

Republic of Liberia



Ministry of Health

Immunization Knowledge, Attitude and Practice Survey

Report



August 2017

Foreword

The KAP on Immunization was a nationwide survey. The KAP report is a critical step to strengthening the current implementation of Expanded Program on Immunization in Liberia. Additionally, is the development of the program's communication strategy to complement its implementation.

It provides reliable information on parents and guidance knowledge, attitudes and practices to mother and childhood vaccination including Ebola Vaccine in Liberia.

The KAP report provides evidence to support planning for the immunization services as well as messaging to address current knowledge gaps, perception and attitudes towards immunization programs in Liberia. The need for publication of this report is timely and necessary for information dissemination and improved decision making at county, country and global levels.

The Ministry of Health in this regard appeals to all sectors to use the information in this document for planning, monitoring and evaluation of immunization programs as we. The figures shown here are expected to change with time and improvement especially with immunization coverage and knowledge distribution by counties; hence, continuous update of this information is key to tracking changes overtime in the EPI program.

Finally, on behalf of the Ministry of Health, I express our thanks and appreciation to the GAVI, UNICEF, CDC, PACs, LMH and the World Health Organization, for providing much needed financial and technical support, and all that participated in one way or another to ensure that this was achieved. Your efforts cannot be quantified.

Bernice T. Dahn, MD
Minister of Health, Liberia

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The KAP on Immunization was a nationwide survey. The Ministry leadership and its staff could not have completed this assignment alone, henceforth, we would like to acknowledge and commend all those individuals, institutions and organizations that contributed to the successful implementation of the KAP survey and as well crafting this the report.

We wish to recognize experts within the Ministry of Health, LISGIS, private sector, and health collaborative partners the GAVI, UNICEF, CDC, PACs, LMH and WHO, who participation in the KAP survey made invaluable contributions, the technical and financial assistance that have resulted in the development of this report. To all those who contributed in please accept our sincere appreciation of the leadership of the Ministry for the job well done.

We would however, on behalf of all who contributed, like to acknowledge the hard work of the Technical Team from the design of this study up to finalization and report writing. At the Ministry and LISGIS, We would like to recognize the efforts of the leadership, management and support from the rest of our team: Ministry of Health Team (Min. C Sanford Wesseh, Luke L. Bawo, Nelson K. Dunbar, Adolphus Clark, Martin Dumoe, Beatrice Reeves and Fulton Shannon), Mr. Joseph Nyan, LISGIS and the field assessors) who made this possible. We would also like to acknowledge partners; the GAVI, UNICEF, CDC, PACs, LMH and the WHO for providing both technical and financial support to the census.

Again, on behalf of the Ministry of Health, we thank you all for your support.

Francis Kateh, MD

Deputy Minister for Health Services/CMO

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Acronyms and Abbreviation

<i>BCG</i>	<i>Bacillus Calmette-Guerin</i>
<i>CSA</i>	<i>Civil Services Agency</i>
<i>DHO</i>	<i>District Health Officer</i>
<i>DHS</i>	<i>Demographic and Health Survey</i>
<i>EA</i>	<i>Enumeration Area</i>
<i>EPI</i>	<i>Expanded Program on Immunization</i>
<i>EVD</i>	<i>Ebola Virus Disease</i>
<i>FGDs</i>	<i>Focus Group Discussions</i>
<i>GOL</i>	<i>Government of Liberia</i>
<i>KAP</i>	<i>Knowledge Attitude and Practice</i>
<i>KII</i>	<i>Key Informant Interview</i>
<i>LD</i>	<i>Liberian Dollar</i>

<i>MMR</i>	<i>Maternal Mortality Rate</i>
<i>MOH</i>	<i>Ministry of Health</i>
<i>NGO</i>	<i>Non-Governmental Organization</i>
<i>OIC</i>	<i>Officer in-Charge</i>
<i>PPS</i>	<i>Probability Proportionate Size</i>
<i>PSU</i>	<i>Primary Sampling Unit</i>
<i>QC</i>	<i>Quality Control</i>
<i>QA</i>	<i>Quality Assurance</i>
<i>SSU</i>	<i>Secondary Sampling Unit</i>
<i>TT</i>	<i>Tetanus Toxoid</i>
<i>TSU</i>	<i>Tertiary Sampling Unit</i>
<i>USD</i>	<i>United State Dollar</i>
<i>VHF</i>	<i>Virus Hemorrhagic Fever</i>
<i>WHO</i>	<i>World Health Organization</i>

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Executive Summary

Immunization of children against communicable diseases is one of the most cost-effective strategies to decrease morbidity and mortality rate amongst children. In order to accomplish this strategy, high coverage of vaccination is essential to be maintained. Over the years, immunization services in Liberia have had gradual increase in coverage as a result of increase in the number of

health facilities including skilled staff, expansion of the cold chain, increased outreach activities, and high level of support from partners in Liberia.

Although there has been reported improvement in the immunization coverage for most antigens in Liberia, the performance of the national immunization program was suboptimal before the Ebola outbreak in March 2014. The 2013 demographic and health survey (DHS) indicated that immunization coverage for children aged 12 to <24 months was 55%, and there were repeated measles outbreak in the previous years.

The overall objective of the KAP Survey is to provide information on Liberian's immunization-related knowledge, attitudes and practices and explore the perceptions of vaccines including the Ebola vaccine.

The specific objectives aimed to determine immunization-related knowledge, attitudes and practices among men and women who are parents or caregivers to children under two years of age. It includes the following:

- 1. Determine attitudes, awareness and knowledge levels around immunization, including the issues of vaccine safety and importance;*
- 2. Determine barriers and motivators to immunizing their children and themselves (for women);*
- 3. Determine credible sources of messaging and information on immunization, as well as the preferred communication medium for immunization program implementation;*
- 4. Explore perceptions and awareness of vaccine preventable diseases;*
- 5. Explore and document cultural and socioeconomic factors that influence the adoption of recommended immunization behaviors (both acceptance and hesitancy); and*
- 6. Explore perceptions and awareness of Ebola vaccine and how its use in*

clinical trials or potential future use in response settings in Liberia may influence perceptions, attitudes, and behaviors regarding acceptance of immunizations.

The study was national in scope, with survey teams visiting all fifteen counties of the country. The study population for the quantitative component consisted of men and women between the ages of 15 - 49yrs who were parents or caregivers to children under 24 months old, who resided in the area selected for the survey; rural or urban areas.

The KAP survey was conducted among populations sampled from communities in all fifteen (15) counties: Montserrado, Bomi, Grand Cape Mount, Gbarpolu, Margibi, Grand Bassa, Rivercess, Sinoe, Grand Kru, Maryland, River Gee, Grand Gedeh, Nimba, Bong and Lofa. A random multi-cluster sampling technique was used to obtain the sample from all of the fifteen (15) counties plus Urban Montserrado. The 15 counties and Monrovia was the primary sampling unit (PSU). The total number of clusters (144) was distributed with probability proportionate to size (PPS) among the 15 counties selected and Monrovia. The final sample size for the survey after rounding up is 4,320.

Technicians of the Ministry of Health Research Unit and EPI division developed the questionnaire after an extensive literature search. The questionnaire comprised of five parts. The first part contained identification of the selected community, which include name of the County, district and Enumeration Areas (EAs) and the second part discussed the profile of the interviewer and the date of the interview. Part three focused on socio-demographic data of the respondents and the child while the fourth session consists of questions related to immunization knowledge, attitude, and practice. These questions were closed ended questions with "yes/no/don't know" answer format. The fifth part contained questions on the Ebola vaccine.

A three-day training of data collection teams (supervisors and interviewers) was conducted in June 2017. The MOH supported by partners recruited and trained 48 skilled enumerators and 8 supervisors who are experienced in field data collection activities. The data collectors were placed into 12 teams comprising of 4 persons per team for the entire study. Every team had a supervisor.

The survey result shows that most of the respondents (39.5%) were between the ages of 25 - 34 years followed by 15 - 24 years (36.3%). Also, a very small proportion (0.1%) of those interviewed did not know the age. Almost two-third (59.6%) of respondents were females while males account for 40.4% of the respondents. Additionally, one-third (33.6%) of those interviewed were urban residents while 66.4% (n=4,317) of the total surveyed population live in rural communities.

The survey findings revealed that 37.6% of respondents had no education, 22% completed primary educational level, 18.9% completed secondary education and 1.1% university education. Nearly two-third (60.6%) of the respondents were unemployed and 39.4% were employed. There were huge disparities between employed males (53.1%) and females (30.1%) with more males been employed than their female counter-part. Though less than half of the respondents were employed, their monthly income was very low with 89% earning US\$ 1-100 monthly.

Little over one-third of the respondents' were cohabiting (36.9%), 30.3% were single or never married and 30.4% were married. Most of the respondents 83% (n=3,581) were Christian, 14.4% (n=621) were Islam, 1.3% (n=55) traditionalists and those with no religion accounts for 1.2% (n=52).

The survey result found out that 97.2% of respondents have heard of immunization and health facilities (61.9%) were the major source of immunization knowledge and awareness followed by community health workers (41.1%) and Radio (31.7%).

The majority of the respondents (88.1%) indicated that vaccines prevent children from diseases and 19.9% said it cures children from sicknesses. Most of the respondents mentioned fever (86%) as the usual side effect followed by swelling (14.8%) and pain (14.2%). Interestingly, 99.8% think vaccines are important (25.5% indicated very good and 73.7% said good) and 97.6% of the respondents agreed that completing their child's vaccination schedule was important. Majority of the respondents (85.3%) prefer to receive immunization service in a public health facility compared to 11.6% private health facility.

It was found out that 95.4% (n=3,996) of children below 24 months were vaccinated while 4.6% have never been vaccinated. The proportion of unvaccinated children was high in rural areas (6.1%) than urban (1.8%). It was revealed that approximately 70% of the surveyed children were fully immunized and 30% defaulted from their vaccine schedule. Little over one-third (38%) of the respondents mentioned distance from vaccination sites as their impediment. The second major reason was the inability of mothers to take their children for vaccination because of illness (14%).

To improve immunization coverage and sustain gains made, the Government needs to construct health facilities in under-served communities. The program has to intensify their messages on the importance of immunization services and the retention of vaccination cards through radio messages and IEC materials.

Chapter 1 Introduction

1.1 Background of the KAP

Immunization of children against communicable diseases is one of the most cost-effective strategies to decrease morbidity and mortality rate amongst children. In order to accomplish this strategy, high coverage of vaccination is essential to be maintained.¹The World Health Organization (WHO) recommends that children receive the following vaccines: Bacillus Calmette-Guerin (BCG),

polio, pentavalent (diphtheria, pertussis, haemophilus influenza, tetanus, hepatitis B), measles, yellow fever, rota and pneumococcal vaccine. Furthermore, to achieve herd immunity in a target population, the immunization coverage of most antigens should be at least 85%.⁴

Liberia launched its Expanded Programme on Immunization (EPI) in 1978 with the aim of reducing 80% of childhood mortality and morbidity from measles, polio, diphtheria, neonatal tetanus, pertussis, and tuberculosis.² Pentavalent vaccine was successfully introduced in Liberia in 2008.

Currently, the immunization program covers the 5 Regions, 15 Counties and 92 health districts of Liberia. The national EPI Policy, as part of the National Health Policy, provides for one dose of BCG (at birth), three doses of Pentavalent (at 6, 10 and 14 weeks), four doses of OPV (at birth, 6, 10 and 14 weeks) one dose of measles (at 9 months) and one dose of yellow fever (at 9 months). In addition, every woman of childbearing age (14-49 years) is eligible for 5 doses of tetanus toxoid (TT) at minimum intervals of 4 weeks, 6 months, and 1 year. As part of the injection safety policy, the Program switched to the use of auto-disable syringes in 2005³.

Over the years, immunization services in Liberia have had gradual increase in coverage as a result of increase in the number of health facilities including skilled staff, expansion of the cold chain, increased outreach activities, and high level of support from partners in Liberia.

Although there has been reported improvement in the immunization coverage for most antigens in Liberia, the performance of the national immunization program was suboptimal before the Ebola outbreak in March 2014. The 2013 demographic and health survey (DHS) indicated that immunization coverage

for children aged 12 to <24 months was 55%, and there were repeated measles outbreak in the previous years⁵. These constraints became compounded during the 2014 Ebola outbreak with the implementation of the “no-touch” policy and a restriction on invasive procedures^{6,7}. These policies, coupled with introduction of the Ebola vaccine at some facilities in early 2015 during the later stages of the outbreak, appear to have resulted in community perceptions of an increased risk of contracting Ebola virus disease (EVD) in health facilities which, in turn, may have prevented caretakers from seeking immunization services for children.

Challenges about parents’ and caregivers’ knowledge, attitudes and practices toward immunization have been noted in several studies. Parents’ knowledge about immunization and their attitudes towards them highly influence vaccine uptake.⁸ Previous studies revealed misconceptions related to parents’ knowledge and negative attitudes towards childhood immunization. Mothers’ knowledge about vaccination was found to be quite low and their educational status was significantly associated with child’s vaccination coverage.⁹ Negative attitude, for example mothers’ own fear of vaccinations, was found to be significantly associated with the immunization status of their children¹⁰

Despite improvement in the post-Ebola era to nearly 85% childhood vaccination rate in Liberia in 2016, parents often do not follow the schedule in a timely manner, and do not fully understand the value of immunization. Thus, this study aimed at assessing parental knowledge, attitude and practice toward vaccination of parents and caregivers and their children.

1.2 Health Sector Overview

Liberia, a West African country is bordered with Sierra Leone to its west, Guinea to its north and Ivory Coast to its east. It covers an area of 111,369

square kilometers and has about 4 million people. It is a low-income country with an estimated GDP per capita of USD 454 in 2013. Although the real GDP growth in 2014 had been projected at 5.8%, it was estimated to have declined to 2.5% or less by the end of 2014 due to the EVD crisis. The country is geographically divided into five regions and 15 counties, with populations ranging from 57,913 in Grand Kru County to 1,118,241 in Montserrado County. The Liberian Health Sector, a sector striving to be rebuilt was hardly hit by the Ebola Virus Disease (EVD) in 2014. The EVD uncovered weaknesses in the health system and implementation of existing health policies thereby leading to the formulation of a health sector recovery and investment plan that will drive the implementation of the health sector for the next 6 years.

The Investment Plan for Building a Resilient Health System (2015-2021) complements the National Health Policy and Plan (2011-2021) and has nine investment areas (fit for purpose health workforce, community engagement, leadership and governance, health information system, quality health service delivery, medicines and technology, emergency preparedness and response, health financing and health infrastructure) geared toward strengthening the sector to become responsive and proactive in dealing with future outbreaks or public health emergencies.

The World Health Organization finally declared Liberia “Ebola Free” in November 2015 following a halt in human to human transmission of EVD after 14 consecutive months of intensive Ebola response activities implemented by the Ministry of Health, partners, line Ministries and agencies, donors and the communities across the country. The EVD crisis devastated the health sector, left thousands of children orphans and derailed the entire economy progress. The virus infected a total of 372 Health Workers leaving 184 dead. The health sector is gradually recovering from the EVD outbreak that devastated the

sector and enormous gains made in recent years in health service delivery.

The Liberia health sector has a three tiers system (primary, secondary, and tertiary levels) integrated by a decentralization policy. At the primary level are the clinics that provide basic primary care and integrated outreach services to population people outside of a 5km radius. The secondary level consists of first and second tiers referral facility (health centers and hospitals) that offer maternal and child health care, and basic and comprehensive emergency obstetric and neonatal care services. The tertiary level offers specialist services not provided at secondary level of care (Ref). A total of 727 health facilities currently exist and provides healthcare services across the 15 counties. Government owns and runs about 62.6% of the health facilities in the country followed by Private for profit 30.7% and NGO/private not for profit at 6.8%.

The Liberian health sector is still burden with high maternal deaths (MMR=1,072 per 100,000) live births (LDHS 2013), while the under-five mortality rate has reduced from 194 per 1000 births in 2000 to 94 in 2013. There are still challenges mainly due to TB, HIV and malaria burden in the country. While the malaria prevalence rate has reduced from to 28%, malaria still remains the highest cause of admission across health centers and hospitals. In 2015, majority of the in-patient admissions was due to malaria (33%) (Table one below).

