Ndiru C	58	445	3
	10	Ogande A	88	533	4
	11	Ogande B	74	607	
			<b>359</b>		
Kalanya Kanyango	12	Wakeru	77	684	5



---

	13	Kanyagwara	59	743	
	14	Nyakiya	64	807	6
	15	Kamlenye	58	865	7
			<b>258</b>		
Kobwola	16	Nyalkinyi A,	88	953	
Kogwang					
	17	Nyalkinyi B	67	1020	8
	18	Nyalkinyi C	64	1084	9
	19	Manga A	35	1119	
	20	Manga B	42	1161	
			<b>296</b>		
Kotieno	21	Wiamen A	46	1207	10
	22	Wiamen B	59	1266	
	23	Wiamen C	25	1291	11
			<b>130</b>		
Katuma	24	Ogongo A	36	1327	
	25	Ogongo B	48	1375	
	26	Ogoe A	42	1417	12
	27	Ogoe B	56	1473	
	28	Wiobambo	38	1511	13
			<b>220</b>		
North	29	Kobwana A	79	1590	
Kanyabala					
	30	Kobwana B	54	1644	14
	31	Ohongo Upper	45	1689	
	32	Ohongo Lower	39	1728	15
			<b>217</b>		
South	33	Akele A	18	1746	
Kanyabala					
	34	Akele B	14	1760	
	35	Watata A	21	1781	
	36	Watata B	16	1797	
	37	Nyakune A	17	1814	

---

	38	Nyakune B	13	1827	16
	39	Nyakahia A	20	1847	
	40	Nyakahia B	17	1864	
			<b>136</b>		
Arujo	41	Arunda	65	1929	17
	42	Rabuor Masawa	74	2003	
	43	Kaburini Upper	59	2062	18
	44	Kaburini Lower	71	2133	
	45	Ruga A	68	2201	19
	46	Ruga C	53	2254	20
	47	Nyagweno	49	2303	
		Lando			
	48	Ongonga	58	2361	21
	49	Misita A	62	2423	
	50	Misita B	54	2477	22
	51	Misita C	68	2545	
	52	Lala	87	2632	23
			<b>768</b>		
Homabay Town	53	Koginga Beach	109	2741	24
	54	Soko Mjinga	132	2873	25
			<b>241</b>		
Asego	55	Got Rabuor	48	2921	26
	56	Kogolla	54	2975	
	57	Rabuor Kalanya	61	3036	27
	58	Makongeni A	74	3110	28
	59	Makongeni B	62	3172	
	60	Kokodi Waunda	39	3211	29,30
			<b>338</b>	<b>3211</b>	

**Source;** *Homabay District Report, 2011.*

**Sampling interval** =3211/30

= 107

**Random number** =104

Seven children aged less than 1 year were selected from the 30 clusters and their caregivers identified for participation in the study. All the 10 administrators (nursing officers or administrators in charge) of the health facilities within Asego Sub-County were purposively sampled because they were few and not all facilities were offering vaccination services.

### **3.6 Eligibility Criteria**

#### **3.6.1 Inclusion Criteria**

Interviewer administered questionnaires were administered to consenting parent and nonparent caregivers who were at least 18 years of age, with children aged less than 1 year, and had been residing in Asego Sub-County at that time. They must have been residents of Asego for the last 12 months preceding the study.

#### **3.6.2 Exclusion Criteria**

Caregivers who were mentally challenged or had mental disorders were excluded from participation due to their inability to give informed consent.

#### **3.6.3 Human Subject Protection**

The consent forms were signed/thumb-printed by the respondents who agreed to participate in the study with no pressure or inducements of any kind being applied to encourage them to participate in the study. The respondents were also informed that the interviews would be conducted in privacy. Great caution was maintained in order to ensure that any identifying data of respondents from whom the information was obtained was to be kept strictly confidential. They were also assured that at the end of the study, any information revealing the identity of individuals who participated in the study will be destroyed. The consent forms clearly indicated that there was no compensation for the participant's time and information. Health Care workers were not allowed to attend the two FGD's held with caregivers, in order to allow them (caregivers) to speak openly so as to avoid fear of potential penalization by health workers.

### **3.7. Validity and Reliability of Data collection Instruments**

#### **3.7.1. Validity of instruments**

According to Amin (2005), validity is defined as the ability to produce findings that are in agreement with theoretical or conceptual values or to produce accurate results thus measuring what is supposed to be measured. In this study, scientific research methods were applied to design the data collection tool as well as the selection of the sample. Critically assessed instruments and scientific sampling techniques were utilized in order to minimize information bias.

To further establish the validity of the Questionnaire, a pre-test (pilot study) was conducted on 21 caregivers within the environs of 3 randomly selected health facilities in Kisumu County. The facilities selected were St.Monica hospital, Nyahera Health Centre and Nightingale nursing home. The reason for selection of 3 facilities for piloting was to have the three facility types (Private, Public and Faith-based) represented.

The purpose of the pre – test was to assess the clarity of the questionnaire so that those questions found to be inappropriate for measuring the variables were modified to improve their quality and appropriateness. The pre – test was conducted in Kisumu to ensure that those respondents who took part during piloting were not administered with questionnaires again during the actual data collection exercise.

For the FGDs, debriefings were held after each discussion between the moderator, note taker and the data analyzer to triangulate the understanding of the collected data.

#### **3.7.2. Reliability of the Instruments**

According to Amin (2005), reliability is defined as the level of internal consistency or stability of the measuring device over time. An instrument will be reliable if it produces the same results whenever it is repeatedly used to measure trait or concept from the same respondents even by other researchers. Reliability as a measure of the degree to which instrument yields consistent results or data after repeated trials. Reliability of research instrument refers to the consistency of the results tested by an instrument (Mugenda, 2003).

This study adopted a test re-test technique. Piloting was done to determine the stability and internal consistency of the data collection tool. Seven respondents from each of the three facilities selected in Kisumu County were administered with the questionnaire during two

different visits they made at these facilities. Their responses during both visits were compared, comprehension of each and every question was assessed and re-structuring done to questions which were not clear to the respondent to enhance comprehension.

### **3. 8. Data Collection Tools**

#### **3. 8.1. Household Interviews**

Data was collected using interviewer-administered questionnaires due to the fact that only 45% and 39% of women and men aged 15-49 years respectively in Nyanza are able to read (KDHS 2008-2009). Therefore, to consider respondents who could neither read nor write interviewer-administered questionnaires were used. The questionnaire was developed according to the research question and the objectives of the study (Appendix II).

Community health workers introduced the trained interviewers to each household. They then informed them of the purpose of their visit and sought consent to administer the semi-structured questionnaires.

#### **3.8.2 Focus Group Discussions**

A table of random numbers was used to select the FGDs and the specific facilities where the FGDs were to be conducted. The researcher was keen to ascertain that the two facilities where FGDs were not conducted were not within the villages selected among the 30 clusters in which the caregivers were interviewed. The caregivers were purposively sampled on the Child Welfare Clinic (CWC) days at these facilities. The first eight caregivers who had already been attended to at the CWC were asked if they were willing to participate in the FGDs. A total of 2 FGDs with 8 caregivers in each were conducted.

The study participants of the FGD's were assigned study identification numbers to maintain their privacy and confidentiality. The FGD's were audio recorded using digital recorders and uploaded to a password protected computer. The digital audio recording of the FGD's were not initiated until after the informed consent process was complete and initial introductions that included identifying information were completed. The recordings were kept under lock and key for the period of the study and were destroyed after the transcriptions were verified.

### **3. 8.3. Self-Administered Questionnaires**

Key informants, who were either health facility administrators or nursing officer in-charges at the health facilities, were administered with semi-structured questionnaires in order to collect data on health provider factors influencing utilization of immunization services. The questionnaires were collected within 3 days.

## **3. 9. Data Management and Analysis**

### **3. 9.1. Data Management**

Data was processed using the following steps: sorting, categorization, coding, entry, cleaning and validation. Data was appropriately recorded and edited to ensure accuracy and consistency.

### **3. 9.2 Data Analysis**

Data entry and cleaning was done in EPI Info. From qualitative data obtained from the FGD's. Key thematic areas were identified and organized into categories thus enabling identification and interpretation of patterns between and within the categories. The audio files were transcribed directly into Dholuo followed by translation to English after which the transcripts were converted into password protected Microsoft word files. Analysis of the FGD transcripts was done through identification of thematic areas. Univariate analysis was done for continuous variables (such as age, distance, travel time.) and bivariate analyses for categorical variables (such as religion, gender and marital status) using the Maximum Likelihood Ratio Chi Square test to investigate association between selected background characteristics (e.g. religion, level of education and gender) and the utilization of immunization services. A stepwise logistic regression method was used with socio demographic and economic (age, sex, level of education, marital status, family income, ANC attendance, delivery place, birth order, and health provider factors) and those that were significant at  $p \leq 0.2$  were retained in the model. This level was selected so as to allow for variables that might not be significant unless placed in the model. This cut off point also prevented removing variables that would potentially have an effect during multivariable analysis. Finally, factors which remained significant at  $p \leq 0.05$  after adjusting for all other confounding variables were considered independently associated with utilization of immunization services. Associations were reported in terms of odds ratios (OR) with 95%

confidence intervals (CIs). All analysis was performed using SAS version 9.2 (SAS Institute Inc., Cary, North Carolina, USA).

### **3.9.3 Data Storage**

This questionnaires and consent forms were stored in a lockable cabinet only accessible by the principal investigator. The transcripts were converted into password protected Microsoft word files and stored in a password protected computer.

All personal identifiers were removed from any paper study forms, which were coded only by numerical identifiers. Once the study is completed, all documents will be destroyed.

### **3.10. Ethical Considerations**

Permission was sought from Maseno University SGS and MUERC. Study was reviewed and approved by the MUERC under the Directorate of Research, Publication and Consultancy, Maseno University (Appendix VII). A written consent was issued to the caregivers for their approval with either a signature/thumbprint after explaining the aim of the study (Appendix I). Participation in the study was also out of free will; all participants were free to drop out of the study at any time, without being penalized.

#### **3. 10.1. Potential Risks and Benefits of Study to Participants**

Potential risks to participants in this study included social risks involved if information from participants revealed about their knowledge and perceptions on childhood immunization were to be disclosed outside of the research.

This study did not provide any direct benefits to the participants beyond any psychological benefits to participants possibly associated with sharing their insights and stories. Since there was no compensation to the participants, respondents were counseled and those found not to have immunized their children were informed on the benefits of immunization and encouraged to do so.

### **3.11. Dissemination**

The results got from this research will be published in relevant public health journals and presented at Workshops. The Thesis will be submitted to the Post graduate library at Maseno University.

## CHAPTER FOUR

### RESULTS

#### 4.1 Socio Demographic and Economic Factors

##### 4.1.1. Characteristics of the Caregivers

Of the 210 caregivers, 97.15%, (N=204) were female. The age of the caregivers ranged from 18-40 with a mean age of 25 and a median of 24. From 210 caregivers, 69.1%, N=145 had at least a primary education, 25.7 %, (N=54) secondary, 4.3 %, (N=9) tertiary and 1 %, (N=2) were illiterate. A majority of the caregivers 85.25 %, (N=179) were married, 8.6%, (N=18) single, 3.8%, (N=8) widowed and 2.4%, (N=5) were separated. About half of the respondents 49.5%, (N=104) were Protestants, 34.35%, (N=72) were Adventists, 15%, (N=32) were Catholics and only 1%, (N=2) were Muslims.

Majority (52.4%) of the respondents were self-employed, followed by housewives at 33.2 % and 6.2% were not employed. About half of the respondents earned less than kshs.1, 000 on a monthly basis.

There socio-demographic characteristics (of caregivers) which showed associations with utilization of immunization services after bivariate and multivariate analyses by logistic regression were self-employment; caregivers who were self-employed were 1.76 times (95%CI: 0.22 ,2.71) more likely to have their children immunized compared to those who were housewives (Table 4.1.1).



**Table 4. 1.1:** Socio - demographic characteristics of the caregivers in Asego Sub-County, Homabay County, December 2014.