Liberia Key Health Indicators

Indicators	Values	Year and Sources
<i>Under-five Mortality Rate</i>	<i>94 per 1000 Live Births</i>	<i>LDHS, 2013</i>
<i>Infant mortality Rate</i>	<i>54 per 1000 Live Births</i>	<i>LDHS, 2013</i>
<i>HIV Prevalence Rate</i>	<i>1.5%</i>	<i>DHS, 2007</i>

<i>Incidence of TB (all forms) per 100,000</i>	<i>299 per 100,000 Population</i>	<i>WHO, 2012</i>
<i>Malaria Prevalence Rate</i>	<i>28%</i>	<i>LMIS, 2011</i>
<i>Immunization Coverage of BCG</i>	<i>94%</i>	<i>LDHS, 2013</i>

1.3 Objectives

The overall objective is to provide information on Liberian's immunization-related knowledge, attitudes and practices and explore their perceptions of vaccines including the Ebola vaccine.

Specific Objectives

The specific objectives aimed to determine immunization-related knowledge, attitudes and practices among men and women who are parents or caregivers to children under two years old, as well as those of key informants, specifically:

- 1. Determine attitudes, awareness and knowledge levels around immunization, including the issues of vaccine safety, efficacy and importance.*
- 2. Determine barriers and motivators to immunizing their children and (for women) themselves or (for men) the mothers of their children.*
- 3. Determine credible sources of messaging and information on immunization, as well as the preferred communication medium for immunization program implementation.*
- 4. Explore perceptions and awareness of vaccine preventable diseases.*
- 5. Explore and document cultural and socioeconomic factors that influence the adoption of recommended immunization behaviors (both acceptance and hesitancy).*
- 6. Explore perceptions and awareness of Ebola vaccine and how its use*

in clinical trials or potential future use in response settings in Liberia may influence perceptions, attitudes, and behaviors regarding acceptance of immunizations.

Chapter 2 KAP Methodology

2.1 Research setting

Liberia is a West African country with a total population of approximately 4.2 million people. It is divided into five health regions, [Region 1: Bomi, Gbarpolu & Grand Cape Mount, Region 2: Montserrado, Grand Bassa & Margibi; Region 3: Bong, Lofa & Nimba; Region 4: Grand Gedeh, Rivercess & Sinoe, and Region 5: Maryland, Grand Kru & River Gee Counties], and administratively divided into 15 counties, with each county further sub-divided into districts which are, in turn, split up into clans. The study was national in scope, with survey teams visiting all fifteen counties of the country.

2.2 Research Population

The study population for the quantitative component consisted of men and women between the ages of 15 - 49yrs who were parents or caregivers to children under 24 months old, who resided in the area selected for the survey; rural or urban areas. Participants were not excluded based on marital status, occupation, or employment status. Men and women who do not reside in the area being surveyed will be excluded from the study population.

Determination of Sample Size

The sample size of the study was derived using the following steps:

Step 1: The calculation of the sample size (n) is a process that begun with the equation below:

$$Z^2 \frac{P(1-P)}{e^2}$$

The symbols in the equation represent the following:

Z	Level of Confidence Measure	1.96
E	Margin of Error (MOE)	0.05
P	Baseline levels of the indicators	0.5

Executing the equation will yield an initial sample size (n) of 384.16.

Step 2: The second step in the sample size calculation is the multiplication of the initial sample size by a) the Design Effect (diff) which by recommendation is set at (1.5) and b) by the number of age/sex estimates. Ideally, the age/sex estimate is set at 8 or 10 but due to time limitation and resource constraint the number of age/sex estimate used in the equation is 6.

$$n = 384 \times 1.5 \times 6 = 3456$$

Step 3: An adjustment was made for the anticipated non-response of 20% by dividing the sample size in step 2 with the anticipated response rate. An anticipated response rate of (0.8) is selected by default.

$$n = 3456 \div 0.8 = 4,320$$

The final sample size for the survey after rounding up is 4,320.

Sampling Frame

The KAP survey was conducted among populations sampled from communities in all fifteen (15) counties: Montserrado, Bomi, Grand Cape Mount, Gbarpolu, Margibi, Grand Bassa, Rivercess, Sinoe, Grand Kru, Maryland, River Gee, Grand Gedeh, Nimba, Bong and Lofa; additionally Urban Montserrado. The survey adapted a random multi-cluster sampling technique to obtain the sample from all of the fifteen (15) counties plus Urban Montserrado. The Multi-stage cluster sampling technique was used for the selection of the sampling units. The 15 counties and Monrovia was the primary sampling unit (PSU). The total number of clusters (144) was distributed with probability proportionate to size (PPS) among the 15 counties selected and Monrovia.

The Clusters served as the secondary sampling unit (SSU), the assigned numbers of clusters was selected from the list of enumeration areas (EAs) as defined by LISGIS 2008 Census report. However, the total number of samples was distributed among all counties with probability proportionate to size using 2017 inter-census population estimates of 2.1% growth rate (1,954,755 population). In each Cluster, 30 households was selected and interviewed with equal proportion of males to females.

County (PSU)	Pop (15-49 years)	# of Cluster (SSU)	# of HHs (TSU)	Tot HHs
Bomi	43233	3	30	90
Bong	174369	13	30	420
Bassa	116216	9	30	270
Cape Mount	69710	5	30	150
G.Gedeh	77331	6	30	150
G.Kru	30121	2	30	60
Gbarpolu	46450	3	30	120
LOFA	146963	11	30	330
Margibi	116070	9	30	270
Maryland	74266	5	30	150
Montserrado	51759	4	30	90

<i>Greater Monrovia</i>	<i>638359</i>	<i>47</i>	<i>30</i>	<i>1,380</i>
<i>Nimba</i>	<i>240318</i>	<i>18</i>	<i>30</i>	<i>540</i>
<i>Rivercess</i>	<i>38571</i>	<i>3</i>	<i>30</i>	<i>90</i>
<i>Sinoe</i>	<i>56740</i>	<i>4</i>	<i>30</i>	<i>120</i>
<i>River Gee</i>	<i>34279</i>	<i>3</i>	<i>30</i>	<i>90</i>
<i>Total</i>	<i>1954755</i>	<i>144</i>		<i>4,320</i>

Random Selection of Households (TSU)

Interviews was conducted with one parent or caregiver of children <2 years old in each of the households selected. When the survey teams reach their designated towns each day, they selected their starting households and subsequent households as follows:

- 1. They locate a central point (approximate geographic center) in the town.*
- 2. They then spin a pencil/pen to point out or randomly select a direction.*
- 3. Thereafter, the team walks to the periphery of the town in the direction pointed out by the pencil, counting the number of households along the way.*
- 4. They obtain a random number between 1 and the number of households in that line.*
- 5. They sample the household on that line which corresponds to that random number.*
- 6. The next household to be sampled is the nearest household to the right whose front door is three houses away from the one they just visited.*
- 7. They continue consistently in this way until the required number of households is been sampled.*

Qualitative Research Component

The qualitative component was assessed immunization-related public knowledge, attitudes, and behaviors among parents/caregivers and key informants in the selected communities through focus group discussions (FGDs) and individual key informant interviews (KII), respectively.

Sampling Frame and Size

The FGDs and KIIs were conducted in five randomly selected counties within Liberia's five health regions (one county per region). From each selected county, one community and one district were randomly selected for FGDs and KIIs, respectively. Because of the much larger population size and density of Monrovia/Montserrado County relative to the rest of the country, one additional community and district were randomly selected from Monrovia/Montserrado County for FGDs and KIIs. Two FGDs and three KIIs were conducted in each of the six selected communities or districts, for a total of 12 FGDs and 18 KIIs.

Key Informant Interviews

In each of the six districts in which the selected FGD communities are situated, an individual KII was conducted with the District Health Officer (DHO), the Officer in Charge (OIC) from a health facility (HF) within that district, and a community religious leader residing within the catchment area of the selected health facility, for a total of 18 KIIs.

2.3 Study Design

Study design refers to the overall approach that is used to achieving the objectives of this study and to reach a conclusion on the objectives. The study employed two methods; quantitative and qualitative to collect primary data. As a mean of achieving the study specific objectives a cross-sectional design aimed at assessing immunization-related knowledge, attitudes, and behaviors of participants was used.

2.4 Questionnaire Design

Technicians of the Ministry of Health Research Unit and EPI division developed the questionnaire after an extensive literature search and it comprised five parts. The first part contained identification of the selected community, which include name of the County, district and Enumeration Areas (EAs). The second part discussed the profile of the interviewer and the date of the interview. Part three focused on socio-demographic data of the respondents and child while the fourth session consist series of questions regarding knowledge, attitude, and practice. All these questions were “yes/no/don’t know” answer format. The fifth part contained questions on the Ebola vaccine.

A pilot test of the questionnaire was conducted. The quantitative survey tool was pre-tested in two communities namely: King Gray Two and Bassa Communities while the qualitative tool was piloted in the Peace Island Community. Feedbacks from the pretests were incorporated into the KAP questionnaire and FGD and KII topic guides. Beside the structured questionnaire, there were key questions formulated for the conduct of Focus Group Discussion (FGD).

2.5 Training of data collectors

A three-day training of data collection teams (supervisors and interviewers) was conducted in June 2017. The MOH supported by partners recruited and trained 48 skilled enumerators and 8 supervisors who are experienced in field data collection activities. The data collectors were placed into 12 teams comprising of 4 persons per team for the entire study. Every team had a supervisor. Additionally, 5 regional monitors and 6 information technology experts facilitated the training exercise.

The quantitative survey tool was pre-tested in two communities namely: King Gray Two and Bassa Communities while the qualitative tool was piloted in the

Peace Island Community. Feedbacks from the pretests were incorporated into the KAP questionnaire and FGD and KII topic guides.

The training focused on the following core areas:

- Overall research protocols and guidelines, including study objectives;*
- Review and administration of data collection tools (quantitative and qualitative)*
- Training of data collectors using the handheld devices (described below)*
- Quality control and assurance (QA/QC)*
- Informed consent, safety and security precautions*

2.6 Data collection, management and analysis

The Data collection for the quantitative component of the KAP field exercise occurred for 25 days June 2 - July 2, 2017.

The study was national in scope, with survey teams visiting all fifteen counties of the country. Field data collection was conducted using both hard copies of questionnaires and hand-held devices (i.e., tablets). A total of 144 clusters were assessed. However, due to hard to reach terrains or improper location of clusters, some clusters were replaced. Please see below in table: (paste table here)

➤ Nimba County 3 communities were replaced.

- Gbar Town was replaced with (Voipa) in YarweinMehnsannah (Nimba),*
- Cooper Village was replaced with (Tondin town) Garr Bain (Nimba),*
- Quikemuah/Grasco was replaced with (Ziah Town) in Doe District (Nimba)*
- Gbiand Doru were replaced with Ganta LOIC compound and Nengbain*

➤ Maryland County

- Jewelbo community was replaced with Teligen*

➤ *River Gee County*

- *Sector community was replaced with Kelewken*

➤ *Grand Gedeh County*

- *Sayu-O was replaced with Barteljam community*
- *Tempo community was replaced with Ziah community in Grand Gedeh*
- *Boe-Geewon replaced with Toe's town in Grand Gedeh.*

Qualitative Component

The qualitative component of the KAP survey started on June 9, 2017 a week later than the quantitative component of the survey due to delays in funds arrangement and ended July 5, 2017. This component was conducted within five counties (Bomi, Bong, Margibi, Maryland and Rivercess) from the five health regions of the fifteen counties in addition to Monrovia city. A total of 12 communities (2 communities per county) were assessed, while 12 focus groups discussions and 12 key informant interviews were conducted across the five counties including Monrovia City.

Survey Administration

The Research Unit, in collaboration with the EPI Division of the MOH, provided an oversight of the entire implementation of the study. At the central level there were information technology experts with adequate knowledge and experience on the handheld devices (tablets) that provided technical feedback and support daily as data collection continues in the field. The data collection team was monitored by field facilitators comprising of MOH & partners in the five health regions of Liberia. The Field Coordinators were responsible for field coordination, data quality and review completed questionnaires.

2.7 Limitations and Challenges of the KAP

The technical team including data team leads noticed several limitations/challenges as following:

- Some of the communities Enumeration Areas (EAs) names were misspelled and their locations were not clearly identified, thus leading to some replacement of clusters or communities during the survey;*
- Due to deplorable road conditions, team members were forced to use motorbike to access some EAs;*
- Some gadgets had problems with transmission of data and there were at times little difference between study tool in both the paper base questionnaire and the gadgets which led to serious delay;*

Several teams faced challenge to identifying eligible men for the study, especially in counties where men are heavily involved in farming activities. There were difficulties in arranging interviews with key respondents in the counties, due to their busy schedules with their farm work. Most leaders were not aware or have prior notice about the survey.

Chapter 3 KAP Findings and Discussions

The Immunization Knowledge, Attitude and Practice (KAP) Survey was conducted with the intent to ascertain parents' and caregivers understanding of the Liberian immunization program and their attitude and practice towards

immunization services uptake. The major determinants of health services utilization generally include access, education level, income and place of residence. However, factors that contribute significantly to immunization services consumption are access to services, parents' or caregivers' awareness and knowledge of the vaccine.

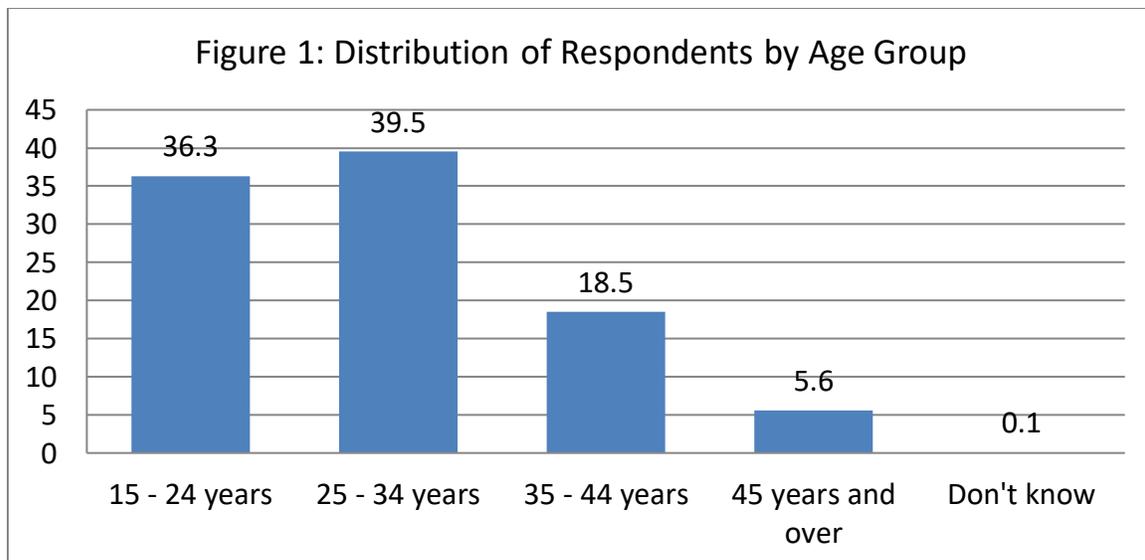
The KAP survey gathered information on respondents' social demographic characteristics. These characteristics, which include age, sex, place of residence, income or employment status and educational level, are important determinants for service utilization.

3.1 Social Demographic Characteristics of Respondents

3.1.1 Respondents Age and Sex

The survey result shows that most of the respondents (39.5%) were between the ages of 25 - 34 years followed by 15 - 24 years (36.3%). Also, a very small proportion (0.1%) of those interviewed did not know the age. The mean age of caregiver was 28.8 years. Figure 1 depicts the distribution of respondents by age group.

Figure 1 Distribution of Respondents by Age Group



The survey result also shows that almost two-third (59.6%) of respondents were female while male accounts for 40.4% of respondents. Additionally, one-third (33.6%) of those interviewed were urban residents while rural constitute 66.4% of the total surveyed population (n=4,317). Table 1 presents the distribution of respondents by county and sex.

Table 1 Distribution of Respondents by Sex and County

<i>Table 1: Distribution of Respondents by Sex and County</i>					
<i>County</i>	<i>Total</i>	<i># of Male</i>	<i>Percent of Male</i>	<i># of Female</i>	<i>Percent of Female</i>
<i>Bomi</i>	<i>90</i>	<i>23</i>	<i>25.6%</i>	<i>67</i>	<i>74.4%</i>
<i>Bong</i>	<i>390</i>	<i>177</i>	<i>45.4%</i>	<i>213</i>	<i>54.6%</i>
<i>Gbarpolu</i>	<i>90</i>	<i>34</i>	<i>37.8%</i>	<i>56</i>	<i>62.2%</i>
<i>Grand Bassa</i>	<i>270</i>	<i>119</i>	<i>44.1%</i>	<i>151</i>	<i>55.9%</i>
<i>Grand Cape Mt</i>	<i>150</i>	<i>43</i>	<i>28.7%</i>	<i>107</i>	<i>71.3%</i>
<i>Grand Gedeh</i>	<i>179</i>	<i>84</i>	<i>46.9%</i>	<i>95</i>	<i>53.1%</i>
<i>Grand Kru</i>	<i>61</i>	<i>31</i>	<i>50.8%</i>	<i>30</i>	<i>49.2%</i>
<i>Lofa</i>	<i>330</i>	<i>139</i>	<i>42.1%</i>	<i>191</i>	<i>57.9%</i>
<i>Margibi</i>	<i>270</i>	<i>110</i>	<i>40.7%</i>	<i>160</i>	<i>59.3%</i>
<i>Maryland</i>	<i>150</i>	<i>74</i>	<i>49.3%</i>	<i>76</i>	<i>50.7%</i>
<i>Montserrado</i>	<i>1,498</i>	<i>572</i>	<i>38.2%</i>	<i>926</i>	<i>61.8%</i>
<i>Nimba</i>	<i>539</i>	<i>187</i>	<i>34.7%</i>	<i>352</i>	<i>65.3%</i>
<i>Rivercess</i>	<i>90</i>	<i>47</i>	<i>52.2%</i>	<i>43</i>	<i>47.8%</i>
<i>River Gee</i>	<i>91</i>	<i>44</i>	<i>48.4%</i>	<i>47</i>	<i>51.6%</i>
<i>Sinoe</i>	<i>119</i>	<i>61</i>	<i>51.3%</i>	<i>58</i>	<i>48.7%</i>
Total	4,317	1,745	40.4%	2,572	59.6%

The survey gathered information on respondents' educational level. Education is an important determinant of immunization uptake. Demographic and Health Survey (DHS) over the years have documented the mothers' and caregivers' educational level has influence on childhood immunization outcome.

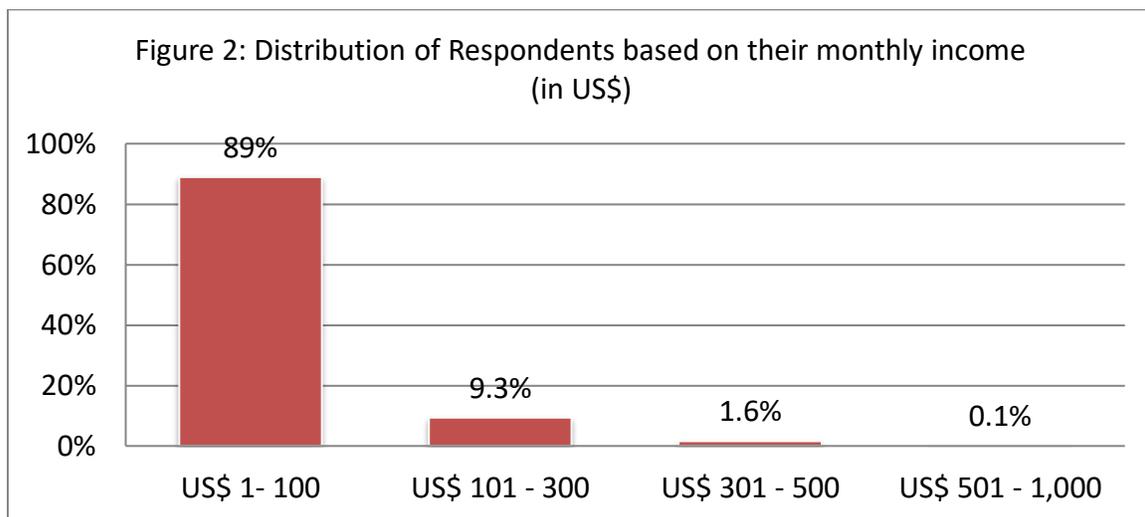
The survey findings revealed that 37.6% of respondents had no education, 22% completed primary educational level, 18.9% completed secondary education and 1.1% university education. Table 2 presents respondents educational level by county.

Table 2 Distribution of Respondents by highest education level completed

County	None	Elementary	Junior High	Senior High	University	Technical	Unknown
Bomi	35.6%	34.4%	21.1%	8.9%	-	-	-
Bong	64.6%	21.8%	9.0%	4.4%	0.3%	-	-
Grand Bassa	54.1%	23.3%	13.0%	8.9%	0.4%	-	0.4%
Grand Cape Mount	34.7%	22.0%	30.7%	10.7%	2%	-	-
Grand Gedeh	38.0%	25.1%	24.0%	12.8%	-	-	-
Grand Kru	26.2%	36.1%	19.7%	18.0%	-	-	-
Lofa	46.7%	25.5%	20.0%	7.0%	0.6%	0.3%	-
Margibi	38.5%	30.7%	20.4%	8.5%	1.1%	0.7%	-
Maryland	45.3%	26.0%	16.7%	9.3%	2.7%	-	-
Montserrado	25.9%	13.2%	21.0%	28.8%	9.9%	1.0%	0.3%
Nimba	42.3%	25.2%	19.1%	12.8%	0.2%	0.2%	0.2%
Rivercess	27.8%	38.9%	15.6%	14.4%	2.2%	1.1%	-
Sinoe	22.7%	28.6%	25.2%	21.8%	1.7%	-	-
River Gee	40.7%	33.0%	18.7%	7.7%	-	-	-
Gbarpolu	28.9%	36.7%	13.3%	18.9%	1.1%	-	1.1%
Total	37.6%	22.0%	19.1%	16.7%	3.9%	0.5%	0.2%

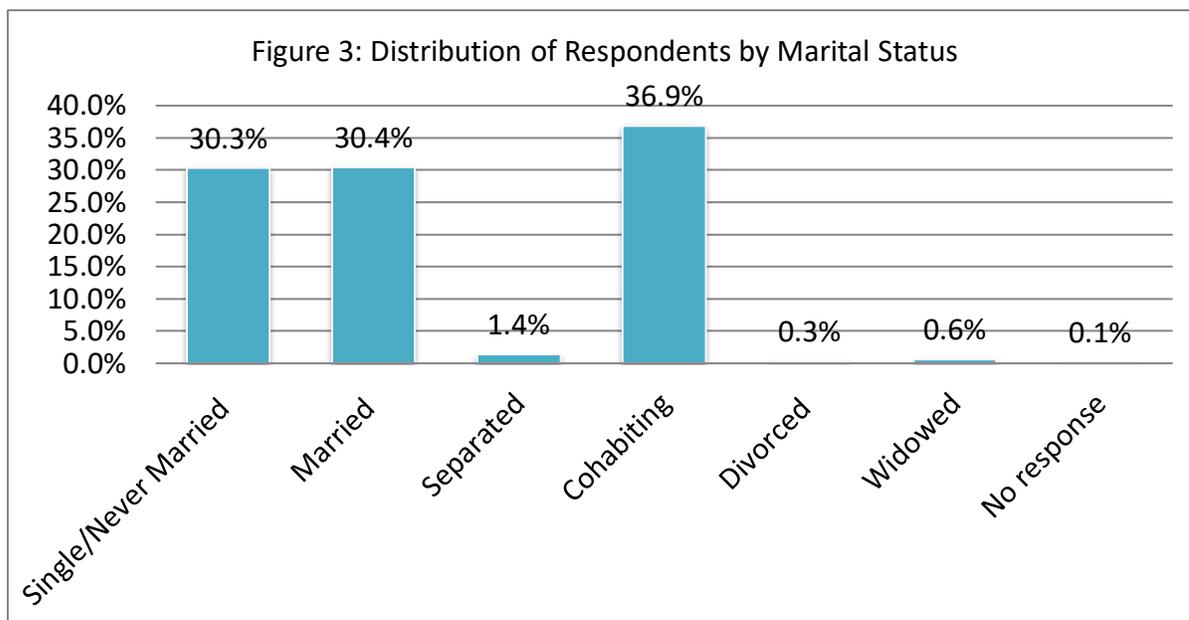
The KAP survey found out that nearly two-third (60.6%) of the respondents were unemployed and 39.4% were employed. There were huge disparities between employed males (53.1%) and females (30.1%) with more males been employed than their female counter-part. Though less than half of the respondents were employed, their monthly income was very low with 89% earning US\$ 1-100 monthly. Figure 3 depicts respondents by their monthly income in United States Dollars.

Figure 2 Distribution of respondents by their monthly income in United States Dollars



Information on respondents' marital status was collected during the survey. The majority of the respondents were cohabiting (36.9%), 30.3% were single or never married and 30.4% were married. Figure 3 shows the distribution of respondents by marital status.

Figure 3 Distribution of respondents by marital status



The survey collected information on respondents' religious affiliation. Result from the survey shows 83% (n=3,581) of the interviewees were Christian, 14.4% (n=621) were Islam, 1.3% (n=55) were traditionalists and those with no religion accounts for 1.2% (n=52).

The survey respondents were further disaggregated into parents and caregivers. Parents (90.5%) account for the highest proportion of respondents and caregivers constitutes 9.4%.

3.2 Childhood Vaccination

Immunization is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine. Vaccines stimulate the body's own immune system to protect an individual against infection or disease or prevent or ameliorate infectious disease. It is one of the most significant contributions of the medical association to mankind is the advent of vaccines. They are the most powerful, safe and cost-effective measures for the prevention and control of a number of diseases. The historical accomplishments of eradicating dreadful disease such smallpox, inspired the World Health Organization to ask its member countries to launch immunization against six vaccine preventable diseases in its national immunization schedule.

In May 1974, the WHO launched the Expanded Immunization Program (EPI) globally with focus on preventing six vaccine-preventable diseases. Vaccines protect against diseases or conditions such as measles, mumps, rubella, hepatitis B, polio, tetanus, diphtheria, and pertussis (whooping cough). Immunizations are very important for adults as well as children.

Immunization is a proven strategy for controlling and eliminating life-threatening infectious diseases and is estimated to avert between 2 and 3 million deaths each year. It is one of the most cost-effective health investments, with proven strategies that make it accessible to even the most hard-to-reach and vulnerable population. It has clearly defined target groups; it can be delivered effectively through outreach activities; and vaccination does not require any major lifestyle change.

3.2.1 Awareness and Knowledge on childhood vaccination

Improving childhood vaccination coverage is a critical component of Liberia's National immunization strategy. There are many factors known to influence immunization uptake of which parents' understanding and perception of childhood immunization has largely been overlooked. Strategies to change behavior often include information to improve people's knowledge about the problem or its solutions in the hope that it will motivate them to make a change. There is tons of research to show that information on its own is very unlikely to lead to noticeable change in behaviour.

The survey asked respondents about knowledge of childhood vaccination. The survey result found out that 97.2% of respondents have heard of immunization.

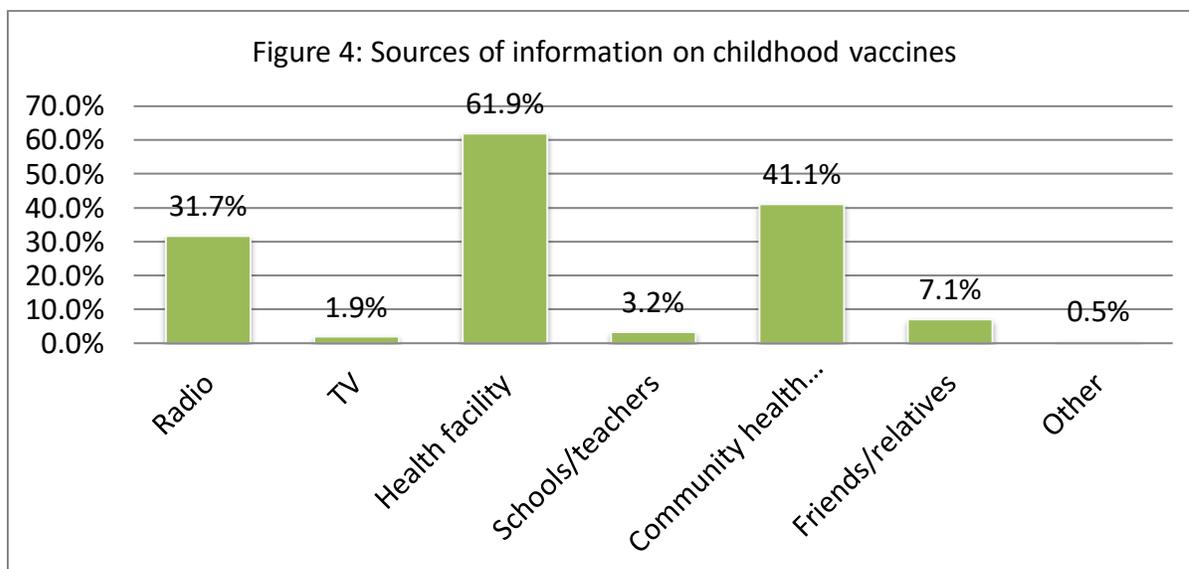
Table 3 Distribution of Respondents according to those who have heard about vaccines for children

<i>County Name</i>	<i>Number</i>	<i>Male</i>	<i>Percent</i>	<i>Female</i>	<i>Percent</i>	<i>% Total</i>
<i>Bomi</i>	90	22	24.4	67	74.4	98.9
<i>Bong</i>	390	170	43.6	212	54.4	97.9
<i>Gbarpolu</i>	90	34	37.8	56	62.2	100.0
<i>Grand Bassa</i>	270	119	44.1	150	55.6	99.6
<i>Grand Cape Mount</i>	150	41	27.3	106	70.7	98.0
<i>Grand Gedeh</i>	179	83	46.4	95	53.1	99.4
<i>Grand Kru</i>	61	30	49.2	30	49.2	98.4
<i>Lofa</i>	330	138	41.8	191	57.9	99.7
<i>Margibi</i>	270	110	40.7	159	58.9	99.6
<i>Maryland</i>	150	72	48.0	76	50.7	98.7
<i>Montserrado</i>	1494	547	36.6	911	61.0	97.6
<i>Nimba</i>	539	151	28.0	324	60.1	88.1
<i>Rivercess</i>	90	47	52.2	43	47.8	100.0
<i>River Gee</i>	91	42	46.2	47	51.6	97.8
<i>Sinoe</i>	119	61	51.3	58	48.7	100.0
<i>Total</i>	4,313	1667	38.7	2,525	58.5	97.2

Information dissemination and the channel of communication are critical for immunization uptake. The survey asked respondents about their source of immunization awareness and knowledge. The result shows that health facilities (61.9%) were the major source of immunization knowledge and awareness

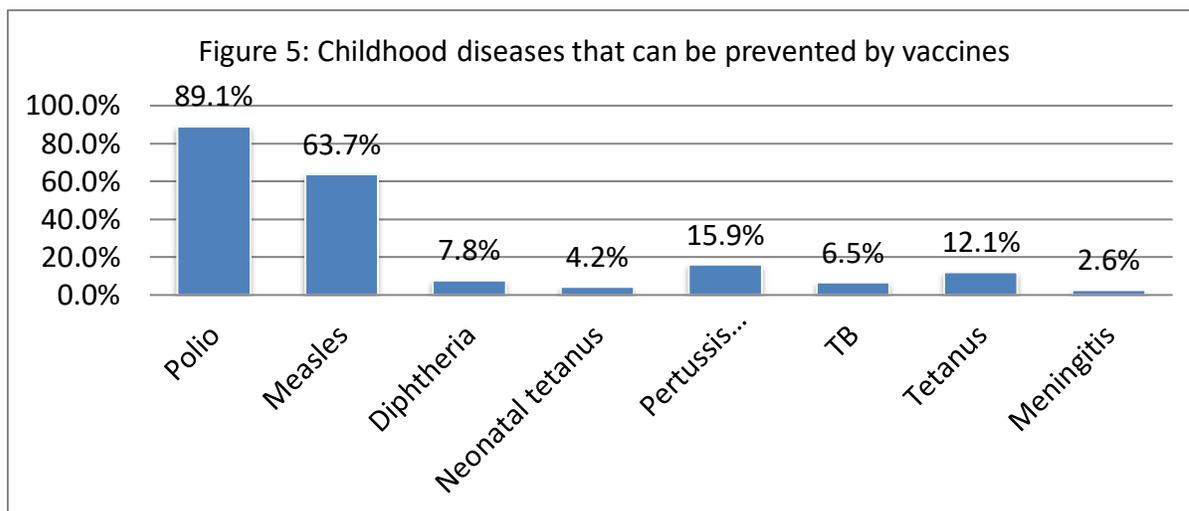
followed by community health workers (41.1%) and Radio (31.7%). Figure 4 shows sources of information on childhood vaccines.