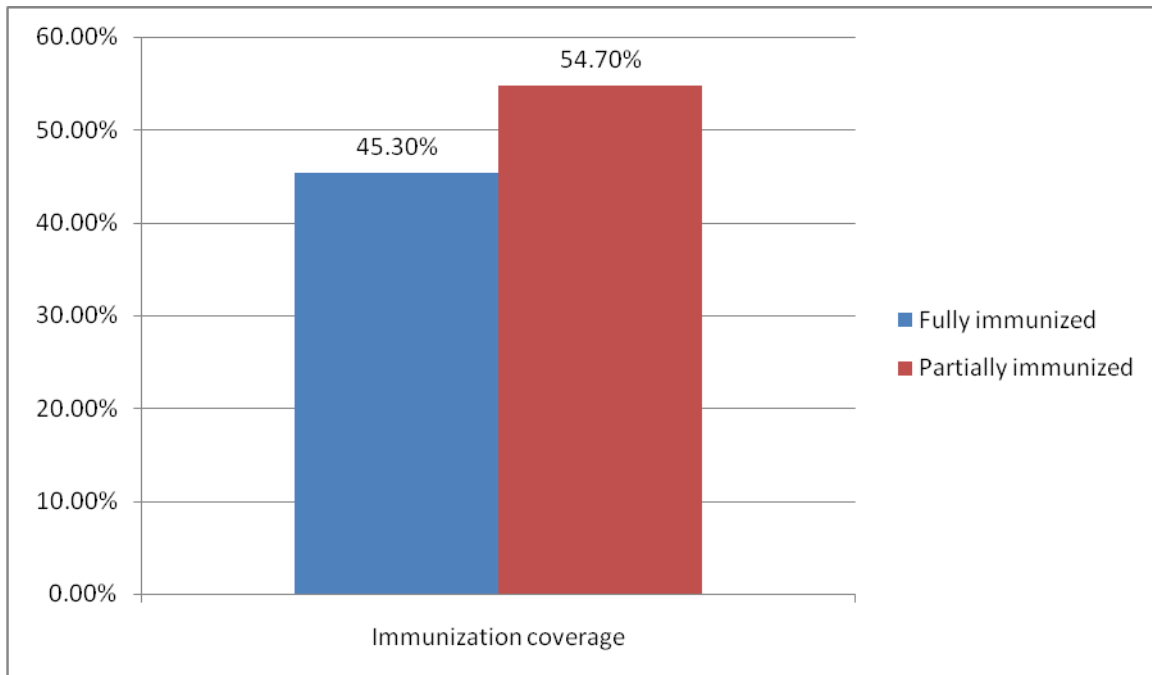
<b>Predictor</b>	<b>Variable</b>	<b>Yes(N= 59) %</b>	<b>No (N= 151) %</b>	<b>Total N = 210</b>	<b>Cluster Adjusted Odds Ratio (95% CI)†</b>	<b>p - value</b>
<b>Age group</b>	Less than 20 years	11 (30.6%)	25 (69.4%)	36	0.72(0.1226854 - 4.173719)	0.714
	20 - 30 years	31 (24.8%)	94 (75.2%)	125	Reference	
	31 - 40 years	17 (35.4%)	31 (64.6%)	48	0.94(0.3006768 - 2.909972)	0.908
<b>Educational status</b>	Primary education	38 (26.2%)	107 (73.8%)	145	Reference	
	Secondary education	18 (33.3%)	36 (66.7%)	54	1.01(0.4293295 – 2.416462)	0.969
	Tertiary education	2 (22.2%)	7 (77.8%)	9	0.61(0.9485654-1.8374611)	0.601
<b>Marital status</b>	Married	49 (27.4%)	130 (72.6%)	179	Reference	
	Single	6 (33.3%)	12 (66.7%)	18	2.31 (0.58724126 – 9.1786391)	0.233
	Widowed	4 (50.0%)	4 (50.0%)	8	1.09(0.1239471- 9.8358942)	0.936
<b>Religion</b>	Adventist	23 (31.9%)	49 (68.1%)	72	1.56 (0.8015973 - 3.067934)	0.225
	Catholic	12 (37.5%)	20 (62.5%)	32	2.00 (0.8651731 – 4.6718227)	0.654
	Protestant	24 (23.1%)	80 (76.9%)	104	Reference	
<b>Occupation</b>	House wife	17 ( 24.6%)	52 (75.4%)	69	Reference	
	Not employed	5 (38.5%)	8 (61.5%)	13	1.65 (0.1899371 - 14.38412)	0.649
	Employed in government	2 (25.0%)	6 (75.0%)	8	2.28(0.8395623-1.9473952)	0.759
	Employed in private sector	2 (28.6%)	5 (71.4%)	7	1.94(0.9361946-1.5284915)	0.524
	Self employed	32 (29.4%)	77 (70.6%)	109	<b>1.76 *(0.2160192 - 1.707177)</b>	<b>0.047</b>
<b>Income</b>	Less than 1000	12 (27.9%)	31 (72.1%)	43	Reference	
	1001 – 5000	9 (18.0%)	41 (82.0%)	50	0.56 (0.1178792 - 2.644144)	
	More than 5001	38 (31.9%)	81 (68.1%)	119	1.41 (0.2827098 - 7.047111)	0.674

CI-confidence interval, \* Significant at 95% CI, Odds ratio tested by Maximum Likelihood Chi-square test.

Legend: Yes-Vaccinated, No-Not Vaccinated.

#### 4.2. Fully Immunized Child (FIC) Coverage in Asego Sub-County

The percentage of children under one year who were fully immunized in Asego Sub-County was 45.3 %, ( N=59). The WHO EPI Cluster sampling technique has a precision rate of +/- 10% (WHO, 1991) , thus the expected FIC coverage in this area ranged between 35.3% to 55.3%.



**Figure 4.2:** FIC coverage in Asego Sub-County, Homabay County

The proportions of partially and fully immunized children in Asego Sub-County. The rates are 54.7% and 45.3% respectively. However, the differences were not statistically significant (p=0.22).

Fully vaccinated children had either received all basic vaccines within the first year or had received all age appropriate vaccines as per the KEPI schedule. Partially vaccinated children had not received all basic immunizations within their first year of life or had not received vaccinations appropriate for their age as per the KEPI schedule.

#### **4.2.1. Child Characteristics**

In this study, the basic sampling unit was the child aged less than one year. The interviewers asked the caregivers of the children sampled about various characteristics about their children such as; place of delivery, gender and birth order.

The 210 children aged less than one year consisted of male 38.7%, (N=82). It was noted that 30.2%, (N=64) of the children were aged less than 4 months, 29.5%, (N=55) between 4-6 months, 22.2%, (N=47) between 7-9 months and 21.7%, (N=46) above 9 months. Majority of the respondents had delivered their children at a health institution (73.55%), (N=150) and 91%, (N=192) of children had ever received some of the childhood immunizations. However, about 6.6%, (N=14) of the caregivers did not have their immunization booklets during the time of the study (Table 4.2.1). The 14 caregivers who did not have the child welfare booklets responded to questions asked by the interviewers who had to obtain information on immunization status from history (caregiver recall).

Children who were less than 14 weeks of age were 13.41 times (95%CI: 4.79, 37.56) more likely to be immunized compared to the children above 14 weeks of age. Children who were second borns were 2.47 (95% CI: 0.14, 1. 59) times more likely to be immunized in comparison to those who were of higher birth order (Table 4.2.1).

**Table 4.2.1.** Characteristics of the study children aged between 0 - 12 months in Asego Sub-County, Homabay, December 2014.

		Yes(N= 59)	No (N= 151)	Total	Cluster Adjusted Odds Ratio	
Predictor	Variable	%	%	N = 210	(95% CI)†	p- value
Sex	Male	23 (28.1%)	59 (71.9%)	82	1.02(0.5212836 - 1.987581)	0.928
	Female	36 (28.1%)	92 (71.9%)	128	Reference	
Age group in weeks	0 - 6 weeks	16 (53.3%)	14 (46.7%)	30	<b>8.80 *(3.180158 - 24.3458)</b>	<b>0.000</b>
	7 - 10 weeks	10 (58.8%)	7 (41.2%)	17	<b>11.36 *(4.016667 - 32.14637)</b>	<b>0.000</b>
	11 - 14 weeks	15 (65.2%)	8 (34.8%)	23	<b>13.41* (4.788583 - 37.56376)</b>	<b>0.000</b>
	More than 14 weeks	18 (12.7%)	124 (87.3%)	142	Reference	
Birth order	First	6 (19.4%)	25 (80.6%)	31	1.38(0.1310308 - 1.116803)	0.079
	Second	7 (22.6%)	24 (77.4%)	31	<b>2.47*(0.1398117 - 1.590387)</b>	<b>0.0226</b>
	Third and above	46 (31.1%)	102 (68.9%)	148	Reference	

CI-confidence interval, \* Significant at 95% CI, Odds ratio tested by Maximum Likelihood Chi-square test.

Legend: Yes-Vaccinated, No-Not Vaccinated.

Age grouping done as per schedule of routine immunizations. The table shows that children who were less than 14 weeks of age and those who were second borns were more likely to be immunized.

It is clear that most children whose caregivers participated in the study were female, more than 14 weeks, had ever received an immunization, and were of higher birth order or were neither first nor second borns to their families.

The characteristics of the study children which indicated associations with utilization of immunization services among the children in Asego Sub-County were age and birth order.

#### **4.2.2. Maternal Health Characteristics**

The recommended number of ANC visits according to the WHO for every pregnancy is 4. The ANC visits ranged between 1 and 4 with a mean of 3 visits. There were however about 15.7%, (N= 33) respondents who had more than 4 ANC visits. The caregivers who had more than 4 ANC visits were 2.18 (95% CI: 1.01, 4.64) times more likely to immunize their children compared to those who had between 1 and 2 ANC visits.

The caregivers who delivered at home were 52% ,0.48 (95% CI: 0.22,1.02) less likely to immunize their children compared to those who delivered at a health institution (Table 4.2.2).

**Table 4.2.2:** Maternal Health Characteristics among caregivers of children aged 0 - 12 months in Asego Sub-County, Homabay County, December 2014.

		Yes(N= 59)	No (N= 151)	Total	Cluster Adjusted Odds Ratio	
Predictor	Variable	%	%	N = 210	(95% CI)†	p-value
<b>Number of ANC visits attended</b>	1 - 2 visits	11 (23.4%)	36 (76.6%)	47	1.06 (0.4002553 - 2.829174)	0.901
	3 - 4 visits	30 (25.6%)	87 (74.4%)	117	Reference	
	More than 4 visits	15 (45.5%)	18 (54.5%)	33	<b>2.18* (1.019651 - 4.640004)</b>	<b>0.044</b>
<b>Delivery place</b>	At home	9 (16.7%)	45 (83.3%)	52	<b>0.48* (0.2236208 - 1.020431)</b>	<b>0.0056</b>
	At health institution	48 (32.0%)	102 (68.0%)	150	Reference	
<b>Experienced child death</b>	Yes	8 (20.5%)	31 (79.5%)	39	0.54 (0.1666326 - 1.720203)	0.294
	No	50 (29.6%)	119 (70.4%)	169	Reference	

CI-confidence interval, \* Significant at 95% CI, Odds ratio tested by Maximum Likelihood Chi-square test.

Legend: Yes-Vaccinated, No-Not Vaccinated.

The maternal characteristics evaluated were the number of ANC visits, place of delivery and occurrence of child death. Having more than 4 ANC visits and place of delivery showed significant associations with immunization.

### **4.3. Knowledge levels of caregivers on immunizations and vaccine preventable diseases**

#### **4.3.1. Knowledge of Vaccines and Vaccine Preventable Diseases**

The knowledge on vaccines and vaccine preventable diseases among the 210 caregivers was evaluated. They were asked about the importance of immunizing a child and 92.3%, (N=193) thought that immunization was important because it prevents the child from getting diseases whereas 7.7 %, (N=16) thought that immunization is useful as it treats specific diseases.

When asked about age at which a child completes immunization, more than half (58.3%) of the caregivers responded at 60 months and above, whereas 25.5%, (N=54) thought that immunizations are completed at 9 months.

The caregivers who thought that age for vaccine completion was between 10-59 months, and thereby didn't know the correct times of completion of immunization were 80% less likely 0.20 (95%CI: 0.06, 0.66) to vaccinate their children compared to caregivers who knew the correct age for completing vaccinations, at 9 months (Table 4.3.1).

**Table 4.3.1:** Association between caregivers knowledge on vaccination and immunization utilization in Asego Sub-County, Homabay.

Predictor	Variable	Vaccination Uptodate		Total	Cluster Adjusted Odds Ratio	P - value
		Yes % (N)	No % (N)		(95% CI)†	
<b>Importance of immunization</b>	To prevent diseases	28.3% (54)	71.7% (137)	191	Reference	
	To treat specific diseases	31.3% (5)	68.7% (11)	16	2.01 (0.5949424 - 6.757051)	0.262
<b>Heard about vaccines from</b>	Health worker	28.0%(26)	72.0%(67)	93	Reference	
	Television	33.3%(22)	66.7% (4)	26	0.78 (0.3698118 - 1.629007)	0.503
	Friend	9.1%(2)	90.9% (20)	22	0.62 (0.0848011 - 4.562506)	0.641
	Radio	32.9%(28)	67.1%(57)	85	1.59(0.06734563-3.693760)	0.942
<b>Number of symptoms of vaccine preventable diseases known</b>	0 symptoms	4 (20.0%)	16 (80.0%)	20	Reference	
	1 - 2 symptoms	38 (27.7%)	99 (72.3%)	137	1.83 (0.6011425 - 5.54883)	0.288
	3 or more symptoms	12 (29.3%)	29 (72.7%)	41	Reference	
<b>Age at immunization initiation</b>	Just after birth	31.4% (49)	68.6% (107)	156	Reference	
	Any time	23.1% (3)	76.9% (10)	13	0.34 (0.081055 - 1.710411)	0.204
	One month after birth	16.2% (6)	83.8% (31)	37	0.44 (0.1449649 - 1.335231)	0.147
<b>Age at immunization completion</b>	Less than 9 months	12.5% (1)	87.5% (7)	8	0.100 (0.0080552 - 1.24292)	0.073
	At 9 months	38.9% (21)	61.1% (33)	54	Reference	
	Between 10 - 59 months	19.2% (5)	80.8% (21)	26	<b>*0.20 (0.0637203 - 0.6651455)</b>	<b>0.008</b>
	60 months and above	26.2% (32)	73.8% (90)	122	0.46 (0.2096026 - 1.006032)	0.052

CI-confidence interval;  $p < 0.05$ , \* Significant at 95%CI, Odds ratio tested by Maximum Likelihood Chi-square test. Legend: Yes-Vaccinated, No-Not Vaccinated. Majority of the respondents thought that vaccination was completed after 9 months (*data was collected before measles at 18 months was added to the KEPI schedule*).

The table shows that those who didn't know the correct age of completion of immunization had lesser chances of having their children vaccinated.



### 4.3.3. Perceptions of Caregivers On Immunizations

The caregivers were also asked whether they thought a child was at risk of diseases if not immunized, whether they thought vaccines were safe when administered to the child, if they thought vaccines were effective and if the health worker informed them of the return dates for immunizations for their children .It was realized that 28.75% of the caregivers thought that a child was at risk of diseases if not immunized, 28.10 % thought that vaccines were safe when administered to the child, 27.7% thought that vaccines were effective in preventing VPD's whereas only 27.45% of the caregivers were informed of the return dates.

After a bivariate and multivariate analyses, it was realized that the caregivers who didn't think the child was at risk of disease in not vaccinated were 52% less likely ,0.38 (95%CI: 0.09, 1.49) to have their children vaccinated compared to those who thought otherwise . Those who were not informed of the return dates by the health workers were 81% less likely ,0.19 (95%CI: 0.05,0.64) to immunize their children in comparison to those who were informed. (Table 4.3.3)

**Table 4.3.3:** Perception of caregivers on vaccines and their association with immunization utilization in Asego Sub-County, Homabay ,December 2014.