Figure 4 Sources of information on childhood vaccines



Respondents also listed the benefits that are accrued from immunization services. The majority of the respondents (88.1%) indicated that vaccines prevent children from diseases, while 19.9% said it cures children from sicknesses and 2.6% mentioned others. A minute proportion (2.9%) could not state any benefit of vaccine. On the other hand, 88.2% of the respondents said immunization starts immediately after birth and 11.8% mentioned at six weeks after birth. Further assessment of respondents' awareness and knowledge revealed that polio (89.1%) was the most mentioned disease that is prevented by vaccine, followed by Measles (63.7%) and Pertussis (15.9%). Figure 5 presents childhood diseases that can be prevented by vaccines.

Figure 5 Childhood diseases that can be prevented by vaccines



Knowledge on Side Effects of Childhood Vaccine

Childhood immunization side effects are usually mild and only occur in a few patients. However, vaccines, like all medicines, are capable of causing serious side effects, but these serious adverse events are extremely rare. The risk of these adverse effects is much lower than the benefit that the vaccines (immunizations) provides.

The most common immunization side effects are generally mild and self-limiting, which means they are not serious and they go away by themselves. The include:

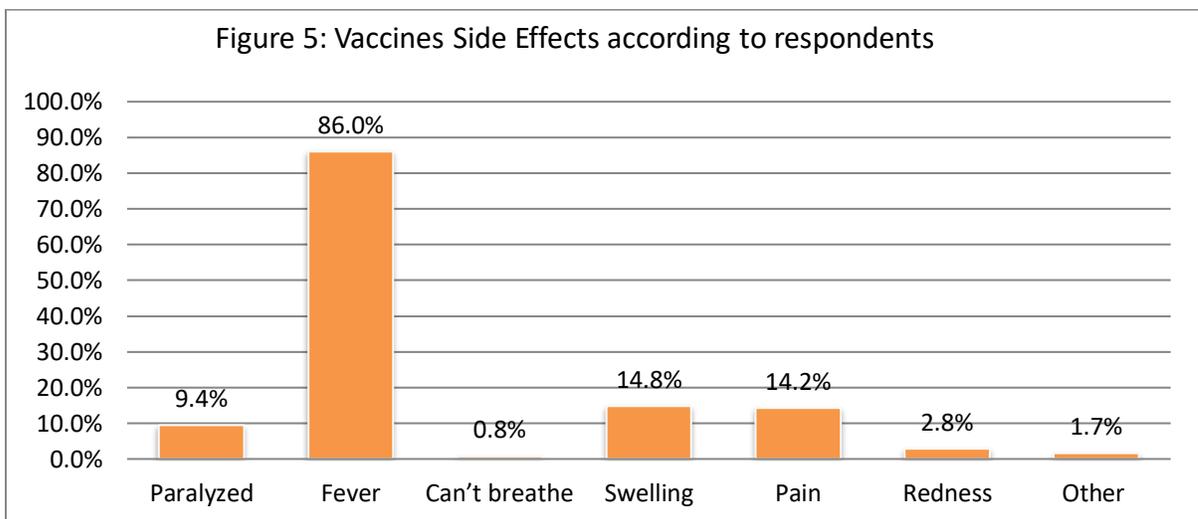
- Local redness or swelling at the site of the injection;*
- Fever-most fevers are mild but in occasional cases, the fever can be accompanied by seizures such as this are benign although they are very scary at the time;*
- Crying a bit more than usual;*
- Poor appetite; and*
- Rash - often seen a week to days*

Serious Immunization side effects are not common and do not usually cause any lasting damage or illness. They include:

- *Allergic reactions-the most severe type of allergic reaction is an anaphylactic reaction and this usually occurs within 30 minutes of having the injection;*
- *Hypotonic Hypo-responsive Episodes (HHE)-these are when the baby becomes pale floppy and very responsive;*
- *Serum sickness- is a type of hypersensitivity reaction that causes a rash, fever and sore joints and can occur days after the vaccination.*

The survey participants were asked about their knowledge regarding vaccine side effect. Most of the responded mentioned fever (86%) as the usual side effect followed by swelling (14.8%) and pain (14.2%). Figure 5 below depicts vaccines side effects according to respondents.

Figure 5 Vaccine Side effects according to respondents



3.3 Attitudes of Respondents Towards Childhood Vaccination

Importance of Childhood Vaccination

Immunization is a proven tool for controlling and eliminating life-threatening infectious disease and is estimated to avert between 2 - 3million deaths each year. It is one of the most cost-effective health investments with proven strategies that make it accessible to even the most hard-to-reach and

vulnerable populations. It has clearly defined target groups and can be delivered effectively through outreach activities.

The KAP Survey asked respondents whether they think vaccines were good. Interestingly, 99.8% think vaccines are important (25.5% indicated very good and 73.7% said good). Only 0.4% of the respondents mentioned that vaccines were bad.

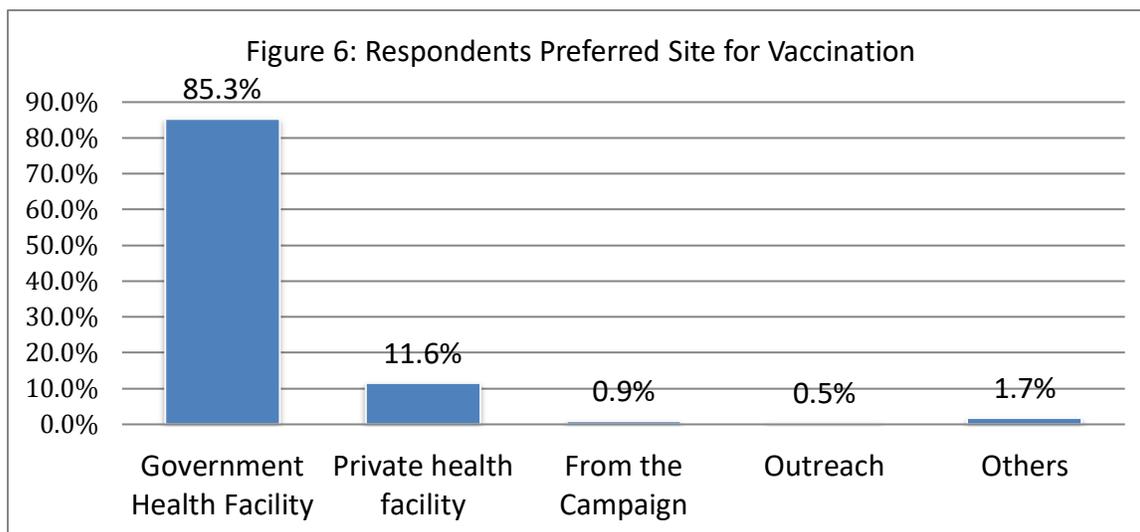
The survey participants they further asked about how they think completing their child's vaccination according to schedule is important. The majority of the respondents (97.6%) agreed that completing their child's vaccination schedule was important. A minute proportion of respondent said no (0.9%) and 1.5% don't know.

Preferred Site for Child Vaccination

The place immunization services are provided is crucial for utilization of services. Generally, if a service delivery point is far from the users, access and utilization will be a challenge. Additionally, distance is not the only precursor of utilization but the facility type and ownership (public verse private). Therefore, the survey ascertain respondents' preferred site for vaccination.

The survey result shows that 85.3% of the respondents prefer to receive immunization service in a public health facility compared to 11.6% private health facility. Figure 6 below presents respondents preferred site for vaccination.

Figure 6 Respondents preferred site for vaccination



3.4 Practice of Respondents Towards Childhood Vaccination

Immunization Status of Children Under 24 Months

The immunization status of children under age 5 is of great importance to only the immunization program but to the community and child. If a child is not protected against childhood diseases through vaccines, he/she is vulnerable to any vaccine preventable disease and is a risk to the community. Immunization plays a pivotal role in child survival and disease prevention and control.

The KAP Survey collected information on children below 2 years immunization status. It was found out that 95.4% (n=3,996) of children below 24 months were vaccinated while 4.6% have never been vaccinated. The proportion of unvaccinated children was high in rural areas (6.1%) than urban (1.8%). Table 4 presents respondents' according to whether their child had ever been vaccinated.

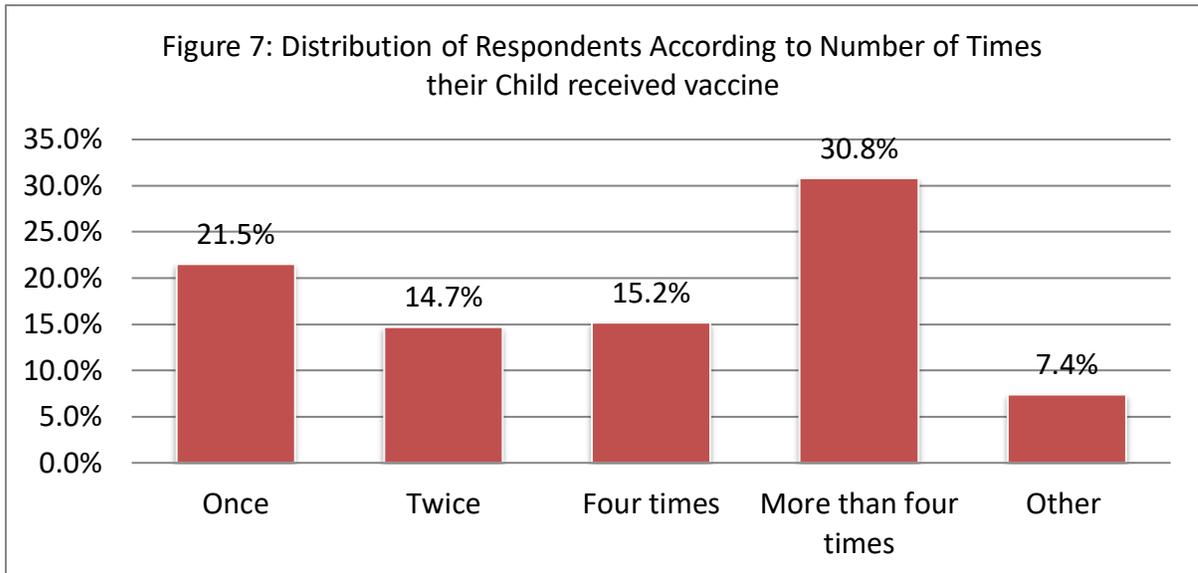
Table 4 Distribution of Respondents according to whether their child had ever been vaccinated

County	Total	Percent	Yes	Percent	No	Percent
Bomi	89	100	86	96.6	3	3.4
Bong	384	100	344	89.6	40	10.4

<i>Gbarpolu</i>	90	100	86	95.6	4	4.4
<i>Grand Bassa</i>	269	100	252	93.7	17	6.3
<i>Grand Cape Mount</i>	147	100	147	100.0	0	0
<i>Grand Gedeh</i>	178	100	178	100.0	0	0
<i>Grand Kru</i>	60	100	50	83.3	10	16.7
<i>Lofa</i>	329	100	329	100.0	0	0
<i>Margibi</i>	269	100	249	92.6	20	7.4
<i>Maryland</i>	148	100	123	83.1	25	16.9
<i>Montserrado</i>	1,454	100	1,428	98.2	26	1.8
<i>Nimba</i>	475	100	450	94.7	25	5.3
<i>Rivercess</i>	90	100	88	97.8	2	2.2
<i>River Gee</i>	89	100	70	78.7	19	21.3
<i>Sinoe</i>	118	100	116	98.3	2	1.7
Total	4,189	100	3,996	95.4	193	4.6

The survey investigated the number of times each respondents' child received immunization services. According to the result, 21.5% indicated once, 14.7% said twice and only one-third of the respondents' mentioned more than four times. This partly explained reasons for high defaulters rate and limited number of fully immunized children.

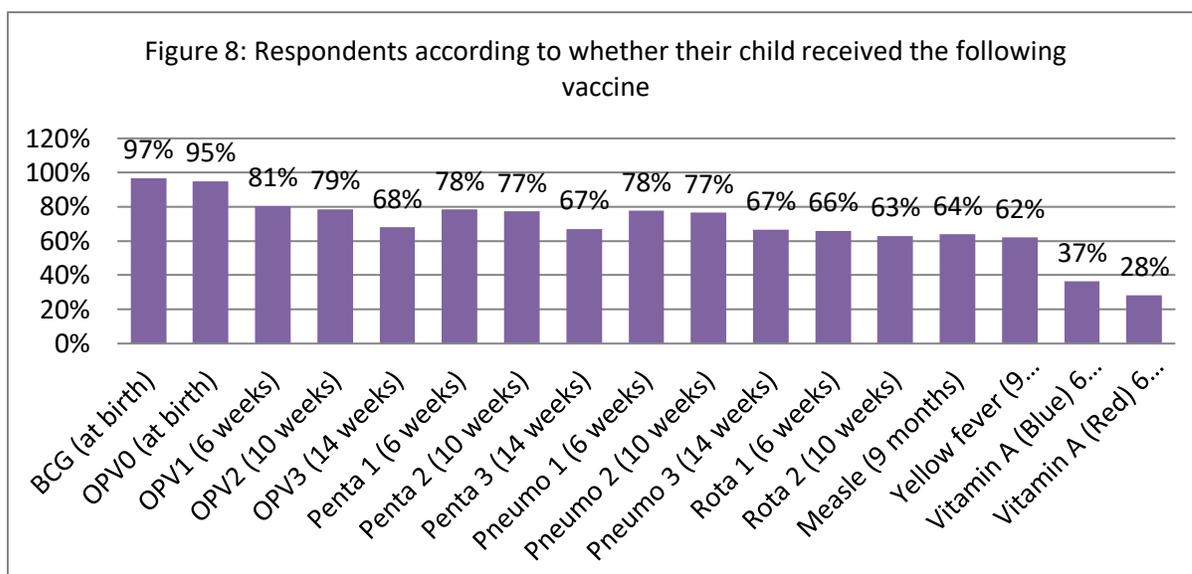
Figure 7 Distribution of respondents according to the number of times their child received vaccines



The survey collected information on the type of vaccines that were received by children during their visit to the health facilities. The Liberia immunization program provides six different types of antigens to children less than one year of age according to fixed schedule. These antigens include; BCG, Polio, Pentavalent, Pneumococcus conjugate vaccine (PCV), Rotavirus, Measles and Yellow Fever.

The administration of Vitamin A supplement during vaccination is also important for child's health. It provides protection for children against diarrhea, measles and pneumonia. The survey results show high coverage of BCG and polio vaccines at birth (97% & 95%) and low administration of Vitamin A (37% & 28%).

Figure 8 Respondents according to whether their child received the following vaccines.



The survey further gathered information on children fully immunization status. The result revealed that approximately 70% of the surveyed children were fully immunized and 30% defaulted from their vaccine schedule. The lowest fully immunization coverage was found in Grand Kru County (30%), Grand Bassa (36.9%) and Nimba County (42.4%). Table 5 presents respondents' according to whether their child completed vaccination according to schedule.

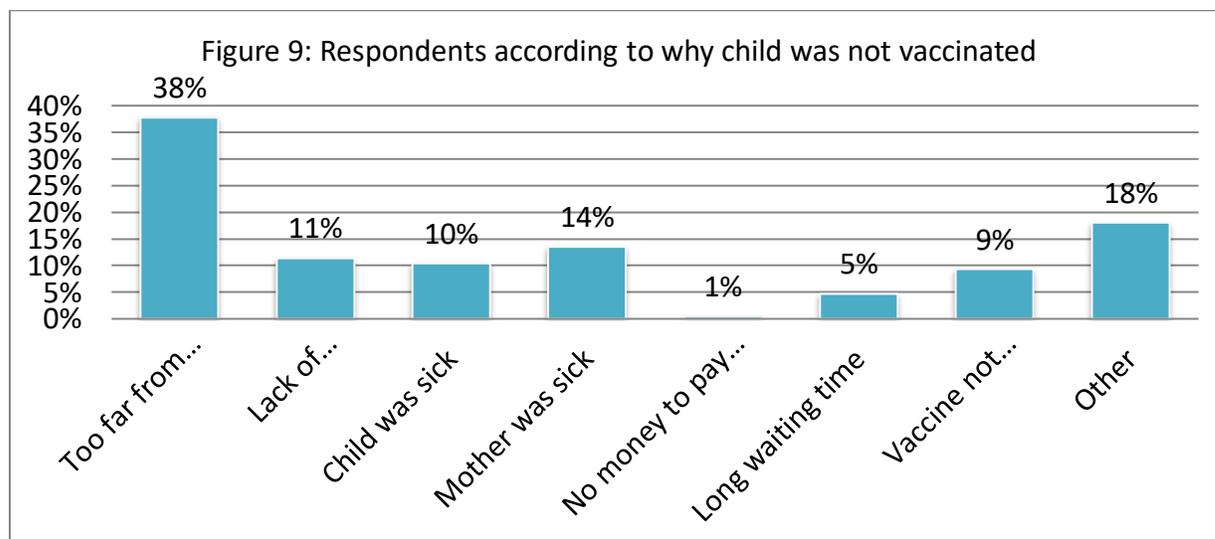
Table 5 Respondents according to whether their child completed vaccination according to schedule.