Variable	Vaccination Up to date			Cluster Adjusted Odds Ratio	p- value
	Yes % (N)	No % (N)	Total	(95% CI)†	
<b>Think a child at risk of diseases if not vaccinated</b>					
Yes	28.8% (55)	71.2% (136)	191	Reference	
No	14.3% (2)	85.7% (12)	14	<b>0.38 *</b> <b>(0.0949953 - 1.494602)</b>	<b>0.0165</b>
<b>Think that vaccines are safe</b>					
Yes	27.7% (47)	72.3% (123)	170	Reference	
No	30.0% (12)	70.0% (28)	40	0.43 (1.120491 - 5.2701)	0.25
<b>Think vaccines effective in preventing diseases</b>					
Yes	30.1% (49)	69.9% (114)	163	Reference	
No	19.6% (9)	80.4% (37)	46	0.48 (0.2419243 - 0.9510527)	0.35
<b>Informed on the return date by health worker</b>					
Yes	32.6% (56)	67.4% (116)	172	Reference	
No	7.9% (3)	92.1% (35)	38	<b>0.19*</b> <b>(0.0555966 - 0.6425611)</b>	<b>0.008</b>
<b>Educated on importance of completing immunization</b>					
Yes	32.0% (48)	68.0% (102)	150	Reference	
No	17.0% (10)	83.0% (49)	59	0.65 (0.2409174 - 1.770934)	0.403
<b>Think immunization will make the child sicker</b>					
Yes	28.8% (19)	71.2% (47)	66	Reference	
No	27.8% (40)	72.2% (104)	144	0.94 (0.5205694 - 1.681419)	0.824

CI-confidence interval; p<0.05, \* Significant at 95% CI, Odds ratio tested by Maximum Likelihood Chi-square test. Legend: Yes-Vaccinated, No-Not Vaccinated.

#### **Text box 4.1: Perceptions of Caregivers on Immunizations**

##### **Theme 1: Knowledge, Attitude and Perceptions on immunization**

Regarding theme 1, participants were asked to mention local names of the vaccine preventable diseases against which children are immunized. Some of them were able to correctly identify some of the common VPDs and also mention their local names. They mentioned a few of the diseases such as: “*Measles is known as ‘angiew’* [ **mother of 2 children, FGD 1**]” ; “*Polio is also known as ‘abach’* [ **mother of 2 children, FGD 2**]. However, some of them did not correctly identify the names of some diseases but were able to mention the preventive strategies for the disease: “*Tetanus is known as ‘adhola’, since if you have a wound, you will go for a tetanus injection* [ **All participants respond in unison, FGD 1**]”.

The caregivers were also asked the number of times a child aged less than one year receives immunizations. There were mixed responses as the caregivers were not certain of the immunization schedule: “*A child is immunized three times, at first he is injected twice, two in two months and two in three months and then the last one he is injected when he is nine months. No! Four times, plus that one at nine months.* [ **mother of 3 children ,FGD 2**].

Most of the caregivers mentioned not knowing some of the vaccines, “*With me I see that polio is given at 3 months, and the one given at nine months, is for measles. And that’s the end of immunization? We don’t know the one given on the forearm. And also the ones given on the thighs, the ones we come for three times, we don’t know them very well. We only know the one given at nine months, which it’s for measles.* [ **mother of 5 children, FGD 1**]

The caregivers were also asked on the correct age of a child completing immunization: “*Up to five years!* [ **mother of 3, FGD 1**]”. **Another caregiver said,** “*I’m saying that, “when he has finished nine months. So after that, you can just*

#### **4.4. Health Provider Factors**

##### **4.4.1 Health provider factors from the Caregivers perspective.**

###### **4.4.1.1 Malpractices and reasons for defaulting utilization of immunization services.**

The caregivers of children were asked about which malpractices were present among health workers at the health facilities where they immunized their children. Among those who mentioned lack of vaccines at the health facilities and had immunized their children were 25.9%, those who cited poor communication from the health worker and had not immunized their children were 79.7%. Lateness of health workers was the most prominent malpractice cited by the caregivers.

The caregivers who defaulted immunizations were asked their reasons for doing so; not knowing whether to come back for second and third vaccination, not knowing vaccination time and site, inconvenient vaccination times and absenteeism of vaccinators as well as lack of awareness on the importance of vaccination were the most common reasons for defaulting childhood immunizations enlisted.

The malpractice which showed significant associations was lateness of the health worker whereby caregivers who responded that the health workers report late were twice as likely to immunize their children compared to those who did not report lateness 2.21(95% CI:1.15-4.26) (Table 4.4.1.1)

**Table 4.4.1.1:** Malpractices and reasons for defaulting given by caregivers and the distribution of children whose immunization is up-to-date in Asego Sub-County, Homabay, December 2014

Predictor	Vaccination Up todate			Total	Cluster Adjusted Odds Ratio (95% CI)†	p - value
	Variable	Yes % (N)	No % (N)			
<b>Malpractices about child immunization</b>						
Lack of vaccines at the health facility	Yes	25.9% (35)	74.1% (100)	135	Reference	
	No	24 (32.0%)	51 (68.0%)	75	1.23 (0.5825488 - 2.598414)	0.587
Poor communication from the health worker	Yes	20.3% (16)	79.7% (63)	79	0.55 (0.2879192 - 1.039836)	0.066
	No	67.2% (88)	32.8% (43)	131	Reference	
Rude health workers	Yes	26.8% (19)	73.2% (52)	71	1.07 (0.5922948 - 1.917878)	0.832
	No	28.8% (40)	71.2% (99)	139	Reference	
Absenteeism of health workers.	Yes	28.0% (7)	72.0% (18)	25	0.87 (0.5922948 - 1.917878)	0.832
	No	28.1% (52)	71.9% (133)	185	Reference	
Unpleasant practices	Yes	27.5% (11)	72.5% (29)	40	0.87 (0.5155703 - 1.473418)	0.608
	No	28.2% (48)	71.8% (122)	170	Reference	
Lateness of the health workers	Yes	40.7% (22)	59.3% (32)	54	<b>2.22 *(1.122261 - 4.375201)</b>	<b>0.022</b>
	No	23.7% (37)	76.3% (119)	156	Reference	
Inadequate staffing.	Yes	28.6% (18)	71.4% (45)	63	0.91 (0.4461071 - 1.872117)	0.806
	No	27.9% (41)	72.1% (106)	147	Reference	

**Table 4.4.1.1... Continued**

Predictor	Vaccination Up to date			Total	Cluster Adjusted Odds Ratio (95% CI)†	p - value
	Variable	Yes % (N)	No % (N)			
<b>Reasons for defaulting</b>						
Vaccination site is far-away	Yes	0.0% (0)	100.0% (35)	35	-	-
	No	33.7% (59)	66.3% (116)	175	Reference	
Vaccination time is inconvenient	Yes	12.5% (1)	87.5% (7)	8	0.71 (0.0657101 - 7.706064)	0.780
	No	28.7% (58)	71.3% (144)	202	Reference	
Absenteeism of vaccinators	Yes	25.0% (1)	75.0% (3)	4	3.34 (0.0276106 - 403.0103)	0.622
	No	28.2% (58)	71.8% (148)	206	Reference	
Lack of awareness on the importance of vaccination	Yes	0.0% (0)	100.0% (30)	30	-	-
	No	32.8% (59)	67.2% (121)	180	Reference	
Not knowing vaccination time	Yes	4.8% (2)	95.2% (40)	42	Reference	
	No	33.9% (57)	66.1% (111)	168	5.65 (1.313844 - 24.32792)	0.20
Not knowing whether to come back for second and third vaccination	Yes	11.8% (2)	88.2% (15)	17	1.13 (0.3145651 - 4.034433)	0.855
	No	29.5% (57)	70.5% (136)	193	Reference	

CI-confidence interval; p<0.05, \* Significant at 95%CI, Odds ratio tested by Maximum Likelihood Chi-square test. Legend: Yes-Vaccinated, No-Not Vaccinated.

Table 4.4.1.1 is a summary of the malpractices as stated by the caregivers. Lateness of health workers had a negative effect on childhood immunizations.

#### **4.4.1.2. Health facility and health provider characteristics associated with utilization of immunization services.**

The caregivers were also asked about presence and type of the health facility near them, how long it took them to travel to the health facilities, and whether they were asked to pay for immunization services. From among their responses, those that showed significant associations were time to reach the health facilities and presence of a health facility near their homes.

Those who reported that it took them between 30 minutes to 1 hour to travel to the health facility were 28% less likely to immunize their children as compared to those who travelled for 15-30 minutes 0.72 \*(95% CI; 0.30 -1.69). Caregivers who responded that they didn't have a health facility near were 34% less likely to vaccinate their children compared to those who had a facility near, 0.66\*(95% CI:0.49,1.93) (Table 4.4.1.2)

**Table 4.4.1.2:** Health provider factors associated with immunization utilization in Asego Sub-County, Homabay County, December 2014

		Yes(N= 59)	No (N= 151)	Total	Cluster Adjusted Odds Ratio	
Predictor	Variable	%	%	N = 210	(95% CI)†	p - value
<b>Time to reach health facility</b>	Less than 15 min	6 (30.0%)	14 (70.0%)	20	1.01 (0.3414428 - 3.014539)	0.979
	15 - 30 minutes	28 (34.6%)	53 (65.4%)	81	Reference	
	30 min - 1 hour	11 (26.2%)	31 (73.8%)	42	<b>0.72* (0.3027442 - 1.691785)</b>	<b>0.045</b>
	More than 1 hour	14 (20.6%)	54 (79.4%)	68	0.68 (0.1616359 - 2.856071)	0.598
<b>Pay for immunization</b>	Yes	12 (34.3%)	23 (65.7%)	35	1.16 (0.4427196 - 3.045882)	0.761
	No	47 (27.0%)	127 (63.0%)	174	Reference	
<b>Warned in advance of Adverse Events</b>	Yes	39 (29.1%)	95 (70.9%)	134	Reference	
	No	19 (25.3%)	56 (74.7%)	75	0.78 (0.3666239 - 1.667388)	0.524
<b>Health facility offering immunization near(2kms)</b>	Yes	48(32.9%)	98(67.1%)	146	Reference	
	No	11(17.2%)	53(82.8%)	64	<b>0.66*(0.490976-1.932174)</b>	<b>0.025</b>
<b>Health facility type near respondent's home</b>	Health center	6 (31.6%)	13 (68.4%)	19	1.19 (0.3867736 - 3.655781)	0.762
	Hospital	18 (47.4%)	20 (52.6%)	38	2.81* (1.110626 - 7.125655)	0.29
	Dispensary	23 (25.8)	66 (74.2%)	89	Reference	
	Private clinic	0 (0.0%)	2 (100%)	2	-	

CI-confidence interval, Ref- Reference, \* Significant at 95% CI, Odds ratio tested by Maximum Likelihood Chi-square test. Legend: Yes-Vaccinated, No-Not Vaccinated.

Table 4.4.1.2 above summarizes the health provider factors cited by the caregivers. Most of the caregivers took roughly 15-30 minutes to reach the nearest health facility; however, those who took 30mins-1 hour to arrive at the facility and those who reported not having a health facility near were less likely to vaccinate their children.



#### 4.4.1.3 Health provider factors from the FGDs conducted among Caregivers

The caregivers enlisted various sources of information about immunizations such as the road announcements, health workers, friends and community health workers. Of these sources, the most credible sources were road announcements and health workers. The caregivers also stated poor communication from the health worker especially with the child welfare booklet. Details were documented in these booklets on every visit but no education or communication on what was documented was made.

There were mixed responses regarding warning of caregivers about Adverse Events Following Immunization. They stated only being told of management of the adverse effects.

The caregivers also mentioned that lack of vaccines, long queues and staff shortages were among the dislikes they had about taking children for immunization (Textbox 4.2).

**Textbox 4.2:** Caregivers' perspectives on health provider factors affecting utilization of immunizations.

#### **Theme 2: Health provider factors and vaccination services.**

Theme 2 focused on the areas the caregivers felt were to be improved upon by the health workers. One of the areas noted by the caregivers was poor communication which created a gap in receiving information. Some of them brought up not receiving any information from the health provider, yet they were issued with the MCH booklet: *“When we are issued with this book, there is nothing we are told about it. [Other participants agree...] Once you have given birth, a book is just placed on your hands and when you go back to the hospital after delivery, you are asked for it. But the doctors do not explain anything to you [Mother of 4, FGD 1]”*. Another one said, *“With me I was given the book but not told of its use. But if you read it, you will find your name and that of the baby and some educative literature inside [Mother of 2 , FDG 2].”*

The caregivers also mentioned vaccine stock outs as an area to be improved on by the health providers at health facilities. One of them said, *“There are times when you come and find it open just that the vaccine that you were to be given is not there. At times, a woman whose child was to be given measles is at times promised to go and come back several times, that the woman finally gives up, leaving the child unimmunized. [Mother of 4 ,FGD 2]”*.

Participants also mentioned staff shortages at the facilities. Some facilities were well staffed but the nurses were not at the facilities during the days the participants went to get their children vaccinated: *“At times you come for the vaccination and find very few nurses. Though they are many at the facility, you find that they have gone for meetings. You find that in a facility, at times, there are only two nurses, remaining. One is serving on this side, the other on the other side. At times one is also serving the maternity. So you find that for you to be served, at times you came early, but for you to be served, it will take time. So if you can add more nurses on this immunization side, then women will just bring the children for immunization [Mother of 2 ,FGD 2]”*. One said, *“I just want to emphasize what my sister had already said that, the shortage of doctors brings us a lot of challenges, because in Homabay, when we went for clinic previously, we were first taught, it’s when we went for the clinic. But of late, here we are not taught, because the doctors are few. That’s where I wanted to support. [Other participants agree ....] [Mother of 5, FGD 1]”*.

Participants also claimed not having received any warning about adverse events before the vaccines were administered: *“ No we haven’t heard of that before our children are immunized. [All participants from FGD 1 acknowledge in unison] No they don’t explain to us! It’s only that, once your child has been injected, you are told to go give him panadol. That’s all. And so we just assume that with this panadol we are told to give to the child, seems like he will have fever. So I will go give him panadol, to help relieve the fever. Otherwise, we are not told in advance what the panadol will do. [Mother of 4, FGD 1]”*.

### **Text box 4.3:** Reasons for Defaulting Childhood Immunization Services

#### **Theme 3: Reasons for defaulting vaccination services.**

The third theme concentrated on the reasons why caregivers defaulted vaccination services. One of the caregivers mentioned religious groups which did not advocate for vaccination of children: *“Some people is religion. Some believe in religion, that a child is not supposed to be immunized but is to be prayed for, and no disease will attack him/her. And what will happen to you if you bring your child for vaccination and belong to that church? [Interjects, the moderator] You will be excommunicated from the church . [Mother of 2, FGD 2]*

Poverty was also mentioned by some of the participants as a reason for not having their children immunized. They did not take their children for vaccination because they had no transport to the health facilities. However, they were not asked to pay for the vaccines at the health facilities: *“Poverty also prevents people from bringing their children for immunization. Yes, you can get a person who is so poor that he even doesn't have money for bringing the child to the clinic. At times when you come to the clinic, are you charged? [Interjects the moderator] No we are not charged, but transport! [Mother of 4, FGD 2]* Another one said: *“The hospital was far away and one had to go all the way to Homabay. So getting money for transport was at times a problem. So laziness ....at times you could assume that the child is just fine, not knowing that you are causing harm. So with me, I just became lazy. Because in Homabay, these hospitals just come recently” [Mother of 3, FGD 1].*

Participants mentioned fear of the child getting sick and other side effects as a contributor to not taking their children for vaccination: *“Some people are afraid that, once they have taken the baby for injection, the baby will become sick and will cry the whole night that she is not able to sleep. And so she will not take the baby for immunization. [Other participants agree with P1, Mother of 5, FGD 1] .”* Some even believed that by having the child immunized, the child was getting infected with the disease: *“Some say that when children are given that vaccination, they become sick. That, they are infected with a disease. [Mother of 3, FGD 2]”.*

Fear of having an HIV test conducted was a reason given by some of the caregivers for not taking their children for vaccination. The current HTS guidelines recommend that postnatal mothers are tested for HIV at 6 weeks, 6 months and 18 months postpartum: *“Currently there are some who are afraid. Because you know that now if you are to start going for clinic, for you to be enrolled, your status has to be tested. So you know this scares some people once she*

*hears that she has to be tested at the clinic. She will not go or even take the child to the clinic, because she knows that she is going to be tested. She is going to be tested for HIV, and so there are some people who are scared of knowing their HIV status and this prevents them from going to the health facilities. [Mother of 3, FGD 1] ”.*

Lastly, there were misconceptions about childhood vaccinations. Some of the participants alleged that the vaccines had components of family planning which would interfere with the number of children one would get in future: *“Some say that those drugs are for family planning and therefore when the children grow up, they will just give birth to two children each. [Mother of 2 from Marindi village]”.*

#### **4.4.1.4 Health provider factors from the Health workers perspective.**

The number of health facilities offering vaccination services in Asego Sub-County is 8. All these facilities were purposively sampled and 1 health worker from each of these facilities administered with a questionnaire. Due to the few numbers of records or questionnaires, only descriptive statistics which involved a bivariate approach of generating percentages was conducted.

It was eminent that 25% of the facilities order for their vaccine supplies, from the KEPI store in Homabay town, on a daily basis and 50% order when necessary. Upon ordering, 75% of the facilities received their vaccines within 2 hours, 12.5% received their vaccines within 6 hours and 12.5% received them immediately. The results indicated that 87.55% of the facilities have refrigerators for storing vaccines and all the facilities administer immunizations on a daily basis. When asked if they had defaulters at their respective health facilities, 3 of the 8 facilities reported not having any defaulters whereas the remaining 5 reported having defaulters at rates between 5%-20%.

When asked about adverse events following immunization (AEFI), 100% noted that they receive cases of AEFI. In the last one year, 12.5% of the facilities had received at least one case of suspected vaccine preventable diseases. The health workers were also asked about defaulters at their facilities, the level of defaulting and the defaulter tracing mechanisms they have in place. 62.5 % of the facilities have defaulters and the same proportion of facilities having defaulter tracing mechanisms in place. 60% of the facilities have defaulter rates between 11-20%. When asked about health education and health talks at the Maternal and Child Health clinic, 87.5% of the facilities educate the clients and caregivers on the

importance of immunization. This same proportion of facilities is visited by County Health Management Team members for support supervision and fault finding.

**Table 4.4.1.4:** Health provider factors from the Health workers perspective.

<b>Variable</b>	<b>Frequency</b>	<b>Percent</b>
Frequency of ordering for vaccine supply		
Daily	2	25.0%
Weekly	0	0.0%
Fortnight	2	25.0%
When necessary	4	50.0%
Delivery of supply after an order is placed		
Within 2 hours	6	75.0%
Within 6 hours	1	12.5%
Within 12 hours	0	0.0%
Within 24 hours	0	0.0%
other, specify	1	12.5%
Vaccine Storage method		
Refrigerators	7	87.5%
Other	1	12.5%
Frequency of vaccine administration		
Daily	8	100.0%
Weekly	0	0.0%
Fortnight	0	0.0%
Monthly	0	0.0%
Receive cases Adverse Events Following Immunization		
Yes	8	100.0%
No	0	0.0%
Suspected cases of vaccine preventable diseases in the last one year		
Yes	1	12.5%
No	7	87.5%
Defaulters in the facility		
Yes	5	62.5%
No	3	37.5%
Level of defaulting		
Less than 5%	0	0.0%
Between 5% - 10%	2	40.0%
Between 11% - 20%	3	60.0%
Between 21% - 30%	0	0.0%
Conduct health talks on immunization in MCH		
Yes	7	87.5%
No	1	12.5%
Defaulter tracing mechanism available at the facility		
Yes	5	62.5%
No	3	37.5%

This table indicates that vaccines are delivered when necessary, that all facilities administer vaccinations on a daily basis and also receive cases of adverse events following immunizations.

## CHAPTER FIVE

### DISCUSSION

#### **5.1. Socio demographic and economic factors influencing utilization of immunization services by caregivers of children aged less than 1 year in Asego Sub-County, Homabay County.**

Living in a community presents unique norms and believes that may affect day to day interaction of individuals within a given society. The set rules governing how things get done end up not being followed to the latter. The schedules recommended for routine immunization are prepared by the world health organization (WHO) but the most important stakeholders who determine how well the policies are executed are the caregivers of the children in the society.

Caregiver's occupation is important in the attainment of full childhood immunization. Children whose caregivers were self-employed were more advantaged compared to children whose caregivers were housewives, those not employed, employed in either government or private firms. This may be attributed to the ease of adjustable working schedules among the self-employed and also ready availability of money which enabled them to either pay for vaccination services or transport to health facilities to vaccinate their children. Another possible explanation for this could be that employed mothers may not be available during vaccination appointments as a result of their employment commitments. Previous studies conducted in China and Nigeria reflected similar results of caregivers' occupation affecting childhood immunization (Ke Han, 2014; Tagbo *et al.*, 2014). In Ethiopia, children whose mothers were farmers, taking housewives as the reference value, were 1.9 times more likely to be fully vaccinated compared to children of mothers in different occupations (Legesse, 2015).

Place of delivery influences the vaccination status of the child. This study found out that caregivers who delivered at home were 52% less likely to immunize their children compared to those who delivered at a health institution. Prior studies indicate that place of birth influenced the caregiver's utilization of vaccination services. Children born at a health facility were likely to receive all basic immunizations compared to those born at home (Jagrati, 2008). This means that children born at health facilities were likely to be brought back by the caregivers for subsequent appointment days so as to receive immunizations. During the intrapartum period, women who access services of a skilled birth attendant at the

facility are educated and reminded on the importance of honoring their clinic appointments to have their children immunized and monitored for growth and development. This intrapartum period is also the first contact between the nurse and the child during which the first two immunizations (BCG and Birth polio) are administered. A mother who delivers in a health facility is more likely to receive training from health professionals on the importance of vaccination. These findings are also in line with the results of the research by Masand *et al.* (2012), who also found out that those children born in health facilities were more likely to be fully vaccinated than children born in non-health facilities.

From this study, it was evident that increasing age remained a negative predictor for complete immunization (less utilization among children above 14 weeks). Prior studies conducted in Greece indicated that the child's increasing age remained a strong predictor for incomplete immunization. The older the child was, the lesser the chances they had of getting fully vaccinated (Joanna, 2013). At 14 weeks, children receive the last doses of pentavalent, polio and pneumococcal vaccines. The next vaccine after 14 weeks is measles at 9 months (unless the child is HIV exposed or HIV infected). This could also be attributed to the caregivers 'perception' that after the child has received majority of vaccinations by 14 weeks, he/she is older and less susceptible to diseases.

Preceding studies conducted in central Ethiopia and Mali indicated that more ANC visits were associated with completing childhood immunizations (Etana, 2012; Legesse, 2015; Koumare, 2009). Mothers who attended antenatal clinic more than 4 times were associated with a higher likelihood of their children being fully immunized compared to the counterparts who had lesser visits or did not seek prenatal care. This study reflects the findings from previous studies, which indicated higher likelihood to complete childhood immunizations among mothers who attended more than 4 ANC visits at the facilities. During the ANC visits, the importance of immunizing a child after delivery is emphasized during every visit thus upon completion of the 4 visits, the mothers understand the importance of childhood immunization and are well prepared to make the frequent visits to the health facility so as to immunize their children. ANC attendance may also be attributed to the mothers' health seeking behavior whereby mothers may discuss with health care providers on vaccine and VPDs, on importance, time of vaccine initiation, time of completion possible side effect associated with vaccine administration thus creating a good opportunity for mother to get



their children vaccinated. Health professionals also take advantage of antenatal care visits to increase awareness of proper child care by mothers.

This study identified that children who were second born were 2.47 times more likely to be immunized in comparison to those who were of higher birth order. Samad *et al.*, (2006) also identified an association between unimmunized children coming from large families and those who resided in disadvantaged or ethnic wards. The study found out that birth order was an important predictor of full immunization of the children. This is likely so because for the lower birth order children, mothers are passionate about having children and they exert appropriate care and upbringing of the children. Patra (2006) argues that caregiver's negligence might affect immunization of higher order children; he goes on to say that mothers become less interested when it comes to immunization of children of higher order. This insight calls for a scaling up of awareness for family planning in order to reduce the number of children in a household.

From this study, other socio-demographic factors evaluated were such as religion, marital status, family income, and maternal age, and they did not show any significant associations with full vaccination of children. Also unlike other studies (Ha *et al.* 2009, Nath 2007, Antai, 2009), this study could not establish a significant association between family income, maternal age and full vaccination.

However, from the FGDs conducted with the caregivers, religion was mentioned as one of the reasons for defaulting vaccination services:

*“Some people is religion. Some believe in religion, that a child is not supposed to be immunized but is to be prayed for, and no disease will attack him/her. And what will happen to you if you bring your child for vaccination and belong to that church? [Interjects, the moderator] You will be excommunicated from the church. [Mother of 2 ,FGD 2].*

Ha *et al.*, (2009), also established a strong association between religion and vaccination against measles in Zimbabwe. He found out that children whose mothers belonged to apostolic faith churches were less likely to receive measles vaccine as compared to other Christian groups. In contrast to the findings of this study; Hosseinpoor *et al.*, (2016), reported a large difference in the national DPT3 immunization coverage between the richest and poorest quintiles in Lao PDR.

This study also sought to compare vaccination of children among male and female caregivers. However, from the results, a small proportion (3.8%) were male. This therefore suggests that majority of the caregivers are female though there are no documented studies which have made such a comparison before. From literature reviews, the least studied variables concerning immunization coverage in children are paternal factors (Obinna *et al.*, 2017). Factors associated with having a fully immunized child included the woman's shared responsibility with a male caregiver about healthcare decisions for the child, compared with households in which either the woman or the man was the sole decision maker and caregiver (Shellese *et al.*, 2017).

It is important for women and their families to be educated on importance of vaccinating their children in spite of their busy work schedules. They should be encouraged to have at least 4 antenatal visits during each pregnancy and also ensure that they deliver in a health facility to increase chances of having their children receive the first two immunizations, and also so as to better understand the importance of fully vaccinating their children. Larger numbers of children in the family seem to place competing demands on mothers, while time and resources available to provide for each child become more limited. It is also important that the need for starting family planning postpartum be emphasized among women of childbearing age to reduce parity.

## **5.2 Knowledge and perceptions of the caregivers of children aged less than 1 year on immunization and vaccine preventable diseases in Asego Sub-County, Homabay County.**

In line with previous studies carried out in Ethiopia and Nigeria (Etana, 2012; Tagbo *et al.*, 2014), this study established that mothers who did not know the correct ages for commencing and completing immunizations were less likely to immunize their children than those who knew the correct ages. Knowing the correct time enables one to honor their appointments and therefore have their children receive the vaccinations as recommended by the KEPI schedule.

The participants in the FGDs were not all in a position to outline the immunization schedule and some were even unable to tell when a child completes immunization:

*“With me I see that polio is given at 3 months, and the one given at nine months, is for measles. And that's the end of immunization? We don't know the one given on the forearm.*

*And also the ones given on the thighs, the ones we come for three times, we don't know them very well. We only know the one given at nine months, which it's for measles. [Mother of 5 children, FGD 1].*

*“Up to five years! [Mother of 3, FGD 1]”.*

In concurrence with these results, in south Ethiopia, there was a significant association between the caregiver's knowledge of correct of schedule of immunization and levels of defaulting (Fikru, 2014). Vonasek *et al.*, (2016), however argues that knowledge of specific VPDs and understanding how often a child is to get vaccinated were not significantly associated with full vaccination status of the child.