County	Total	Percent	Yes (fully immunized)	Percent	No (Defaulted)	Percent
Bomi	86	100	70	81.4	16	18.6
Bong	344	100	281	81.7	63	18.3
Gbarpolu	86	100	81	94.2	5	5.8
Grand Bassa	252	100	93	36.9	159	63.1
Grand Cape Mt	147	100	109	74.1	38	25.9
Grand Gedeh	178	100	149	83.7	29	16.3
Grand Kru	50	100	15	30.0	35	70.0

<i>Lofa</i>	329	100	257	78.1	72	21.9
<i>Margibi</i>	249	100	158	63.5	91	36.5
<i>Maryland</i>	123	100	64	52.0	59	48.0
<i>Montserrado</i>	1,428	100	1,112	77.9	316	22.1
<i>Nimba</i>	450	100	191	42.4	259	57.6
<i>Rivercess</i>	88	100	70	79.5	18	20.5
<i>River Gee</i>	70	100	39	55.7	31	44.3
<i>Sinoe</i>	116	100	92	79.3	24	20.7
Total	3,996	100	2,781	69.6	1,215	30.4

Respondents were probed further on reasons why their child was not vaccinated. Little over one-third (38%) of the respondents mentioned distance from vaccination sites as their impediment. The second major reason was the inability of mothers to take their children for vaccination because of illness (14%).

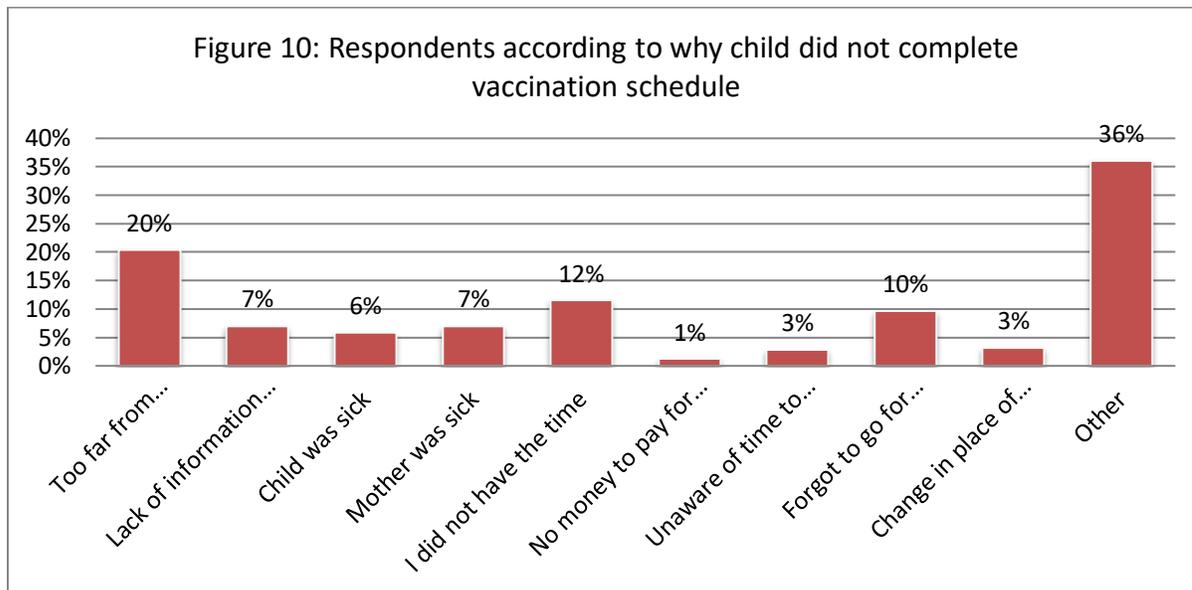
Figure 9 Respondents according to why child was not vaccinated



In the quest to establish factors hindering children from completing their vaccination schedule, the survey results revealed that distance from the vaccination site (20%) was the main reason. Other reasons mentioned were lack of time (12%), forgot about return date (10%), mother illness (7%) and

lack of information about vaccine. Figure 10 depicts reasons why children did not complete vaccination schedule.

Figure 10 Respondents according to why child did not complete vaccination schedule



The survey also assessed childhood immunization status according to vaccination card and history. Results from the survey revealed that over one-third of the immunization status of children were based on history. This reaffirms the low retention of vaccination card by mothers and caregivers. Table xx presents childhood vaccination status according to card or history.

Table 6 Childhood Vaccination status according to card or history				
Antigens	Vaccination Card		History	
	Number	Percent	Number	Percent
BCG (at birth)	2,369	61%	1,507	39%
OPVO (at birth)	2,302	61%	1,503	40%
OPV1 (6 weeks)	1,727	57%	1,294	43%
OPV2 (10 weeks)	1,300	56%	1,027	44%
OPV3 (14 weeks)	1,100	54%	926	46%
Penta 1 (6 weeks)	1,696	58%	1,242	42%

<i>Penta 2 (10 weeks)</i>	<i>1,268</i>	<i>56%</i>	<i>1,004</i>	<i>44%</i>
<i>Penta 3 (14 weeks)</i>	<i>1,062</i>	<i>54%</i>	<i>910</i>	<i>46%</i>
<i>Pneumo 1 (6 weeks)</i>	<i>1,660</i>	<i>57%</i>	<i>1,246</i>	<i>43%</i>
<i>Pneumo 2 (10 weeks)</i>	<i>1,242</i>	<i>55%</i>	<i>1,003</i>	<i>45%</i>
<i>Pneumo 3 (14 weeks)</i>	<i>1,039</i>	<i>53%</i>	<i>910</i>	<i>47%</i>
<i>Rota 1 (6 weeks)</i>	<i>1,321</i>	<i>53%</i>	<i>1,170</i>	<i>47%</i>
<i>Rota 2 (10 weeks)</i>	<i>932</i>	<i>50%</i>	<i>926</i>	<i>50%</i>
<i>Measles (9 months)</i>	<i>641</i>	<i>48%</i>	<i>700</i>	<i>52%</i>
<i>Yellow fever (9 months)</i>	<i>621</i>	<i>48%</i>	<i>676</i>	<i>52%</i>
<i>Vitamin A (Blue) 6 months</i>	<i>329</i>	<i>36%</i>	<i>584</i>	<i>64%</i>
<i>Vitamin A (Red) 6 months</i>	<i>185</i>	<i>26%</i>	<i>518</i>	<i>74%</i>

Decision to Vaccinate Children

Respondents were questioned about who makes the decision for a child to get immunized. The survey result indicates that mothers (74.1%) made most of the immunization decisions. Only 9.9% of male respondents made immunization decision and 11.9% of the respondents said both males and females made the immunization decision. There were little disparities between mothers in rural (79%) and urban (81.7%) areas regarding decision-making.

Side Effects of Childhood Vaccine

Childhood immunization side effects are usually mild and only occur in a few patients. However, vaccines, like all medicines, are capable of causing serious side effects, but these serious adverse events are extremely rare. The risk of these adverse effects is much lower than the benefit that the vaccines (immunizations) provides.

The most common immunization side effects are generally mild and self-limiting, which means they are not serious and they go away by themselves. The include:

- Local redness or swelling at the site of the injection;*

- *Fever*-most fevers are mild but in occasional cases, the fever can be accompanied by seizures such as this are benign although they are very scary at the time;
- *Crying* a bit more than usual;
- *Poor appetite*; and
- *Rash* - often seen a week to days

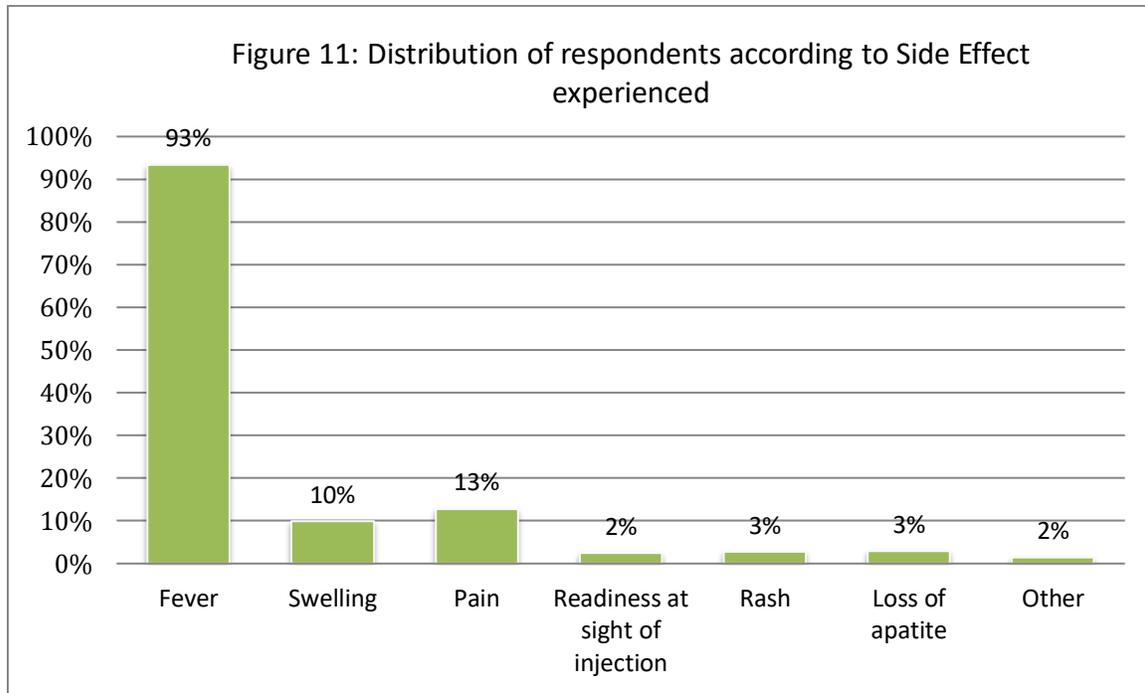
Serious Immunization side effects are not common and do not usually cause any lasting damage or illness. They include:

- *Allergic reactions*-the most severe type of allergic reaction is an anaphylactic reaction and this usually occurs within 30 minutes of having the injection;
- *Hypotonic Hypo-responsive Episodes (HHE)*-these are when the baby becomes pale floppy and very responsive;
- *Serum sickness*- is a type of hypersensitivity reaction that causes a rash, fever and sore joints and can occur days after the vaccination.

Apart from respondents' knowledge about vaccine side effect that children experienced, they were asked whether they have seen vaccine side effect. The survey findings revealed that 14.9% (n=594) saw or encountered vaccine side effect, 83.7% (n=3,321) did not see any side effect and 2% (n=81) couldn't remember child having side effect.

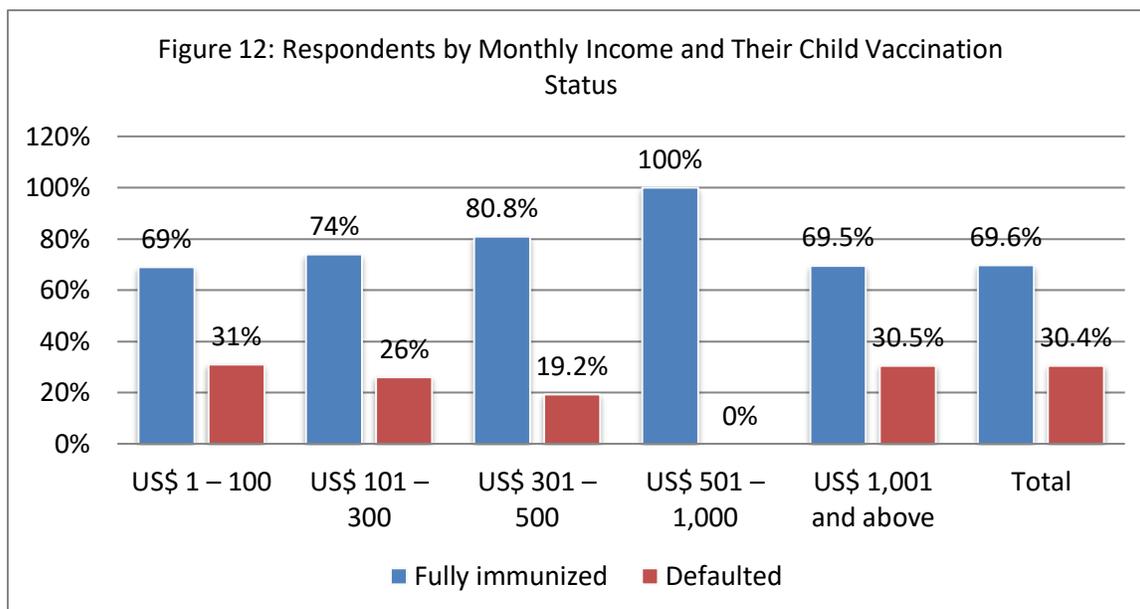
The survey probed further and asked whether side effects were harmful. The survey found out that 94.9% (n=3,974) said no and 5.1% (n=214) indicated yes. Most of the respondents were said side effects were harmful provided reasons such as " I get worried for my child (43%), my child don't sleep well (52%) and others (5%)". Figure 11 depicts the vaccines side effects according to respondents.

Figure 11 Vaccines Side Effects according to respondents



Parental income is a strong determinant of child's health. The survey asked respondents' about their monthly income and found out parents with high monthly income child were most likely to have their children fully immunized than those with parents in the lowest income bracket. Figure 12 presents respondents by monthly income bracket.

Figure 12 Respondents by monthly income and their child vaccination status



3.5 Antenatal Vaccination (Tetanus Toxoid)

Antenatal care (ANC) is the care women receive from healthcare professionals during pregnancy. The World Health Organization (WHO) has issued a new series of recommendations to improve the quality of antenatal care that will reduce the risk of stillbirths, pregnancy complications and give women positive pregnancy experience. It seeks to ensure not only a healthy pregnancy for mother and baby but also an effective transition to positive labour and childbirth and ultimately to a positive experience of motherhood.

At first ANC visit, pregnant women receive information about:

- Folic acid and vitamin D supplements;*
- Nutrition, diet and food hygiene;*
- Lifestyle factors that may affect the health of the pregnant women or the health of her baby, such as smoking, recreational drug use and drinking of alcohol;*
- Antenatal screening tests; and*
- Immunization (e.g.; TT)*

Tetanus vaccine, also known as tetanus toxoid (TT), is an inactive vaccine used to prevent tetanus. Tetanus vaccine, for intramuscular or subcutaneous use, is a sterile solution of toxoid in isotonic sodium chloride solution. The vaccine is clear or slightly turbid in appearance.

The emphasis in the KAP survey was not the full package of ANC services offer to pregnant women but their knowledge about tetanus toxoid (TT) vaccine and experience.

3.3.1 Awareness and Knowledge about TT Vaccination

The survey asked respondents about their TT knowledge. The KAP result revealed that 69.2% knew what was TT vaccine. Counties reporting the lowest knowledge of the vaccine were River Gee (35.2%), Maryland (36%) and Grand Kru (39.3%). Table 7 shows the distribution of respondents by county according to their knowledge of TT vaccine.

<i>Table 7 Respondents' Knowledge of TT Vaccine by County</i>						
<i>County</i>	<i>Total</i>	<i>Percent</i>	<i>Yes</i>	<i>Percent</i>	<i>No</i>	<i>Percent</i>
<i>Bomi</i>	<i>90</i>	<i>100</i>	<i>87</i>	<i>96.7</i>	<i>3</i>	<i>3.3</i>
<i>Bong</i>	<i>390</i>	<i>100</i>	<i>218</i>	<i>55.9</i>	<i>172</i>	<i>44.1</i>
<i>Gbarpolu</i>	<i>90</i>	<i>100</i>	<i>83</i>	<i>92.2</i>	<i>7</i>	<i>7.8</i>
<i>Grand Bassa</i>	<i>270</i>	<i>100</i>	<i>209</i>	<i>77.4</i>	<i>61</i>	<i>22.6</i>
<i>Grand Cape Mount</i>	<i>150</i>	<i>100</i>	<i>140</i>	<i>93.3</i>	<i>10</i>	<i>6.7</i>
<i>Grand Gedeh</i>	<i>179</i>	<i>100</i>	<i>99</i>	<i>55.3</i>	<i>80</i>	<i>44.7</i>
<i>Grand Kru</i>	<i>61</i>	<i>100</i>	<i>24</i>	<i>39.3</i>	<i>37</i>	<i>60.7</i>
<i>Lofa</i>	<i>330</i>	<i>100</i>	<i>293</i>	<i>88.8</i>	<i>37</i>	<i>11.2</i>
<i>Margibi</i>	<i>270</i>	<i>100</i>	<i>174</i>	<i>64.4</i>	<i>96</i>	<i>35.6</i>
<i>Maryland</i>	<i>150</i>	<i>100</i>	<i>54</i>	<i>36.0</i>	<i>96</i>	<i>64.0</i>
<i>Montserrado</i>	<i>1,489</i>	<i>100</i>	<i>1,057</i>	<i>71.0</i>	<i>432</i>	<i>29.0</i>
<i>Nimba</i>	<i>539</i>	<i>100</i>	<i>363</i>	<i>67.3</i>	<i>176</i>	<i>32.7</i>
<i>Rivercess</i>	<i>90</i>	<i>100</i>	<i>56</i>	<i>62.2</i>	<i>34</i>	<i>37.8</i>

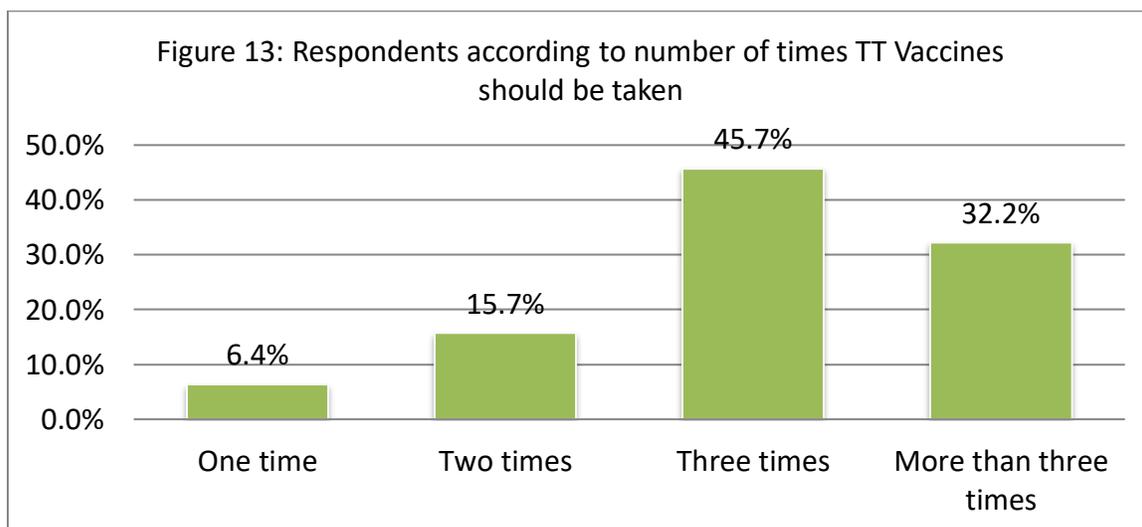
<i>River Gee</i>	91	100	32	35.2	59	64.8
<i>Sinoe</i>	117	100	89	76.1	28	23.9
Total	4,306	100	2,978	69.2	1,328	30.8

The survey asked respondents about what disease or condition TT vaccine prevents. Over 99% of the respondents said the vaccine prevents mother from tetanus and neonates from neonatal tetanus and meningitis.

Regarding the administration of the vaccine, 88.2% of the respondents said during pregnancy, while 5.3% indicated anytime and 5% did not know the right time to get the vaccine. A small proportion (1.5%) of those interviewed give other times for the administration of the vaccine.

Regarding how many times the vaccine should be taken, nearly half (45.7%) of the respondents indicated three times, 32.2% said more than three times and 15.7% mentioned two times. Figure 13 below depicts the number of times TT vaccine should be taken according to respondents.

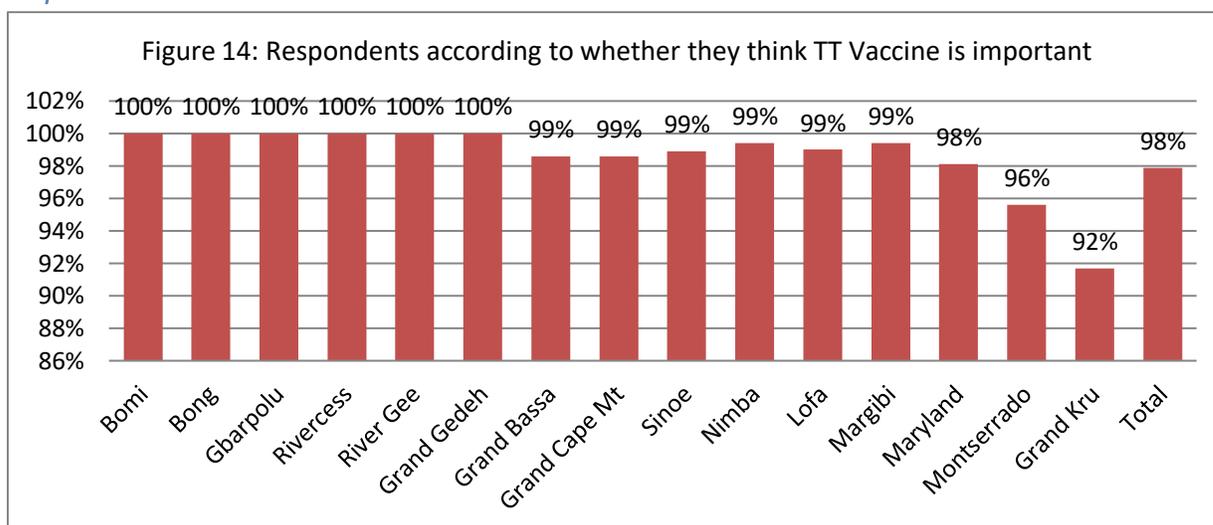
Figure 13 Respondents according to number of times TT vaccines should be taken



The majority (96.5%) of the respondents perceived the vaccine to be good for their health. On the other hand, less than 1% believes the vaccine is bad

and 2.7% were uncertain about the goodness of the vaccine. Generally, respondents agreed that TT vaccine is important for not only their health but also the unborn child. Figure 14 shows respondents according to whether they think TT vaccine is important.

Figure 14 Respondents according to whether they think TT vaccine is important



3.3.2 Practice of Respondents Towards TT Vaccination

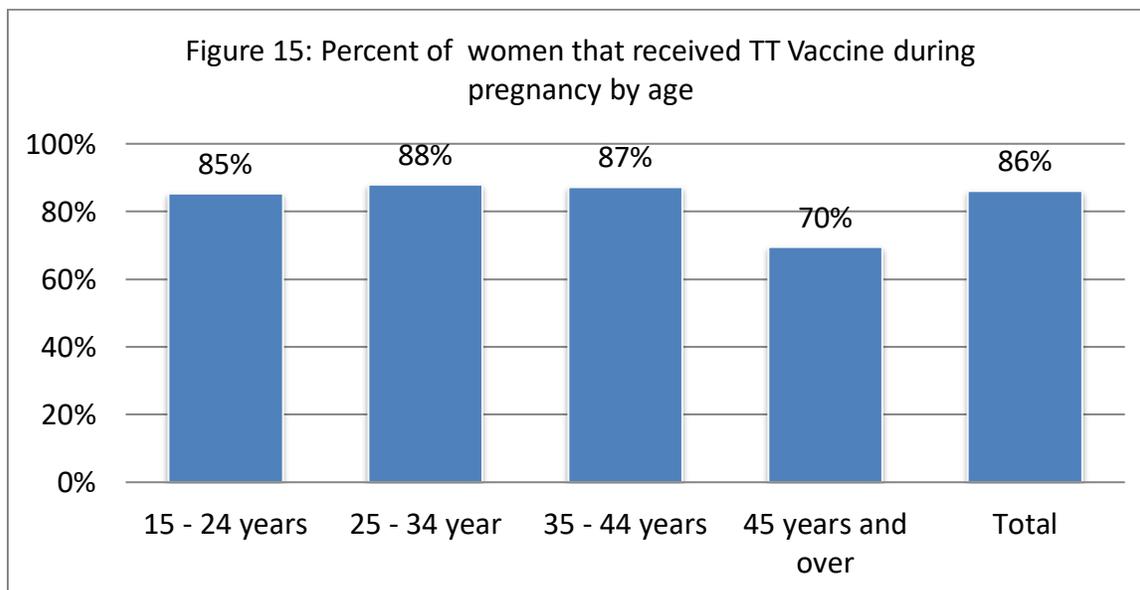
A total of 2,569 women were surveyed and 86% received TT vaccine while pregnant. Table xx shows the distribution of female respondents by their TT vaccine status when they were pregnant.

County	Total	Percent	Yes	Percent	No	Percent
Bomi	67	100	61	91.0	6	9.0
Bong	213	100	188	88.3	25	11.7
Gbarpolu	56	100	45	80.4	11	19.6
Grand Bassa	151	100	124	82.1	27	17.9
Grand Cape Mount	107	100	89	83.2	18	16.8
Grand Gedeh	95	100	91	95.8	4	4.2
Grand Kru	30	100	19	63.3	11	36.7

<i>Lofa</i>	191	100	184	96.3	7	3.7
<i>Margibi</i>	160	100	130	81.3	30	18.8
<i>Maryland</i>	76	100	57	75.0	19	25.0
<i>Montserrado</i>	923	100	803	87.0	120	13.0
<i>Nimba</i>	352	100	286	81.3	66	18.8
<i>Rivercess</i>	43	100	34	79.1	9	20.9
<i>River Gee</i>	47	100	44	93.6	3	6.4
<i>Sinoe</i>	58	100	55	94.8	3	5.2
Total	2,569	100	2,210	86.0	359	14.0

Women were disaggregated by age regarding those that received TT vaccine while pregnant. Interestingly, the age group that receive the lowest TT vaccine during pregnancy was 45 years and over. Figure 15 shows the distribution of women that received TT vaccine during pregnancy by age group.

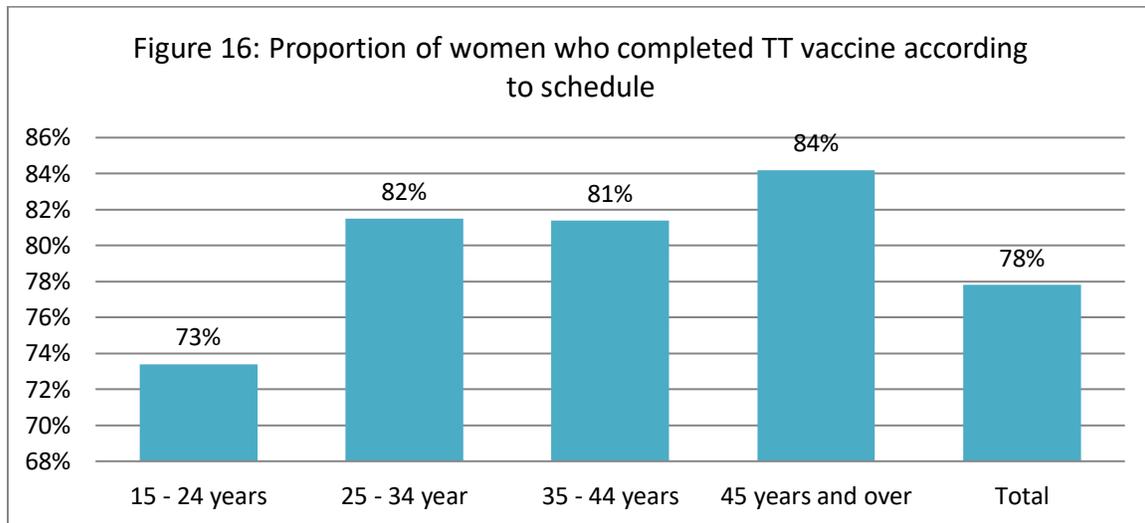
Figure 15 Percent of Women that received TT Vaccine during pregnancy by age



Female respondents were asked whether they have completed their vaccination according to schedule. The survey revealed that 78% of women took their TT

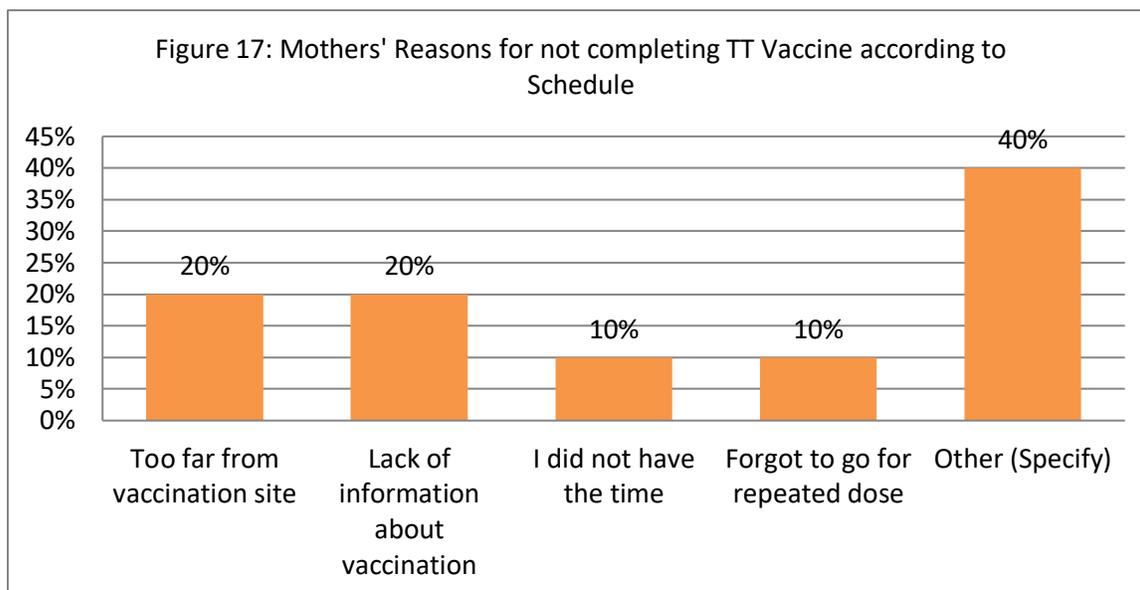
vaccine according to schedule. However, 84% of women 45 years and over received theirs on time compare to 73% of women 15 - 24 years. Figure 16 shows the proportion of women who completed TT vaccine according to schedule.

Figure 16 Proportion of Women who completed TT Vaccine according to schedule



Mothers were asked why they did not complete their vaccination on scheduled. Almost one-quarter (20%) of mothers mentioned distance from health facility and lack of information as the main reasons for not completing their vaccination according to schedule. Figure 17 depicts mothers' reasons for not completing TT vaccine according to schedule.