Prior studies conducted in rural Uganda noted that caregivers gave reasons for not vaccinating their children such as “fearful of side effects” and “ignorance/disinterest/laziness” (Vonasek *et al.*2016). Oria *et al.*, (2011), reported that a rural population in western Kenya and an informal settlement in Nairobi most commonly stated “child was sick during vaccination period” and “parent was too busy,” respectively, as the main reason for not vaccinating their children for influenza (Oria *et al.*,2011)

The findings of this study reflect almost similar results whereby caregivers mentioned fear of side effects as a reason for not vaccinating their children:

*“Some people are afraid that, once they have taken the baby for injection, the baby will become sick and will cry the whole night that she is not able to sleep. And so she will not take the baby for immunization. [Other participants agree with P1, Mother of 5,FGD 1] ; “Some say that when children are given that vaccination, they become sick. That, they are infected with a disease. [Mother of 3,FGD 2 ]”.*

This study found out that caregivers who thought a child was not at risk of diseases if not immunized were less likely to vaccinate their children compared to those who thought otherwise. Anyaboulu (2016), agrees that caregivers who perceived their children as being at risk of disease if not immunized were likely to utilize immunization services; he concluded that perceived risk, susceptibility, and benefits were associated with full vaccination status of children.

### **5.3 Health provider factors that influence utilization of immunization services by caregivers of children aged less than 1 year in Asego Sub-County, Homabay County.**

This study identified a 28% lesser likelihood for full vaccination of children among caregivers who took between 30mins -1 hour, (with time of 15-30 minutes as the reference group) to travel to the facilities. This is line with studies in Southern Ethiopia and Sudan which revealed that respondents who took longer than 30 minutes to arrive at the health facility were more likely to default from childhood immunizations (Fikru 2014; Van den Borne *et al.*, 2007). The reason for this could be that the long travel time by the caregivers made them tired thus outweighing their perceived benefits of taking their children to the facilities for immunization. Long travel times and greater distances can lead patients not returning to the facility for their next visit. (Awoyemi *et al.*, 2016) There is however no universally accepted range of time for allowing people to travel for medical care (Antonio, 2016). In contrast to the findings of this study, Xeuatvongsa *et al.* (2017), found that travel time taken to the nearest health facility was not significantly associated with vaccination status ;his study focused on time, rather than distance, to health facilities because access depends not only on distance but also on road accessibility and on the availability of transportation

A study conducted in India to determine association between child immunization and availability of health infrastructure revealed that presence of a health center near was positively associated with immunization status of children (Kirthi, 2010). This study is in line with these findings as it found that caregivers who did not have a health facility near (~2kms) were 34% less likely to get their children fully vaccinated. It is hypothesized that a lack of health facilities near people is a major impediment to reaching health facilities and can inhibit utilization of health services (Graham *et al.*2010). It is also likely that proximity to the facilities exposes them to information and also lower transport cost.

Participants from the FGDs also mentioned distant health facilities as a reason for not vaccinating their children:

*“The hospital was far away and one had to go all the way to Homabay. So getting money for transport was at times a problem. So laziness ....at times you could assume that the child is just fine, not knowing that you are causing harm. So with me, I just became lazy. Because in Homabay, these hospitals just come recently”* [Mother of 2 , FGD 1].

Adeiga *et al.*, (2007) argues that Many of Nigeria's children were not vaccinated due to inadequate access to health facilities. In rural areas, a poor transportation system and lack of infrastructure increased the degree of isolation, particularly for those who were poor. Family caregivers living in rural areas had to travel long distances to seek treatment, compared to those in urban areas. Children who lived impoverished and hard to reach areas had the greatest difficulty getting vaccinated.

In Mathare Valley, Kenya, a study conducted to identify the factors affecting immunization coverage publicized that lateness and absenteeism of health workers which led to missed opportunities for vaccination affected coverage (Owino, 2009). This is in agreement with this study which exposed similar findings of having low immunisation coverage due to lateness of the health care workers. It is possible that caregivers arrived at the facility very early to get their children immunized but failed to return for the next visit because of lateness of the health provider.

Communication about return dates is very important as it determines whether the individual will honour their next appointment or not. From this study, caregivers who were not informed of the return dates by the health workers were 81% less likely to immunize their children in comparison to those who were informed of return dates. Parents felt that the child health card was an important vaccination information tool as it included information about when children should be vaccinated and allowed health workers to record the time and date of their next appointment (Ames, 2017). In Mozambique, three quarters of health workers said they always wrote the return dates on the child's card, but only one quarter of the cards examined actually had the date written (Sheldon, 2003) From the FGDs, there was also a gap noted in the communication from the health worker:

*“When we are issued with this book, there is nothing we are told about it. [Other participants agree...] Once you have given birth, a book is just placed on your hands and when you go back to the hospital after delivery, you are asked for it. But the doctors do not explain anything to you [Mother of 4, FGD 1]”.* Another one said, *“With me I was given the book but not told of its use. But if you read it, you will find your name and that of the baby and some educative literature inside [Mother of 2, FGD 2].”*

Only about 45% of women of reproductive age in rural Nyanza are able to read (KDHS 2008-2009) and as such, it is very important that documentation made in health records is communicated to the individual.

From the FGDs the major health care provider factors affecting childhood immunization were poor communication from the health workers, lack of vaccines at the health facilities, no prior warning about adverse events. This indicates the importance of proper commodity inventory and planning at facility, county and ultimately national level so as to ensure that there is always a buffer stock for immunizations. It is also clear that informing caregivers about benefits and adverse events of immunization goes a long way in alleviating fears, building trust between the healthcare providers and caregivers, demystifying misperceptions and misconceptions about immunizations.

Poor communication about return dates will leave the caregiver undecided about when to return for immunizations routinely. Adverse events among children do occur after immunizations and having no prior warning about them will make the caregiver hesitant to immunize his/her child. There are some religious groups and cultural practices which are against immunization services. Poverty and immunizations are linked such that caregivers can lack money for either transport or even paying for immunizations at a private facility thereby discouraging them from having their children immunized. Longer distances prevent adequate utilization of immunization services because of the long travel time to the facility. According to the ART guidelines, individuals with unknown HIV status especially women who have a child yet had not been tested antenatally or had been tested more than three months ago should have a HIV test offered to them and their child. The guidelines however allow for the individual to opt out during one visit and have the test conducted during the subsequent visit. HIV tests should be consented to unless the health provider needs results of a HIV test so as to certain of a medical diagnosis.

## **CHAPTER SIX**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **6.1. Summary of the Findings**

The most common factors contributing to low vaccination coverage are:

Socio-demographic and economic factors-Caregiver's occupation, More than 4 ANC visits, place of birth of the child, birth order and age of the child.

Knowledge and perceptions -Knowing when to start and end immunizations and perceived risk if the child was not immunized.

Health provider factors- Long travel times, lack of health facilities near homes, knowing return dates and lateness of health providers.

There is low immunization coverage in Asego Sub-County compared to the national FIC coverage. From the KDHS which was conducted around the same time with this study, it indicated that the coverage has dropped from 77% from 2008-2009 to 75% in 2013-2014.

Health education and promotion campaigns should be carried out by local authorities and non-governmental organizations to increase community alertness about importance of immunization services.

#### **6.2. Conclusion**

1. It is of great importance for women to attend antenatal clinic and thereafter deliver in the health facility to ensure that they are educated on the benefits of childhood immunization. Delivering in the health facility creates an opportunity for administration of the first two immunizations immediately after delivery. It is also during ANC visits that the caregivers are sensitized on the schedule of childhood immunization and this enables them to adhere to it. Women should be sensitized to seek maternal healthcare services during pregnancy and childbirth as a way of having a continuous relationship with health workers even after childbirth. It is recommended that family planning programs should be aimed at educating men and women in rural areas and of low educational levels of the benefits of using birth limiting methods to reduce parity.

2. It is prudent that the caregivers be informed so that they are aware of the start and stop ages for childhood immunization so as to remain retained in the EPI continuum of care. Education of risks associated with childhood VPD and importance of immunization especially through health workers increases the coverage. It is vital that the
3. Utilization of vaccination services can be enhanced by improving access and reducing travel time to health facilities by implementing outreach activities and providing supplementary immunization activities. Health workers should arrive early and always be at the clinics to explain any issues pertaining to immunization, be reminded about the importance of communicating immunization schedules and also have a functional appointment management system to prevent attrition of children receiving immunization.

### **6.3 Recommendations from this Study**

Basing on the findings of this study, the following recommendations were identified:

1. It is vital that local programmatic intervention should be strengthened to upgrade awareness of the community on the importance of immunization, antenatal care and working on advancing economic status of community is the way to optimize children's immunization coverage. So as to improve the compliance of caregivers to utilization of immunization services, health workers should encourage expectant mothers to attend all recommend ANC visits, thereafter deliver their babies at a health facility and implement strategies to reduce attrition from the immunization program by reminding them of routine appointment dates (such as calling them or sending messages).

It is further recommended that the Ministry of Health should work in partnership with Non-Governmental organization in implementation of community strategy by incentivizing community health workers thereby increasing community awareness on women empowerment, optimal ANC attendance, hospital deliveries and education on family planning.

2. To improve the consumption of immunization services, the health workers should inform the caregivers on the ages and complete immunization schedule for children. The local governments should also partner with the Ministry of health in order to



create more awareness of importance, possible outcomes or consequences of not vaccinating children and correct schedules of vaccination through information, education and communication (IEC). There is also need to invest in an electronic appointment management system which will communicate completion times of vaccinating children so as to optimize numbers of children getting fully vaccinated.

3. To improve accessibility, health facilities should have more outreach activities offered to communities which are not located near. Poor communication, religion, misperceptions about immunizations and making HIV testing compulsory should be addressed by the management committees at the facilities and ART policy makers so as to improve immunization compliance.

#### **6.4 Recommendations for future studies**

Paternal factors should be evaluated to determine male involvement in childhood immunization. Ethnographic studies should be conducted in this region so as to better understand and uncover the misconceptions, religious barriers and misperceptions affecting immunization coverage. Additional research is required to gather an in depth, qualitative knowledge on the barriers to full immunization. This will give policy makers a thorough understanding of the insights around the established factors.

## REFERENCES

- Adeiga, A., Omilabu, S. A., Audu, R. A., Sanni, F. A., Lakehinde, G. F., Balogun, O., & Olagbaju, O. (2007). *Infant immunization coverage in difficult-to-reach area of Lagos Metropolis*. *African Journal of Clinical and Experimental Microbiology*, 6, 227–231. doi:10.4314/ajcem.v6i3.7428.
- Adhikary, M., Haque, R., Tanira, S., (2013) *Determinants of child immunization under Expanded Programme of Immunization in Rural Bangladesh*. *Health Policy and Planning*. 10:3, 304-311.
- Ames H, Njang DM, Glenton C, Fretheim A, Kaufman J, Hill S, et al. (2017) *Stakeholder perceptions of communication about vaccination in two regions of Cameroon: A qualitative case study*. *PLUS ONE* 12(8): e0183721. <https://doi.org/10.1371/journal.pone.0183721>
- Amin A.A., (2005). *Social Science Research - Conception, methodology, analysis*
- Antai, D. (2009). *Faith and child survival: the role of religion in childhood immunization in Nigeria*. *Journal of Biosocial Science*, 41(01), 57-76.
- Awoyemi, T.T., Obayelu, O.A., Opaluwa, H.I., (2011). *Effect of Distance on Utilization of Health Care Services in Nigeria Rural Kogi State*, *Hum Ecol.* 35(1):1–9.
- Babirye, J.N., Rutebemberwa, E., Kiguli, J., Wamani,H., Nuwaha, F., Ingunn, E.M.S., (2011). *More support for mothers: a Qualitative study on Factors affecting Immunization Behaviour in Kampala, Uganda*. *BMC Public Health* 2011: 11(4):381-392
- Belachew, E., Wakgari, D., (2012). *Factors associated with complete immunization coverage in children aged 12–23 months in Ambo Woreda, Central Ethiopia*, *BMC Public Health* 12, pp. 566.
- Bennett S, Woods T, Liyanage WM, Smith DL.(2004) A simplified general method for cluster-sample surveys of health in developing countries.
- Biswas, S., Darda, M., & Alam, M. (2001). *Factors Affecting Childhood Immunisation in Bangladesh*. *The Pakistan Development Review*, 40(1), 57-70. Retrieved from <http://www.jstor.org/stable/41260328>

- Burton, A., (2009). *WHO and UNICEF estimates of national infant immunization coverage: methods and processes*. Geneva, Bulletin of the World Health Organization. 87: 83-89.
- Chepkemoi, L.M., Karanja, S., Kombich, J., (2013). *Immunization coverage and its determinants among children aged 12 - 23 months in a peri-urban area of Kenya*. Pan African Medical Journal 14(3).
- Egede LE & J. Gen.(2006) *Race, ethnicity, culture, and disparities in health care*. Intern Med.21(6):667–669.
- Factors Associated with Refusal of Childhood Vaccines among Parents of School-aged Children; A Case-Control Study*. Journal of American Medical Association. **159**(5): 470-476.
- Fikru, T., Alemu, T., Yemane, B., Tariku, T., (2014), *Predictors of Immunization Defaulting among Children Age 12-23 Months in Hawassa Zuria District of Southern Ethiopia*. International Journal of Public Health Science 3(3):185-193.
- Graham, J.E., Fisher, S.R., Berges, I.M., Kuo, Y.F., Ostir, G.V., (2010) *Walking Speed Threshold for Classifying Walking Independence in Hospitalized Older Adults*. Phys Ther 90(11):1591.
- Ha W, Salama P, Gwavuya S and Kanjala C (2012) *Equity and Maternal and Child Health - Is Religion the Forgotten Variable? Evidence from Zimbabwe: UNICE* .
- Halwindi, H., Siziya, S., Magnussen, P., Olsen, A., (2013). *Factors Perceived by Caretakers as Barriers to Health Care for Under-Five Children in Mazabuka District, Zambia*. ISRN Tropical Medicine 2013: 10.
- Hamilton, M., Gower, S., Rogers, S., (2004). *Why do parents choose not to immunize their children?* New Zealand Medical Journal 117(1189): 97.
- Helman, C.G., (2004). *Perceptions of Childhood Immunizations in Rural Transkei-A Qualitative Study*. South African Medical Journal 94(10): 835-838.
- Henoke, T., Amare D., and Mirkuzie W., (2009) *Predictors of defaulting from completion of child immunization in south Ethiopia, May 2008 – A case control study*. BMC Public Health 9:150
- Hosseinpoor A., Bergen N., Sholothuber A., Gacic-Dobo M., Hansen P.M., Senouci K. (2016) *State of inequality in diphtheria-tetanus-pertussis immunization*