Figure 17 Mothers' reasons for not completing TT Vaccine according to Schedule

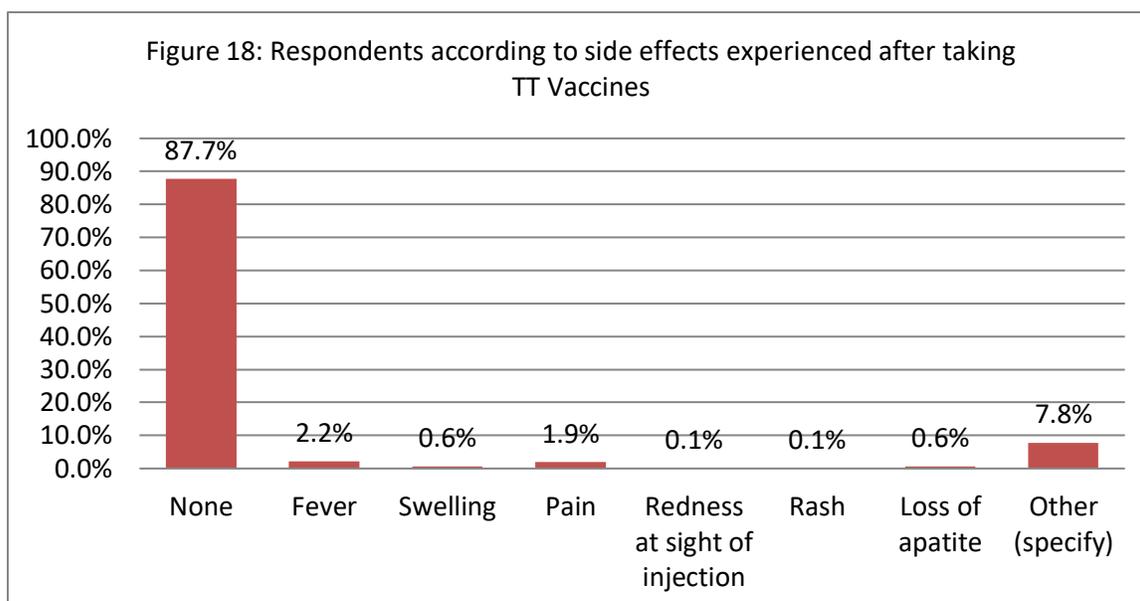


Side Effects of TT Vaccine

TT vaccine adverse reactions may be local and include redness, warmth, edema, induration with or without tenderness as well as urticarial, rash, malaise transient fever, pain, hypotension, nausea, and arthralgia may develop in some patients after the injection.

The survey further asked women whether they experienced side effect after taking TT vaccines. The result shows 87.7% had no side effect and only 12% experienced different types of side effect that include fever (2.2%), pains (1.9%), among others. However, health workers informed 69% of the respondents of TT vaccine side effect during the vaccine administration. Figure 18 presents respondents according to side effect encountered after receiving TT vaccination.

Figure 18 Respondents according to side effects experienced after taking TT Vaccines



During the survey, women were asked the prefer time to take the TT vaccine. The majority of the respondents (81.8%) indicated during pregnancy. Table 8 presents respondents according to when they prefer to take TT vaccine.

Table 8 Respondents according to when do they prefer to take TT vaccine								
County	Total	Percent	During pregnancy	Percentage	According to schedule	Percentage	Other (specify)	Percentage
Bomi	87	100	68	78.2%	11	12.6%	8	9.2%
Bong	218	100	190	87.2%	22	10.1%	6	2.8%
Gbarpolu	83	100	77	92.8%	1	1.2%	5	6.0%
Grand Bassa	209	100	147	70.3%	56	26.8%	6	2.9%
Grand Cape Mt	140	100	123	87.9%	8	5.7%	9	6.4%
Grand Gedeh	99	100	78	78.8%	5	5.1%	16	16.2%
Grand Kru	24	100	20	83.3%	1	4.2%	3	12.5%
Lofa	293	100	220	75.1%	48	16.4%	25	8.5%
Margibi	174	100	136	78.2%	34	19.5%	4	2.3%

<i>Maryland</i>	54	100	50	92.6%	3	5.6%	1	1.9%
<i>Montserrat</i>	1,057	100	829	78.4%	113	10.7%	115	10.9%
<i>Nimba</i>	363	100	340	93.7%	3	0.8%	20	5.5%
<i>Rivercess</i>	56	100	47	83.9%	2	3.6%	7	12.5%
<i>River Gee</i>	32	100	32	100.0%	0	-	0	-
<i>Sinoe</i>	89	100	79	88.8%	2	2.2%	8	9.0%
Total	2,978	100	2,436	81.8%	309	10.4%	233	7.8%

3.6 Ebola Vaccine

In 2014, Liberia, Sierra Leone and Guinea were affected by Ebola outbreak that was catastrophic and exposed the weaknesses and vulnerabilities of their health systems. Liberia was highly hit and experienced the highest death toll. However, one good thing that emerged from the outbreak was the development of an Ebola vaccine.

In December 2016, the Lancet published results of the WHO-led Guinea ring vaccination trial, showing that the world's first Ebola vaccine provides substantial protection. Among more than 11,000 people who were vaccinated in the trial, no cases of Ebola virus disease occurred.

The experiment of the EVD vaccine is creating challenges for the administration routine vaccines. This is due to the misconception associated with the EVD vaccine as it is rumored that the will infect receivers and lead to infection. The EVD vaccine has been stigmatized because of this rumor and public education and knowledge is require to improve uptake and utilization of both vaccines (EVD and Routine).

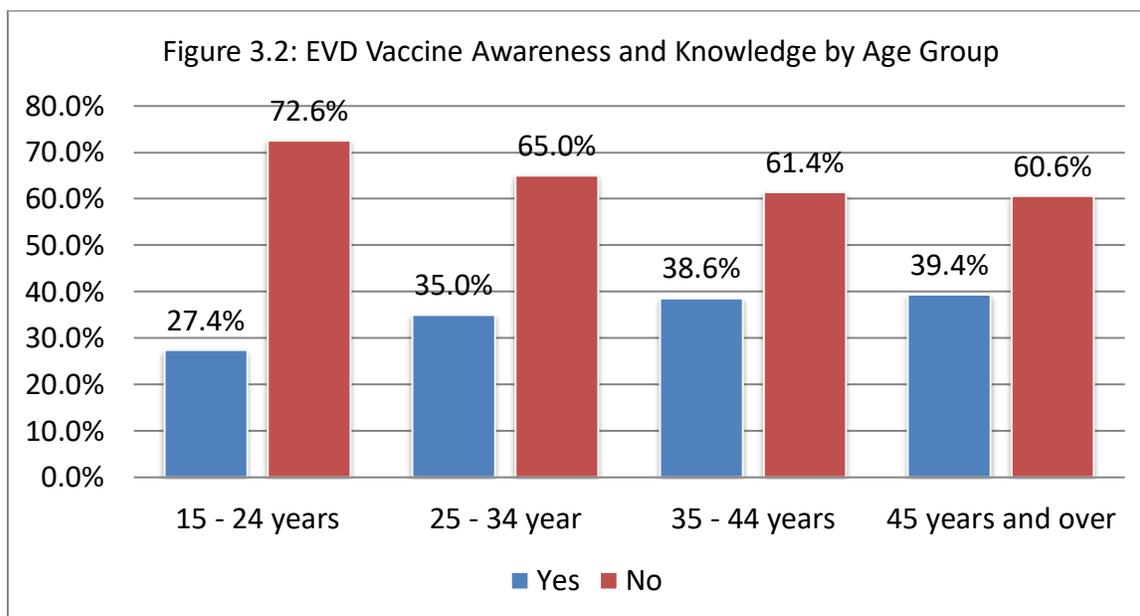
3.4.1 Awareness and Knowledge about the Ebola Vaccine

The KAP survey asked respondents about the Ebola vaccine to ascertain whether information and knowledge is universal. Unfortunately, the survey revealed that only one-third (33.1%) of the respondents (n=4,306) was aware of the EVD vaccine. Table 9 presents distribution of respondents by county according to whether they have heard of EVD vaccine.

Table 9 Have you heard about the Ebola Vaccine?						
County	Total	Percent	Yes	Percent	No	Percent
Bomi	90	100	39	43.3	51	56.7
Bong	390	100	100	25.6	290	74.4
Gbarpolu	90	100	45	50.0	45	50.0
Grand Bassa	270	100	93	34.4	177	65.6
Grand Cape Mt	150	100	50	33.3	100	66.7
Grand Gedeh	179	100	35	19.6	144	80.4
Grand Kru	61	100	18	29.5	43	70.5
Lofa	330	100	72	21.8	258	78.2
Margibi	270	100	71	26.3	199	73.7
Maryland	150	100	34	22.7	116	77.3
Montserrado	1,489	100	609	40.9	880	59.1
Nimba	539	100	171	31.7	368	68.3
Rivercess	90	100	33	36.7	57	63.3
River Gee	91	100	18	19.8	73	80.2
Sinoe	117	100	36	30.8	81	69.2
Total	4,306	100	1,424	33.1	2,882	66.9

The survey results show little difference between male (35.7%) and female (31.3%) knowledge about the vaccine. Overall, two-third of both male (64.3%) and female (68.7%) are unaware of EVD vaccine in the country. Similarly, there is no significant difference across ages and place of residence. Only 41.2% of urban respondents were knowledgeable compare to 28.9% rural dwellers. Figure 19 presents EVD awareness and knowledge by age group.

Figure 19 EVD Vaccine Awareness and Knowledge by Age Group



Apart from gathering information from respondents on EVD vaccine awareness and knowledge, the survey asked what did they hear about the vaccine or what knowledge was acquired from the vaccine publicity. Majority (73%) of the respondents said it prevents an individual from acquiring Ebola. Table 10 shows responses from those interviewed.

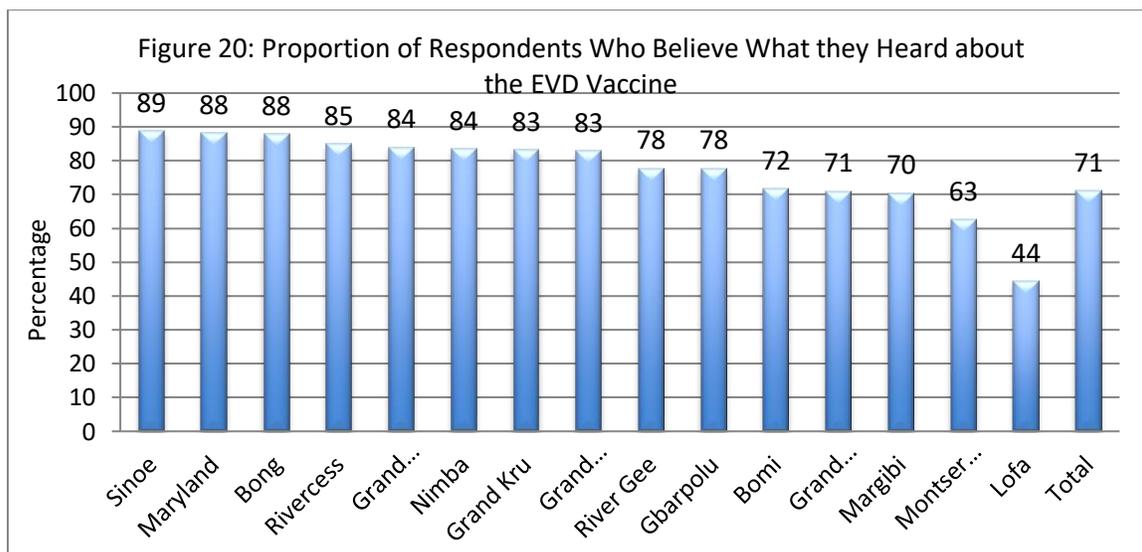
Table 10 Respondent responses according to what they heard the EVD Vaccine can do

County	Prevents me from Ebola	Cure anyone with Ebola	Lead to infertility	Don't know	Other Specific
Bomi	49%	5%	-	36%	10%
Bong	73%	14%	1%	13%	2%
Gbarpolu	73%	-	2%	16%	9%
Grand Bassa	56%	5%	-	33%	7%
Grand Cape Mt	62%	4%	-	22%	12%

<i>Grand Gedeh</i>	<i>80%</i>	<i>20%</i>	<i>-</i>	<i>6%</i>	<i>-</i>
<i>Grand Kru</i>	<i>67%</i>	<i>28%</i>	<i>-</i>	<i>6%</i>	<i>-</i>
<i>Lofa</i>	<i>72%</i>	<i>24%</i>	<i>-</i>	<i>10%</i>	<i>3%</i>
<i>Margibi</i>	<i>66%</i>	<i>13%</i>	<i>-</i>	<i>21%</i>	<i>1%</i>
<i>Maryland</i>	<i>82%</i>	<i>18%</i>	<i>-</i>	<i>-</i>	<i>-</i>
<i>Montserrado</i>	<i>78%</i>	<i>18%</i>	<i>2%</i>	<i>15%</i>	<i>3%</i>
<i>Nimba</i>	<i>75%</i>	<i>6%</i>	<i>2%</i>	<i>15%</i>	<i>2%</i>
<i>Rivercess</i>	<i>70%</i>	<i>6%</i>	<i>-</i>	<i>18%</i>	<i>6%</i>
<i>River Gee</i>	<i>78%</i>	<i>11%</i>	<i>-</i>	<i>11%</i>	<i>-</i>
<i>Sinoe</i>	<i>81%</i>	<i>17%</i>	<i>-</i>	<i>-</i>	<i>8%</i>
Total	73%	14%	1%	16%	4%

Respondents were further asked whether they believe what was said about the vaccine during the awareness campaign. Interestingly, 71% believe what they heard and one-third (29%) did not accept the public education on the EVD vaccine. Figure 20 indicates respondents according to whether they believe what they heard about the EVD vaccine.

Figure 20 Proportion of Respondents who believe what they heard about the EVD Vaccine



Sources of Ebola Vaccine Information

The KAP survey requested respondents to say where they got their information. It was revealed that most of the respondents received their knowledge from Radio (41.5%), followed by health workers in the facility (31.6%) and relatives and friends (29.7%). Television (1.8%) and schools were the lowest source of information. Table 11 in the annex presents sources of EVD vaccine awareness and knowledge.

<i>Table 11 Sources of EVD Vaccine awareness and knowledge by respondents' characteristics</i>							
<i>Characteristics</i>	<i>Radio</i>	<i>TV</i>	<i>Health Facility</i>	<i>School</i>	<i>CHWs</i>	<i>Relatives/Friends</i>	<i>Others</i>
<i>Age of respondent</i>							
<i>15 - 24 years</i>	33.3%	2.1%	35.1%	1.4%	28.6%	31.9%	1.6%
<i>25 - 34 year</i>	41.3%	1.8%	32.9%	2.7%	28.9%	31.9%	2.0%
<i>35 - 44 years</i>	50.2%	1.3%	29.0%	1.6%	24.8%	24.4%	3.3%
<i>45 years and over</i>	51.6%	2.1%	15.8%	2.1%	22.1%	23.2%	3.2%
<i>Total</i>	41.5%	1.8%	31.6%	2.0%	27.5%	29.7%	2.2%
<i>Sex of respondent</i>							
<i>Male</i>	50.3%	1.9%	25.2%	2.3%	26.6%	30.6%	3.1%
<i>Female</i>	34.7%	1.7%	36.6%	1.9%	28.1%	29.0%	1.6%
<i>Total</i>	41.5%	1.8%	31.6%	2.0%	27.5%	29.7%	2.2%
<i>Place of residence</i>							

<i>Urban</i>	47.7 %	3.0%	29.3%	1.7%	32.6 %	31.9%	3.0%
<i>Rural</i>	37.0 %	1.0%	33.3%	2.3%	23.7 %	28.1%	1.7%
<i>Total</i>	41.5%	1.8%	31.6%	2.0%	27.5 %	29.7%	2.2%

3.4.2 *Attitude Towards Ebola Vaccine*

The survey gathered additional information on the acceptability of the EVD vaccine by respondents. Little over half (57%) of the respondents said they would accept an approved EVD vaccine. Approximately one-third (32%) disapproved the EVD vaccine and 11% were not sure. Table 12 presents respondents according to whether they will accept approved EVD vaccine.

<i>Table 12 Respondents according to whether they will accept approved EVD vaccine by county</i>			
<i>County</i>	<i>Yes</i>	<i>No</i>	<i>Not Sure</i>
<i>Bomi</i>	70%	24%	6%
<i>Bong</i>	70%	15%	15%
<i>Gbarpolu</i>	73%	26%	1%
<i>Grand Bassa</i>	70%	19%	12%
<i>Grand Cape Mount</i>	63%	34%	3%
<i>Grand Gedeh</i>	72%	20%	8%
<i>Grand Kru</i>	74%	25%	2%
<i>Lofa</i>	23%	66%	12%
<i>Margibi</i>	69%	16%	15%
<i>Maryland</i>	71%	24%	5%
<i>Montserrado</i>	47%	44%	9%
<i>Nimba</i>	59%	17%	24%
<i>Rivercess</i>	76%	19%	6%
<i>River Gee</i>	64%	28%	9%

<i>Sinoe</i>	69%	26%	5%
<i>Total</i>	57%	32%	11%

The reasons stated for the disapproval of the EVD vaccine were mainly based on vaccine safety. Over half of the respondents said the vaccine was not safe (59%), it will give you EVD (15%), friends will avoid you (4%), it reduces fertility (1.5%) and 30% said they just don't want it.