- coverage in low-income and middle-income countries: a multi-country study of household health surveys. Lancet Glob. Health. 2016;4:e617–e626.*
- Ibnouf, A.H., Van den Borne, H.W., Maarse, J.M., (2007). *Factors influencing immunization coverage among children under five years of age in Khartoum State, Sudan. South African Family Practice 49(8): 1-7.*
- Ioanna, D., Koralia, A., Evangelia, S., George, T., Konstantinos, T., (2013). *Immunization coverage and predictive factors for complete and age-appropriate vaccination among preschoolers in Athens, Greece: a cross-sectional study. BMC Public Health 13:908.*
- Jagrati, V., Caroline, De Schacht., Ilesh, V., Gunnar, B., (2008) *Risk factors for incomplete vaccination and missed opportunity for immunization in rural Mozambique. BMC Public Health. 8: 161.*
- John,T.J., Samuel, R., (2000). *Herd immunity and herd effect: new insights and definitions. Europe Journal of Epidemiology. 16: 601-6.*
- Kamanda, B. C., (2010). *Immunization coverage and factors associated with failure to complete childhood immunization in Kawempe Division, Uganda. School of public health, University of the Western Cape: 99(6):264-273*  
Kampala. Uganda.
- Ke, H., Huizhen, Z., Zhixiong, H., Quan, Q., Hong Z., (2014). *Vaccination coverage and its determinants among migrant children in Guangdong, China. BMC Public Health. 14:203.*
- Kenya National Bureau of Statistics and ICF Macro. (2010). *Kenya Demographic and Health Survey 2008-09.* Retrieved on 22/12/2016 from <http://dhsprogram.com/pubs/pdf/fr229/fr229.pdf>.
- Kirti, G., Siddharth, A., Malavika, A., (2010). *Association between Child Immunization and Availability of Health Infrastructure in Slums in India. Pediatric and Adolescent Medical Journal. 164(3):243-249.*
- Koumaré, AK., Traore, D., Haidara, F., Sissoko, F., Traoré, I., Dramé, S., (2009) *Evaluation of immunization coverage within the expanded program on immunization in Kita Circle, Mali. A cross-sectional survey. BMC Int Health Human Rights. 9 (Suppl 1):13–9.*

- Legesse, E., Dechasa, W., (2015) *An assessment of child immunization coverage and its determinants in Sinana District, Southeast Ethiopia*. BMC Pediatrics **15**:31.
- Maina LC, Karanja S, Kombich J. Immunization coverage and its determinants among children aged 12–23 months in a peri-urban area of Kenya. The Pan African medical journal. 2013;**14**:3.
- Masand R, Dixit AM, Gupta RK(2012): *Study of immunisation status of rural children (12-23 months age) of district Jaipur; Rajasthan and factors influencing it: a hospital based study*, Journal of Indian Med Assoc. 2012 Nov;110(11):795-9.
- Milligan Paul, Alpha Njie, Steve Bennett(2004) Comparison of two cluster sampling methods for health surveys in developing countries, *International Journal of Epidemiology*, Volume 33, Issue 3, 1 June 2004, Pages 469–476, <https://doi.org/10.1093/ije/dyh096>
- Mukungwa T.(2015) *Factors Associated with full Immunization Coverage amongst children aged 12 – 23 months in Zimbabwe; Zimbabwe Open University Faculty of Applied Social Sciences Chiedza House, Kwame Khuruma Ave Harare, Zimbabwe*.
- Nath B (2007) *A study on determinants of immunization coverage among 12-23 months old children in urban slums of Lucknow district; India*, India Journal of Medical Science Volume : 61, Issue : 11, Page : 598-606.
- Nicola W., Year A., Sender P., Campbell F., Legido H.,Howard N.(2016) *Provider and service-user perspectives of Volunteer health-worker service provision in Ayeyarwady Region, Myanmar: a qualitative study*. British Medical Journal 6(12).
- Obinna O., Vibha K., Adebowale A., Simon D.,(2017) *Individual and socioeconomic factors associated with childhood immunization coverage in Nigeria*.The Pan African Medical Journal ,**26**:220.
- Olumuyiwa, O.O., Francois, P., Meurice, P.F., Ahonkhai, V., (2008). "*Determinants of vaccination coverage in rural Nigeria*. BMC Public Health **8**: 381.
- Omutanyi, R.M., (2005). *Determinants of immunization coverage in Butere-Mumias district, Kenya*. East Africa Medical Journal **10**: 501- 505.

- Oria PA, Arunga G, Lebo E, Wong JM, Emukule G, Muthoka P, et al (2013). *Assessing parents' knowledge and attitudes towards seasonal influenza vaccination of children before and after a seasonal influenza vaccination effectiveness study in low-income urban and rural Kenya, 2010–2011*. BMC Public Health. 2013; 13:391. doi: 10.1186/1471-2458-13-391
- Owino, L.O., Olenja, G.J., Meme, J.S., (2009) *Factors Influencing Immunization Coverage in Mathare Valley, Nairobi.. East African Medical Journal* **86**(7): 7.
- Patra N(2006) *Universal Immunization Programme in India: The Determinants of Childhood Immunisation*, presented at the 42nd Annual Conference . The Indian Econometric Society (TIES), held at GND Univ., Amritsar, India. <http://ssrn.com/abstract=881224>
- Paul Fine Ken Eames David L. Heymann (2011) *Clinical Infectious Diseases*, Volume 52, Issue 7, 1 April 2011, Pages 911–6, <https://doi.org/10.1093/cid/cir007>.
- Ruhul A., Telma J., Corte R., Mateus C., Tanya B., Michael F., Kelli C.,(2013) *Factors limiting immunization coverage in urban Dili, Timor-Leste*. Glob Health Science Practice. **1**(3): 417–427.
- Salmon, D.A.P., Moulton, L.H., Saad, B. O., Shannon, P.M., Stocksley, N. A., (2005)
- Samad, L., Tate, A. R., Dezateux, C., Peckham, C., Butler, N., & Bedford, H. (2006). *Differences in risk factors for partial and no immunization in the first year of life: prospective cohort study*. *BMJ: British Medical Journal*, 332(7553), 1312–1313.
- Sharma, V., Singh, A. & Sharma, V., (2015) *Provider's and User's Perspective about Immunization Coverage among Migratory and Non-migratory Population in Slums and Construction Sites of Chandigarh*. *Journal of Urban Health* 92(2): 304-312.
- Sheldon SJ. Alons C. (2003) *A study to describe barriers to Childhood Vaccination in Mozambique, Final Report*. Maputo, Mozambique: Ministry of Health, Expanded Program on Immunization; Mozambique: Change Project and Project Hope.

Shellese A. Shemwell, Meridith B. Peratikos, Lazaro Gonzalez-Calvo, Montse Renom-Llonch, Alexandre Boon, Samuel Martinho, Chalotte B. Cherry, Ann F. Green, Troy D. Moon; (2017) *Determinant of Full Vaccination Status in Children Aged 12-23 Months in Gurue and Milange Districts, Mozambique: Results of Population-Based cross-sectional survey*, International Health, Volume 9, Issue 4, July, 2017, Pages 234-242

UNDP (2016) *Sustainable Development Goals*.

UNDP (2016) *The Millennium Development Goals Report 2015*.

United Nations Department of Economic and Social Affairs. (2015). *Transforming our world: The 2030 agenda for sustainable development*. Retrieved from <https://sustainabledevelopment.un.org/post2015/transformingourworld>.

Vonasek BJ, Bajunirwe F, Jacobson LE, Twesigye L, Dahm J, Grant MJ, et al. (2016) *Do Maternal Knowledge and Attitudes towards Childhood Immunizations in Rural Uganda Correlate with Complete Childhood Vaccination?* PLoS ONE 11(2): e0150131. doi:10.1371/journal.pone.0150131

WHO (1991). *The EPI Coverage Survey*.

WHO (2009) "*WHO and UNICEF estimates of national infant immunization coverage: methods and processes*." 87: 535-541.

WHO (2013) *Immunizations, vaccines and biological*.

WHO (2015) *Kenya launches Polio Round Two in Migori County*.

WHO, UNICEF, World Bank (2009) *State of the world's vaccines and immunization*, 3rd ed. Geneva, World Health Organization.

WHO, UNICEF, World Bank, (2009). *State of the world's vaccines and Immunization*.

Xeuatvongsa, A., Hachiya, M., Miyano, S., Mizoue, T., & Kitamura, T. (2017). *Determination of factors affecting the vaccination status of children aged 12–35 months in Lao People's Democratic Republic*. *Heliyon*, 3(3), e00265. <http://doi.org/10.1016/j.heliyon.2017.e00265>.

## APPENDICES

### Appendix I: Consent Form

Dear respondent,

You have been selected to participate in this study: *“Factors Influencing Utilization of Immunization Services by Caregivers of Children aged less than one year in Asego Division, Homabay District”*. Participation is entirely voluntarily; you have the right to withdraw from the study at any time without being penalized. However, there will be no compensation for your participation in this study. Findings of this study will be used by the Ministry of Health in identifying the factors contributing to low immunization coverage and hence aid in developing strategies to improve on the same. I kindly request you to honestly respond to the questionnaire given to help me achieve the objectives of this study. If you have any questions regarding your participation in this study kindly contact the Principal Investigator-Iris Wanga on 0722 847 223 ;if you have any questions about the study, kindly contact Ethics Review Committee on +254 057 351 221.All information you give will be treated with confidentiality and only used for academic purposes. If you accept to participate, kindly sign below.

Signature.....Date.....

**Thank you.**

\*\*\*\*\*

Mogen Jachiwre,

Oyieri mondo ibed e nonro mar Somoni: *“Gik ma siro kata thiro tich kod kony mag chanjo ne jonyuol mag nyithindo mapok oromo higa achiel e Asego Divisen, Homabay District”*. Bedo mari en kuom chiwruok ni; in gi ratiro mar wuok e nonro e saa asaya maonge kum. Kata kamano, onge chudo ma ibiro miyi ne bedo ni e nonro ni. Dwoko mag nonro ni ibiro ti godo gi Migao mar Thieth e fwenyo gik ma miyo tiyo kod kony mag chanjo ni piny kendo konyo e loso okenge ma inyalo keti, mondo gibed maber. Akwayi mondo idwok andike mar penjo e yo ma ratiro mondo okonya achop e lengo mar nonro ni. Ka in kod penjo more moluwo bedoni e nonro mar somo ni, to wakwayi ni igoch ne Jannro Maduong –Iris Wanga e namba sime 0722 847 223 kata igochne Jokamitii mag weche nonro mopandi e namba sime +254 057 351 221. Weche duto ma ichiwo ibiro ket maling’ling’ kendo ibiro ti godo e yor somo kende. Ka iyie bet a nonro, yie iket seyi piny kanyo.

(Those unable to sign can place a thumbprint instead)

Seyi/ Alama mar lith Lwedo Mathuon .....Tarik.....

**Ero kamano.**



## Appendix II: Questionnaire for Caregivers in English

Kindly answer with a tick (  ) in the answer box

NB: *Ignore immunizations given during campaigns*

**CLUSTER NUMBER:** \_\_\_\_\_

**CHILD NUMBER IN CLUSTER:** \_\_\_\_\_

**IMMUNIZATION BOOKLET: a. YES** [  ] **B.NO** [  ]

**FIC: a. YES** [  ] **b. NO** [  ]

**GENDER OF CAREGIVER:** \_\_\_\_\_

**AGE OF CAREGIVER:** \_\_\_\_\_

### A. Socio- Cultural and Economic Factors

1. Child birth date

Day \_\_\_\_\_ month \_\_\_\_\_ year \_\_\_\_\_ Or Age of child in months \_\_\_\_\_

2. Sex of the child 1= male [  ] 2= female [  ]

3 . How many children do you have? \_\_\_\_\_

4. Have you lost any child before?

If yes, how many \_\_\_\_\_ what was the cause of death? \_\_\_\_\_

5. What is your relationship with the child?

a=parent [  ] b=grandparent [  ] c=guardian [  ]

If guardian/other, \_\_\_\_\_ state why \_\_\_\_\_

6. What is your marital status?

a= single [  ] b= married [  ] c= separated [  ] d= divorced [  ] e= widowed [  ]

7. What is your highest level of formal education?

a=illiterate [  ] b=read and write [  ] c= std.1-8 [  ] d= form 1-4 [  ]

e=college/university [  ]

f=other, specify\_\_\_\_\_

8. What do you do to earn your daily food?

a= House wife [ ]

b=employed [ ] (i) government [ ] (ii).private [ ]

c=self-employed [ ]

d= others, specify\_\_\_\_\_

9. What is your family monthly income per month? \_\_\_\_\_

10. Are you religious? a=yes [ ] b=no [ ]

What is your religion?

a=Adventist [ ] b= protestant [ ] c=catholic [ ] d= Muslim [ ]

e= other specify\_\_\_\_\_

11. Did you attend antenatal care during your last pregnancy?

a= Yes [ ] b= No [ ]

12. If yes, how many times did you attend? \_\_\_\_\_

13. Where did you deliver your last baby?

a= at home [ ] b= at health institution [ ]

c=other\_\_\_\_\_

## **B. Knowledge of Caregivers on Immunizations and Vaccine Preventable Diseases.**

14. Have you heard about vaccination and vaccine preventable disease?

a=Yes [ ] b=No [ ]

15. If yes to above question, from where did you hear about the vaccination and vaccine preventable disease?

a=Radio [ ] b=television [ ] c=friends [ ] d=health worker [ ]  
e=other, specify \_\_\_\_\_

16. What is the importance of immunizing a child?

a=to prevent the disease [ ] b= to treat specific disease [ ]

c=other, specify \_\_\_\_\_

17. Tell me which of the following diseases can be prevented by vaccination.

a. Measles [ ] f. Polio [ ]

b. Tetanus [ ] g. Hepatitis b [ ]

c. Pertusis [ ] h. Haemophilus influenza b [ ]

d. Tuberculosis [ ] i. Pneumonia [ ]

e. Diphtheria [ ]

18. Which are some of the symptoms of vaccine preventable diseases?

a=rash [ ] b=fever [ ] c=diarrhea [ ] d. sore throat [ ]

e=runny nose [ ] f=red teary eyes [ ] g=other, specify \_\_\_\_\_

19. Is a child at risk of diseases if he /she doesn't receive immunizations?

a=yes [ ] b=no [ ] c=other, specify \_\_\_\_\_

20. Do you think vaccines are safe when they are being administered to the child?

a= yes [ ] b=no [ ] c=other, specify \_\_\_\_\_

21. Are vaccines effective in preventing diseases in children?

a= yes [ ] b=no [ ] c=other, specify \_\_\_\_\_

22. Did the health worker educate you on the importance of completing childhood immunizations?

a= yes [ ] b=no [ ] c=other, specify \_\_\_\_\_

23. Did the health worker inform you on the return date?

a= yes [  ]                      b=no                      [  ]                      c=other, specify \_\_\_\_\_

24. At what age does a child begin immunization?

a= just after birth                      [  ]

b= one month after a birth                      [  ]

c=any time                      [  ]

d=after one year                      [  ]

e=other specify \_\_\_\_\_

25. At what age should the child complete immunization? \_\_\_\_\_

26. Do you think immunization will make your child sick? \_\_\_\_\_

### C. Health Provider Factors

27. Is there any health facility which offers immunization services near you (~2kms)?

a=Yes [  ]    b=No [  ]

28. If yes, which health facility is near to you?

a. health center                      [  ]

b. hospital                      [  ]

c. dispensary                      [  ]

d. private clinic                      [  ]

29. How long does it take you to reach there in minutes?

a. Less than 15 minutes                      [  ]

b. 15-30 minutes                      [  ]

c. 30 min-1hour                      [  ]

d. > 1 hour                      [  ]

e. other, specify \_\_\_\_\_



**To be completed by the research assistant.**

34. Copy the immunization data from the immunization booklet.

*(Transfer the immunization history from the booklet, to the table below)*

Vaccine administered	Date	Month	Year	Return date given
BCG				
OPV 0				
OPV 1				
OPV 2				
OPV 3				
Pentavalent 1				
Pentavalent 2				
Pentavalent 3				
Pneumococcal 1				
Pneumococcal 2				
Pneumococcal 3				
Measles				

35. Does the child have a BCG scare on his/her left forearm? Observe Yes \_\_\_\_ No \_\_\_\_

If the child has no scar, ask the following:

36. What are the reasons for not receiving vaccines? [ ]

a. Absence of health facility in the locality [ ]

e. Religion and culture refute vaccination [ ]

f. Lack of awareness about vaccination [ ]

g. Fear of side effects [ ]

h. Others, specify \_\_\_\_\_

### Appendix III: Questionnaire for Health Facility Administrators-English

Below is a list of questions, kindly tick against the most appropriate answer

1).What childhood immunization vaccines are normally available in this facility?

2).How often do you order for your supply of vaccines

a=Daily [ ] b= weekly [ ] c=fortnight [ ] d=when necessary [ ]

e=other, specify\_\_\_\_\_

3) How soon are the vaccine supplies delivered after an order is placed?

a=2 hours [ ] b= 6 hours [ ] c=12 hours [ ] d= 24 hours [ ]

e=other, specify\_\_\_\_\_

4) How do you store your vaccines? (*Check for storage facility*)

a=Refrigerators [ ] b=other, specify\_\_\_\_\_

5).Do you have a back-up power supply?

a=yes [ ] b=no [ ] If yes, specify \_\_\_\_\_

6).How often do you administer vaccines

a=Daily [ ] b= weekly [ ] c=fortnight [ ] d= monthly [ ]

7).Do you receive cases for Adverse Events Following Immunization?

a= Yes [ ] b=No [ ] If yes, which antigens\_\_\_\_\_

8) Enlisted below are the possible reasons for ineffective immunization. Kindly arrange them in order of priority starting with the most significant (with 1 being most significant and 7 being least significant)

a=Staff shortage. [ ]

b=Long distance to facility [ ]

c=Lack of vaccines at the facility [ ]

d=Lateness and absenteeism, [ ]

e=Fear of Adverse Events Following Immunization [ ]

f=Lack of knowledge on immunizations and vaccine preventable diseases [ ]

g=Rude nurses.

[ ]

9) Are there any suspected cases of vaccine preventable diseases that have been reported at your facility in the past one year?

a=Yes [ ]      b= No [ ]

If yes, how many\_\_\_\_\_

Which vaccine preventable diseases? \_\_\_\_\_

10) Are there defaulters in your facility?

a=Yes [ ]      b= No [ ]

If yes, what is the level of defaulting?

a=<5% [ ]      b=5-10% [ ]      c=11-20% [ ]

d=21-30% [ ]      e=other, specify\_\_\_\_\_

11).Do you conduct outreach services?

a=Yes [ ]      b= No [ ]

If yes, how often, specify\_\_\_\_\_

12) Do you conduct Continuous Professional Development for staff in this facility?

a=Yes [ ]      b= No [ ]

If yes, how often, specify\_\_\_\_\_

13).Do you conduct health talks on immunizations for the clients at the MCH?

2      A= Yes, [ ]      b=No [ ] .

If yes, how often, specify

**Write a Short Response**

14).How do you manage immunization defaulters in your facility?

\_\_\_\_\_



15). Are there any defaulter tracing mechanisms in place?

a=Yes [ ] b=No [ ]

If yes, specify \_\_\_\_\_

16).Do you have immunization coverage targets at this facility?

a=Yes [ ] b=No [ ] If yes, what is the target set? \_\_\_\_\_

17).Do the CHMT members ever visit your facility? a=Yes [ ] b=No [ ]

If yes, how often \_\_\_\_\_;

What is the agenda of their visit? \_\_\_\_\_

18) In your own opinion, what do you think is the cause of low immunization coverage in this region? \_\_\_\_\_

\_\_\_\_\_

## **Appendix IV: FGD Guide for Caregivers -English**

### **I.INTRODUCTION**

*Good morning/ afternoon, and thank you all for coming. My name is \_\_\_\_\_ and this is my colleague \_\_\_\_\_. We are working with a Research Study. We are conducting several meetings with people like you to find out how you feel about several health issues concerning children. We will be talking to groups of women with children less than 1 year. Your opinions are very important, and they will help us improve the kind of services that are provided. Please tell us your feelings and ideas about the topics that come up in today's talk.*

*There are no right or wrong answers, and you do not have to agree with what someone else says. Everyone's contribution is valuable. We want this to be a group discussion; so don't wait for me to call on you. Just speak up. Speak up one at a time so we all can hear.*

*Your answers will remain confidential and anonymous. Your answers will help us plan programs for your area. We will not mention names in this session but will use numbers which will be assigned to us prior to the discussion. This discussion will take about 1-1.5 hours.*

*So that we do not lose any important information, we would like to tape-record the discussion. Is that all right with everyone? You may listen to the discussion at the end if you wish.*

### **II. INTRODUCTION EXERCISE**

Conduct introductions- Request each participant to take a few minutes to talk with the person on her left. She should find out all they can about that person—where she lives, how she spends his time in the village and what her interests are. Give participants 2 minutes to talk with their neighbours. Then ask each participant to introduce her neighbour to the group.

### **III. WARM-UP**

Assign numbers and remind participants that there is no mention of names. Distribute refreshments at this time.

## FGD GUIDE

### A. KNOWLEDGE, ATTITUDE & BELIEFS ABOUT IMMUNISATION.

1. Have you heard about immunization? What do you think about it?  
Probe:
  - a. *What local name is given to immunization in this community?*
  - b. *Name the diseases against which children are immunized?*
  - c. *What are the local names for these diseases?*
  - d. *Are these diseases a problem for children in this community?*
  - e. *In your opinion, are these diseases dangerous to children in this community? Why?*
  
2. How many times should a child be immunized during his/her first year of life?  
Probe:
  - a. *Describe how immunization is given each time (first to last)*
  - b. *What do you think the child gets each time and how many doses does a child get?*
  - c. *By what age should a child have completed all the immunization doses?*
  
3. Do you know any parent or caregiver in this community who did not take her/his child for immunizations? Probe:
  - a. *What kind of people were they? (Probe for educational and marital status, age, religion, occupation, others)*
  - b. *Why do you think they did not?*
  - c. *How can we convince them to take their children to complete the immunization schedule? Who will be the best person to convince them?*
  
4. Do you know of any side effects to the child that might result from immunization?  
Probe:
  - a) *Have you experienced, seen or heard about any child who had a side effect from immunization? What did the child have?*
  - b) *What did you do about the side effect?*
  - c) *Did the service provider tell you/caretaker in advance that some children might have some side effects? What did she tell you/caretaker about side effects?*
  - d) *Did the service provider tell you/caretaker what to do if your child gets a side effect from immunization? (If 'yes', ask: Did you understand the service provider's advice? Did you follow her advice – why/why not?)*
  - e) *Do caretakers have the opportunity to ask questions to health workers? Why/Why not?*
  
5. In this community, what are your sources of information about immunization?  
Probe:
  - a) *Who tells you about routine immunization?*

6. Of those that you have mentioned, what sources of information on immunization do you think caretakers trust most? What about you?

Probe:

- (a) *What kind of person would best convince caretakers in this community to take their children for routine immunization in order to complete their children's immunization schedule?*
- (b) *What sources of information do you prefer?*

7. Have you heard of someone in this community talking against taking children for immunization?

Probe: *What have you heard?*

- (a) *Do you yourself think some people in the community believed them? Why do you think they believed them?*
- (b) *Do you think what they said was true or false? Why?*
- (c) *How can we convince caretakers that immunization is good for protecting a child against diseases?*
- (d) *Who in the community can best convince caretakers?*
- (e) *In your opinion, what key messages must caretakers know in order to be convinced to take their children regularly for routine immunization?*

8. Do you/caretakers in this community have child health booklets?

- a) *Who gave them to you?*
- b) *What were you told about the booklets?*
- c) *Did you understand what you are supposed to do with the booklet?*

## **B. HEALTH PROVIDERS AND IMMUNISATION SERVICES**

9. In this community, where do caretakers take their children for routine immunization? Is it far? Is it near? Is it in a health facility?

10. When is this facility open? Day? Time? Is it regular/irregular?

11. What do you like about the immunization services offered to you? Probe:

- (a) *The service providers?*
- (b) *The equipment?*
- (c) *The health facility environment*
- (d) *Days and time of immunization?*
- (e) *(Others): What else? ...*

12. What do you not like/What needs to be improved? Probe:

- a. *The service providers?*
- b. *The equipment?*
- c. *The health facility environment*
- d. *Days and time of immunization?*
- e. *(Others): What else? ...*

13. How do caretakers get information that the facility will be open? Who tells them? Are there times when you go there for immunization and the facility is not open/working? Which times?
14. In your opinion, do health providers advise caretakers about the possible side effects of immunization?  
Probe:
  - a) *Do the service providers ascertain that mothers actually do understand the advice given?*
  - b) *What should service providers do to encourage mothers to ask questions if they do not understand health advice?*
  - c) *What do you think service providers should do to maintain a good relationship with caregivers? What should caregivers do to maintain a good relationship with service providers?*
  - d) *Do service providers give return dates for immunizations? What can service providers do to help caretakers remember the date and time for the next immunization?*

### **C. SOCIAL FACTORS**

15. Do family members encourage or support caretakers to take their children for immunization? If 'yes',
  - a) *What kind of support do they give? (Probe: Encouragement, Transport, Reminders, others ...)*
  - b) *If 'no', why do you think they do not support caregivers?*
16. In what situation do you ask for permission to take your child for immunization? From who?
17. Are there cultures/religions in this community which refute immunizations? What do they say about immunizations?
18. In your opinion, what contribution can fathers make towards successful routine immunization?
19. Which challenges do you experience when bringing your child for immunization?

### **V. WRAP-UP**

*Wrap up the discussion:  
This has been a very interesting discussion....  
End by saying:*

#### **Is there anything else you'd like to mention to me or to the group?**

Ask more than one respondent in different ways. Then be sure to correct any blatant, dangerous misconceptions and ask the group if they have any questions about the facts.

## **Appendix V: FGD Guide For Caregivers -Dholuo**

### **I. INTRODUCTION**

*Oyawre / osawre, kendo ero kamano uduto kuom biro. Nyinga en \_\_\_\_\_to ma en jal ma watiyo go \_\_\_\_\_. Watiyo e nonro. Wabedo gi romo mathoth kod ji kaka un mondo wang'e kaka uneno kuom thoth weche mag ngima motudore kod nyithindo. Wabiro wuoyo gi grube mag mine man gi nyithindo ma hik gi tin ne higa achiel. Pachu duong ahinya ne wan , kendo gibiro konyowa e keto maber kit kony ma ichiwo. Yie inyiswa kaka uneno kendo pachu kuom weche ma dhi bedo e twak ma kawuono.*

*Onge dwoko ma kare kata ma ok ni kare, kendo ok ochuno ni nyaka iyie kod gima ng'at machielo wacho. Wach ma wuok kuom ng'ato ka ng'ato ber ne wan. Wadwaro ni ma obed twak ma kanyakla; koro kik irit mondo aluongi. Wuo awuoya. Uwuo awuoya nga'to achiel e thulo ka thuolo mondo waduto wawinj.*

*Dwoko u duto ibiro ket maling'ling' kendo biro bedo ma onge nying. Dwoko u biro konyowa chenro e aluora u. Ok wabi luongo nying e thuolo ni makmana ni wabiro tiyo kod namba ma ibiro chiw kapok wadhi e twak. Twak ni biro kawo kind saa 1-1.5.*

*Mondo kik wawit weche ma nyalo konyo, dwaaher mondo wamak twak e nyakalondo . Bende uduto uyie gi mano? Unyalo winjo twak no ka watieko ka uhero.*

### **II. INTRODUCTION EXERCISE**

Conduct introductions- Request each participant to take a few minutes to talk with the person on her left. She should find out all they can about that person—where she lives, how she spends his time in the village and what her interests are. Give participants 2 minutes to talk with their neighbours. Then ask each participant to introduce her neighbour to the group.

### **III. WARM-UP**

Assign numbers and remind participants that there is no mention of names. Distribute refreshments at this time.

## FGD GUIDE

### A. KNOWLEDGE, ATTITUDE & BELIEFS ABOUT IMMUNISATION.

20. Bende isewinjo wach kuom chanjo? Gin ang'o ma iparo kuome?

Probe:

- a. *En nying maner ma umiyo chanjoe oganda ni?*
- b. *Nyisa uru nying tuoche ma imiyo nyithindo chanjo mondo ogeng'?*
- c. *Gin nyinge mage ma uluongo godo tuoche gi ka?*
- d. *Bende tuoche gi chando nyithindo e oganda ni?*
- e. *Kaluwore gi pachu, bende tuoche gi hinyo nyithindo e oganda ni? Nang'o?*

21. Nyathi onego oyud chanjo nyadidi e hike mokwongo mar ngima ?

Probe:

- a. *Nyisa kaka chanjo ichiwo e thuolo ka thuolo (ka uchako gi mokwongo nyaka mogik)*
- b. *Gin ang'o ma uparo ni nyathi yudo e kinde ka kinde kendo gin dos adi ma nyathi yudo?*
- c. *En higa mane ma nyathi onego obed ni otieko dos mag chanjo duto tee?*

22. Bende ung'eyo janyuol kata jarit nyathi e oganda ni mane ok oter nyathine ne chanjo ?

Probe:

- a. *Gin ji aina mage? (Probe for educational and marital status, age, religion, occupation, others)*
- b. *Ang'o ma omiyo uparo ni ne ok gitero gi?*
- c. *Ere kaka wanyalo hoyo gi mondo giter nyithindgi mondo otiek chenro mar gi mar chanjo? En ng'ano ma nyalo bedo ng'ama ber mogik ma nyalo hoyo gi?*

23. Bende ung'eyo rach moro ma thenge ne nyathi ma nyalo wuok kuom chanjo?

Probe:

- a. *Bende iseneno kata winjo wach kuom nyathi mane obedo gi rach mowuok kuom chanjo? Ang'o ma ne otimo nyathino?*
- b. *Gin ang'o mane utimo kuom rach ma thenge no?*
- c. *Bende jachiw kony ne onyisi/jarit nyathichon ni nyithindo moko nyalo bedo gi rach mamoko ma thenge ? Gin ang'o mane onyisi/jarit nyathi kuom rach mathenge ?*
- d. *Bende jachiw kony ne onyisi/jarit nyathi gima inyalo timo ka nyathini oyudo rach ma thenge ma kowuok kuom chanjo? (If 'yes', ask: Bende ne iwinjo wach mane ne jachiw kony no ne onyisi? Bende ne iluwo wach mane onyis – nang'o ne iluwo/ne ok iluwo?)*
- e. *Bende jorit nyithindo bedo gi thuolo mar penjojotij thieth penjo? Nang'o/nang'o ok gibed gi thuolo mar penjo?*

24. E oganda ni, iyudo weche kuom chanjo ka oa e yore mage?

Probe:

- a. *En ng'ano ma nyiso u wach kuom chanjo ma pile?*

25. Kuom yore ma uwacho gi , gi yore mage mauyudo e weche kuom chanjo ma uparo ni jorit nyithindo ogeno ahinya? To un?

Probe:

- a. *En ng'ato aina mane ma nyalo hoyo ahinya jorit nyithindo e oganda ni mondo oter nyithindgi ne chanjo ma pile mondo gitek chenro mar chanjo mar nyithindgi?*
- b. *Gin yore mage mag yudo wach ma inyalo hero?*

26. Bende isewinjo ng'ato ka wuoyo marach kuom tero nyithindo e chanjo?

Probe:

- a. *Gin ang'o ma isewinjo?*
- b. *Bende in iwuon iparo ji moko e oganda ne obedo gi yie kuom wach gi? Ang'o ma omiyo uparo ni ne giyie kuom gi?*
- c. *Bende iparo ni gik mane giwacho ne gin adiera koso miriambo? Nang'o?*
- d. *Ere kaka wanyao hoyo jorit nyithindo ni chanjo ber e geng'o tuoche ne nyathi ?*
- e. *En ng'a e oganda ma nyalo hoyo jorit mag nyithindo gi maber mogik?*
- f. *Kaluwore gi pachu, gin weche mage ma jorit nyithondo nyaka ng'e mondo oho gi mondo giter nyithindgi ne chanjo ma ichiwo mapile kaka dwarore?*

27. Bende un /jorit nyithindo e oganda ni nigi buge mag ng'iyo kaka ngima nyathi en?

- a. *En ng'ano mane omiyo u gi?*
- b. *Gin ang'o mane onyisu kuom buge go?*
- c. *Bende ing'eyo gima onego itim kod bug no?*

## **B. HEALTH PROVIDERS AND IMMUNISATION SERVICES**

28. E oganda ni, ere kama jorit nyithindo tero gi ne chanjo ma pile ? Obor? Ochiegni? Bende en kar thieth?

29. Kar thieth ni oyaw e thuolo mane? Odiochieng'? Saa? En mapile /ma ok yaw pile?

30. Gin ang'o ma iher kuom kony mag chanjo ma ne omiyo? Probe:

- a. *Jochiw kony go?*
- b. *Gik tich?*
- c. *Aluora mar kar thieth*
- d. *Odiochienge kod saa mar chanjo?*
- e. *(Others): Gimoro machielo? ...*

31. Gin ang'o ma ok ihero /Ma onego oket maber? Probe:

- (a) *Jochiw kony go?*
- (b) *Gik tich?*
- (c) *Aluora mar kar thieth*
- (d) *Odiochienge kod saa mag chanjo?*
- (e) *(Others): Gimoro machielo? ...*

32. Ere kaka jorit nyithindo yudo weche ne kar thieth biro bedo ka oyaw? En ng'ano am nyiso gi? Bende nitie seche ma idhi kanyo ne chanjo to kar thieth no ok oyaw/ ok ti ? Seche mage?



33. Kaluwore gi pachi, bende jochiw thieth nyiso jorit nyithindo kuom rach ma thenge ma nyalo bedo mag chanjo?

Probe:

- a. *Bende jochiw kony gi ng'iyoga ka bende mine owinjo wach ma ginyiso gi?*
- b. *Gin ang'o ma jochiw kony onego otim mondo gijiw mine mondo openj penjo ka ok giwinjo puonj kuom thieth ma omi gi?*
- c. *Gin ang'o a uparo ni jochiw kony gi onego otim mondo gibed kod winjruok maber e kind gi kod jorit nyithindo? Gin ang'o ma jorit nyithindo onego otim mondo gibed kod winjruok maber kod jochiw kony?*
- d. *Bende jochiw kony chiwo ga tarik mar duogo e chanjo? Gin ang'o ma jochiw kony nyalo timo mondo gikony jorit nyithindo opar tarik kod saa mar chanjo mabiro?*

### **C. SOCIAL FACTORS**

34. Bende jo familia kata anyuola jiwo kata siro jorit nyithindo mondo oter nyithindgi ne chanjo Ka 'ee',

c) *Gisiro gi e yo mane? (Probe: Jiwo gi, Yor wuoth, Paro ne gi, mamoko ...)*

d) *Ka 'Ooyo', uparo ni ang'o ma omiyo ok gisir jorit nyithindo?*

35. Gin thuolo mage ma ikwayo thuolo mondo iter nyathini ne chanjo? Kowuok kuom ng'a?

36. Bende nitie chike /dinde e oganda ni ma pingo chanjo? Gin ang'o ma giwacho kuom chanjo?

37. Kaluwore gi pachi, en kony mane ma wuone nyithindo nyalo chiwo e keto chanjo ma pile mondo odhi maber?

38. Gin pek mage ma iyudo ka ikelo nyathini ne chanjo?

### **V. WRAP-UP**

*Wrap up the discussion:*

*Ma osebedo twak maber ahinya....*

*End by saying:*

### **Bende nitie gimoro machielo ma duher wacho na kata ne kanyakla?**

Ask more than one respondent in different ways. Then be sure to correct any blatant, dangerous misconceptions and ask the group if they have any questions about the facts

### Appendix VI: Work Plan

Publishing									
Thesis submission, marking and defense									
Report Writing									
Data cleaning and Analysis									
Data collection									
Training of interviewers									
Questionnaire Development & piloting of the study									
Submission and approval of Proposal by IRB									
Departmental presentation.									
Proposal Writing									
Research Development									
	March 2013 to Sept. 2013	Jan. 2014	March 2014 to Sept. 2014	Oct.2014 to Dec. 2014	Jan.2015 to May 2015	May2015 to June 2017	Aug.2017 to Oct. 2018	Nov. 2018	

## Appendix VII: Research Budget

Items	Quantity	Cost/Unit	Total
Stationery			
Printing paper	6 rims	600	3600
Folders	6	300	1800
Felt pens	5	200	1000
Flip chart	10	50	500
Flip chart board	1	1000	1000
Pens	1 box	100	200
<b>Sub total</b>			<b>8000</b>
Printing charges for draft data collection tools and proposal	1000 pages	6/page	6000
Piloting of data collection tools at health facilities- lunch and transport for community health workers	3 health facilities	2300/facility	6900
Full day conference rates during training of community health workers and interviewers on data collection tools	6 pax	2500/person	15000
Printing charges during data collection.-FGD guides ,Questionnaires and consent forms	3500 pages	6 shs./page	21000
<b>Sub total</b>			<b>49000</b>
<b>Equipment</b>			
Digital Audio recorder	1	15000	15000
USB Flash Drive	1	2000	2000
A4 Batteries for digital recorder	2 pairs	250	500
<b>Sub total</b>			<b>17,500</b>
<b>Documentation and publication costs</b>			
Data analysis and thesis production-Analysis of qualitative and quantitative data		67,500	67,500
Dissemination and publication of findings-Maseno School of graduate studies, MOH and NACOSTI.		10,000	10,000
<b>Sub total</b>			<b>77,500</b>
Daily travel of research assistants	5 people for 6 days	500/day	15000
<b>Subtotal</b>			<b>15000</b>
<b>GRAND TOTAL</b>			<b>167,000</b>

## Appendix VII: MUERC Approval Letter



### MASENO UNIVERSITY ETHICS REVIEW COMMITTEE

Tel: +254 057 351 622 Ext: 3050  
Fax: +254 057 351 221

Private Bag – 40105, Maseno, Kenya  
Email: muerc-secretariate@maseno.ac.ke

**FROM:** Secretary - MUERC

**DATE:** 21<sup>st</sup> November, 2014

**TO:** Iris Weku Wanga  
PG/MPH/0013/2012  
Department of Public Health  
School of Public Health and Community Development  
Maseno University, Maseno, Kenya

**REF:** MSU/DRPC/MUERC/00107/14

**RE: Factors Influencing Utilization of Immunization Services by Caregivers of Children Aged Less than 1 Year in Asego Division, Homabay County.**  
**Proposal Reference Number: MSU/DRPC/MUERC/00107/14**

This is to inform you that the Maseno University Ethics Review Committee (MUERC) determined that the ethics issues raised at the initial review were adequately addressed in the revised proposal. Consequently, the study is granted approval for implementation effective this 21<sup>st</sup> day of November, 2014 for a period of one (1) year.

Please note that authorization to conduct this study will automatically expire on 20<sup>th</sup> November, 2015. If you plan to continue with the study beyond this date, please submit an application for continuation approval to MUERC Secretariat by 18<sup>th</sup> October, 2015.

Approval for continuation of the study will be subject to successful submission of an annual progress report that is to reach MUERC Secretariat by 18<sup>th</sup> October, 2015.

Please note that any unanticipated problems resulting from the conduct of this study must be reported to MUERC. You are required to submit any proposed changes to this study to MUERC for review and approval prior to initiation. Please advise MUERC when the study is completed or discontinued.

Thank you.

Yours faithfully,

A handwritten signature in black ink, appearing to read 'Dr. Bonuke Anyona'.

Dr. Bonuke Anyona,  
Secretary,  
Maseno University Ethics Review Committee.



Cc: Chairman,  
Maseno University Ethics Review Committee.

MASENO UNIVERSITY IS ISO 9001:2008 CERTIFIED



## Appendix VII: Proposal Approval Maseno SGS Letter



**MASENO UNIVERSITY**  
**SCHOOL OF GRADUATE STUDIES**

*Office of the Dean*

**Our Ref:** PG/MPH/00013/2012

Private Bag, MASENO, KENYA  
Tel:(057)351 22/351008/351011  
FAX: 254-057-351153/351221  
Email: [sgs@maseno.ac.ke](mailto:sgs@maseno.ac.ke)

Date: 25<sup>th</sup> August, 2014

**TO WHOM IT MAY CONCERN**

**RE: PROPOSAL APPROVAL FOR IRIS WEKU WANGA—  
PG/MPH/00013/2012**

The above named is registered in the Master of Public Health in the School of Public Health & Community Development, Maseno University. This is to confirm that her research proposal titled "Factors Influencing Utilization of Immunization Services by Caregivers of Children Aged Less than 1 Year in Asego Division, Homabay District" has been approved for conduct of research subject to obtaining all other permissions/clearances that may be required beforehand.

Prof. P.O. Owuor  
**DEAN, SCHOOL OF GRADUATE STUDIES**



*Maseno University*

*ISO 9001:2008 Certified*