Chapter 4.0 Recommendations

The KAP Survey unearthed issues that are impacting universal immunization coverage. These impediments need to be address at all levels of the health care system with concerted efforts and resources. The need for shift in some of the strategies related community awareness and sensitization cannot be overly emphasize. The following actions are suggested for implementation to improve immunization knowledge and attitude:

Immunization Awareness and Knowledge

- 1) Train community health workers to provide accurate, timely and adequate awareness on immunization services;*
- 2) Develop information package for community health workers to disseminate;*
- 3) Increase knowledge and awareness of immunization services including retention of vaccination card through radio messages;*
- 4) Develop and distribute immunization IEC materials on vaccines importance, schedule and side effects;*
- 5) Improve communication and awareness on immunization schedule.*

Immunization Attitude and Practice

- 1) Establish and communicate a clear strategy for vaccine card retention;*
- 2) Ensure that outreach services include vaccination card replacement and education;*
- 3) Support timely and quality immunization outreach to minimize default rate and unimmunized children;*
- 4) Construct additional health facilities in under served communities to improve coverage.*

References

1. Boëlle PY. Theoretical epidemiology and vaccine. *Rev Med Interne* 2007; 28: 161-5.
2. A perspective on controlling vaccine-preventable diseases among children in Liberia by RM Weeks, 1984).
3. EPI Policy and Plan
4. World Health Organization: Vaccination greatly reduces disease, disability, death and inequity worldwide <http://www.who.int/bulletin/volumes/86/2/07-040089/en/>. (Accessed: 19 January 20, 2017)
5. **LDHS 2013**
6. Ministry of Health; Infection Prevention Control (IPC) Guidelines for Vaccinators, 2014
7. Ministry of Health [Liberia]; Liberia Expanded Program on Immunization (EPI) post Ebola Recovery Plan, March 2015
8. Jheeta M, Newell J (2008) Childhood vaccination in Africa and Asia: the effects of parents' knowledge and attitudes. *Bull World Health Organ* 86: 419.
9. Siddiqi N, Siddiqi AE, Nisar N, Khan A (2010) Mothers' knowledge about EPI and its relation with age-appropriate vaccination of infants in peri-urban Karachi. *J Pak Med Assoc* 60: 940-944.
10. Kimmel SR, Burns IT, Wolfe RM, Zimmerman RK (2007) Addressing immunization barriers, benefits, and risks. *J Fam Pract* 56: S61-69.

Annex 3: Survey Questionnaire

**PUBLIC KNOWLEDGE, ATTITUDE AND PRACTICES SURVEY ON VACCINE PREVENTABLE DISEASES
IN LIBERIA: SURVEY QUESTIONNAIRE**

IDENTIFICATION	
NAME OF COUNTY	code / / /
NAME OF DISTRICT	code / / /
ENUMERATION AREA (EA).....	code..... / / /
TEAM NUMBER	/
HOUSEHOLD NUMBER.....	code / / /

INTERVIEWER			
DATE OF INTERVIEW (dd/mm/yy) / / / / / / / /			
INTERVIEWER'S NAME			
FIELD SUPERVISOR NAME:		DATA ENTRY OFFICER NAME:	
Signature		Signature	
Date / / / / / / / /		Date / / / / / / / /	

A. SOCIO-DEMOGRAPHIC SECTION: Respondent and Child				
A.1	Age of participant (In completed years)		(my /) / /	
A.2	Sex of participant	Male	1	
		Female	2	
A.3	Age of youngest child in completed years		(my /) / /	
A.4	Sex of youngest child	Male	1	
		Female	2	
A.6	Marital status (circle one answer)	Single/never married	1	
		Legally married and living with spouse/husband	2	
		Married but separated by work	3	
		Cohabiting	4	

		Separated	5	
		Divorced	6	
		Widowed	7	
		No response	8	
A.7	Religion (circle one answer). If respondent answers more than one religion, please specify under 'Other'.	Christianity	1	
		Islam	2	
		Traditional	3	
		No religion	4	
		Other (specify):	5	
		No response	6	
A.8	What is the highest educational level completed? (circle one answer)	No formal education	1	
		Elementary (1 - 6)	2	
		Junior High (7 - 9)	3	
		Senior High (10 - 12)	4	
		University (Bachelor, Masters, Doctorate)	5	
		Others, specify: _____	6	
		No response	7	
A.9	What kind of work (main occupation) do you currently do?	Unemployed	1	
		Private business (excluding petty trader)	2	
		Plumber / Carpenter / Electrician/ builder	3	
		Petty Trader	4	
		Farmer	5	
		Teacher / lecturer / instructor	6	
		Public transportation driver (taxi, buses, bajaj)	7	
		Commercial motorcyclist	8	
		Medical or health professional	9	
		Other Government employee (not stated above)	10	
		Student	11	
		Other (please specify)	12	
		No response	13	
A.10	What is your personal monthly income (1USD=105 LD)?	1.00 - 100.00 USD	1	
		101 - 300.00 USD	2	
		301 - 500.00 USD	3	
		501 - 1000.00 USD	4	
		1001 and above USD	5	
A.11	Who in the household makes decisions to take	Mother or female caregiver	1	
		Father or male caregiver	2	
		Both together	3	

	the child for vaccination	Other (please specify) _____	4	
B. 1: AWARENESS AND KNOWLEDGE of RESPONDENT TOWARDS CHILDHOOD VACCINATION				
B.1.1	Have you ever heard of vaccines for children?	Yes	1	Skip to C.1.1
		No	2	
		No response	3	
B.1.2	From what sources of information have you heard about vaccines? RECORD ALL MENTIONED	Radio	1	
		TV	2	
		Clinic/Hospital/Health Center	3	
		Schools/teachers	4	
		Community health workers	5	
		Friends/relatives	6	
		Other (please specify) _____	7	
B.1.3	Please tell us the benefits of vaccination RECORD ALL MENTIONED	To prevent my child from disease	1	
		To cure my child	2	
		I don't know	3	
		Other (please specify) _____	4	
B.1.4	At what age do you think your child should start vaccinations?	Immediately after birth	1	
		At six weeks	2	
		Any time	3	
		Other (please Specify) _____	4	
B.1.5	How many times do you think your child should take vaccine?	One time	1	
		Three times	2	
		Five times	3	
		Other (please Specify) _____	4	
B.1.6	What are the childhood diseases that can be prevented by vaccine? RECORD ALL MENTIONED	Polio	1	
		Measles	2	
		Diphtheria	3	
		Neonatal tetanus	4	
		Pertussis (Cough)	5	
		TB	6	
		Tetanus	7	
		Meningitis	8	
B.1.7	Have you heard of children having problems after taking a vaccine?	Yes	1	
		No	2	Skip to B.2.1

B.1.8	What happens to the child after taking the vaccine? RECORD ALL MENTIONED	Paralyzed	1	
		Fever	2	
		Can't breathe	3	
		Swelling	4	
		Pain	5	
		Redness	6	
		Became Deaf	7	
		Other (please Specify)_____	8	
B.2.0	ATTITUDES OF RESPONDENT TOWARDS CHILDHOOD VACCINATION			
B.2.1	Do you think vaccines are important for your child?	Yes	1	Skip to B.2.3
		No	2	
B.2.2	If no, Why do you think vaccines are not important for your child	Vaccines are contraceptive	1	
		Vaccines are contaminated	2	
		Kill the fetus? or induced abortion	3	
		My religion doesn't allow it	4	
		Other (Specify)_____	5	
B.2.3	How do you think/feel about vaccinating your child?	Very useful	1	
		Useful	2	
		Not useful	3	
		Other (Please specify)_____	4	
B.2.4	Do you think completing your child's vaccination according to schedule is important?	Yes	1	Skip to B.2.6
		No	2	
		I don't know	3	
B.2.5	If yes, what is the reason (s) it is important?	That's what the Doctor says	1	
		I want my child to be protected	2	

		Other (specify)_____	3	
B.2.6	Where do you prefer to receive your child's vaccination?	Government Health Facility	1	
		Private health facility	2	
		From the Campaign	3	
		School campus	4	
		Other (Specify)_____	5	
B.2.7	Do you think the side effects of vaccines are harmful?	Yes	1	
		No	2	Skip to B.3.1
B.2.8	If yes, please tell me why you think it is harmful?	I get worried for my child	1	
		My child don't sleep well	2	
		Other (Specify)_____	3	
B.3.0	PRACTICE OF RESPONDENT TOWARDS CHILDHOOD VACCINATION			
B.3.1	Has [NAME of child] been vaccinated?	Yes	1	
		No	2	Skip to C.1.1
B.3.2	Did NAME complete his/her vaccinations according to schedule?	Yes (fully immunized)	1	
		No (Defaulted)	2	Skip to B.3.4
B.3.3	How many times did NAME receive the vaccine?	Once	1	
		Twice	2	
		Three times	3	
		Four times	4	
		More than five times	5	
		Other (Specify)_____	6	
B.3.3.1	<i>Please complete the below table (using vaccine cards or by history)</i>			

NOTE UPON COMPLETION OF TABLE B.3.3.1 ABOVE SKIP TO B.3.6

B.3.4	If no to B.3.2, Why was [name of child] not vaccinated? RECORD ALL MENTIONED	Too far from vaccination site	1	
		Lack of information about vaccination	2	
		Child was sick	3	
		Mother was sick	4	
		I did not have the time	5	
		No money to pay for vaccine	6	
		Long waiting time	7	
		Vaccine not available	8	
		Other (Specify)_____	9	
B.3.5	If no to B.3.2 Why did NAME not complete vaccination? RECORD ALL MENTIONED	Too far from vaccination site	1	
		Lack of information about vaccination	2	
		Child was sick	3	
		Mother was sick	4	
		I did not have the time	5	
		No money to pay for vaccine	6	
		Unaware of time to return for vaccine	7	
		Forgot to go for repeated dose	8	
		Change in place of vaccination site	9	
Other (Specify)_____	10			
B.3.6	Did you observe or see NAME presenting any side effect after taking the vaccine?	Yes	1	Skip to C.1.1
		No	2	
		Don't know	3	
B.3.7	If yes to B.3.6, please name the side effects of the vaccine (Select all that apply)	Fever	1	
		Swelling	2	
		Pain	3	
		Readiness at sight of injection	4	
		Rash	5	

		Loss of apatite	6	
		Other (specify)_____	7	
C.1.0	AWARENESS AND KNOWLEDGE TOWARDS ANTENATAL VACCINATION			
C.1.1	Do you know about antenatal vaccination of mothers?	Yes	1	
		No	2	
C.1.2	What disease (s) antenatal vaccination prevents? (Select all that applied)	Prevent mother from tetanus	1	
		Prevent Neonatal tetanus	2	
		Meningitis	3	
		Don't know	4	
		Other (Specify)_____	5	
C.1.3	When do you usually start your antenatal vaccination?	Anytime	1	
		During pregnancy	2	
		Other (Specify)_____	3	
		Don't know	4	
C.1.4	How many times do you think a mother should take vaccine?	One time	1	
		Two time	2	
		Three time	3	
		More than three times	4	
C.2.0	ATTITUDES OF RESPONDENT TOWARDS ANTENATAL VACCINATION			
C.2.1	Do you think antenatal vaccines are important for you (if female)/ mothers (if male)?	Yes	1	Skip to C.2.3
		No	2	
C.2.2	If no, Why do you think antenatal vaccines are not important for you/mothers?	Vaccines are contraceptive	1	
		Vaccine are contaminated	2	
		Kill the event or induced abortion	3	
		My religion don't allow it	4	

		Other (Specify)_____	5	
C.2.3	How do you think/feel about vaccinating yourself/mothers?	Very useful		
		Useful		
		Not useful		
		Other (Please specify)_____		
C.2.4	Do you think completing antenatal vaccination according to schedule is important for you/ mothers and your child?	Yes	1	Skip to C.2.6
		No	2	
		I don't know	3	
C.2.5	If yes, what are the reason (s)	That's what the Doctor says	1	
		To protect myself	2	
		To protect my child	3	
		Other (specify)_____		
C.2.6	When do you (or mother of your child)prefer to take antenatal vaccine?	During pregnancy	1	
		According to schedule	2	
		Other (specify)_____	3	
C.2.7	Where do you (or mother of your child) prefer to receive your (her) antenatal vaccination?	Government Health Facility	1	
		Private health facility	2	
		From the Campaign	3	
		School campus	4	
		Other (Specify)_____	5	
C.3.0	PRACTICE OF MOTHERS TOWARDS ANTENATAL VACCINATION			
C.3.1	Did you/child's mother receive your/her TT vaccine during pregnancy?	Yes	1	Skip to C.3.3
		No	2	
C.3.2		Yes	1	C.3.4

	Have you/your child's mother completed your/her TT vaccine according to schedule?	No	2	
C.3.3	Why you/she did not complete your/her TT vaccination? RECORD ALL MENTIONED	Too far from vaccination site	1	
		Lack of information about vaccination	2	
		Child was sick	3	
		Mother was sick	4	
		I did not have the time	5	
		No money to pay for vaccine	6	
		Unaware of time to return for vaccine	7	
		Forgot to go for repeated dose	8	
		Change in place of vaccination site	9	
		Other (Specify)_____	10	
C.3.4	How many times did you/she receive the TT vaccine? (Verify using vaccination card)	Once	1	
		Twice	2	
		Three times	3	
		Four times	4	
		More than five times	5	
		Other (Specify)_____	6	
C.3.5	What were the side effect (s) you/she observed after taking the TT vaccine (select all that applied)	None	1	
		Fever	2	
		Swelling	3	
		Pain	4	
		Readiness at sight of injection	5	
		Rash	6	
		Loss of apatite	7	
		Other (specify)_____	8	

C.3.6	Did the health provider tell you/her about the important/side effect of the vaccine?	Yes	1	
		No	2	
D 4. 0 Finally, I will like to ask you Few Questions about Ebola Vaccine				
D4.1	Have you heard about the Ebola vaccine?	Yes	1	
		No	2	
D4.2	IF YES: What have you heard the vaccine can do (select all that all that apply)?	Prevent Ebola	1	
		Cure anyone with Ebola	2	
		Lead to infertility	3	
		Don't know	4	
		Other Specific _____	5	
D4.3	Where did you get your information (Select all that apply)?	Radio	1	
		TV	2	
		Clinic/Hospital/Health Center	3	
		Schools/teachers	4	
		Community health workers	5	
		Friends/relatives	6	
		Other (please specify) _____	7	
D4.4	Do you believe what you heard?	Yes	1	
		No	2	
D4.5	If no why so?	Ebola vaccine is not safe	1	
		It reduces fertility	2	
		It will give us Ebola	3	
		I don't just know	4	
D4.6	If there was an approved vaccine that could prevent Ebola, would you	Yes	1	
		No	2	
		Not sure/ don't know	3	

	accept it for yourself and your family?	No response	4
D4.7	If no to D4.6, why?	Ebola vaccine is not safe	1
		It reduces fertility	2
		It will give us Ebola	3
		Our friends will avoid us	4
		I don't just know	5

Annex 4. Focus Group Discussion Guide

Focus Group Discussion: Intro

Good morning/afternoon, and thank you all for coming. My name is _____ and these are my colleagues ____ and _____. We are working with the Ministry of Health. We are conducting several meetings with people like you to find out how you feel about immunization and related health issues concerning children aged <2 years and their parents or caregivers. We will be talking to groups of men and women. 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.

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.

Note to the moderator: Moderators should pay attention to the mood of the group, and ask questions about respondents' personal opinions and practices as much as possible with phrases like "How about you?".

Knowledge Attitudes and Practice on Immunization in Liberia (FGDs)

IDENTIFICATION	
NAME OF COUNTY	code / / / /
NAME OF DISTRICT	code / / / /
NAME OF CLAN/TOWNSHIP	code / / / / /
ENUMERATION AREA (EA).....	code..... / / / / /

FACILITATOR					
DATE OF INTERVIEW (dd/mm/yy) / / / / / / / / /					
SUPERVISOR/FACILITATOR NAME:		NOTE TAKER #1 NAME:		NOTE TAKER #2 NAME::	
Signature		Signature		Signature	
Date	/ / / / / / / / /	Date	/ / / / / / / / /	Date	/ / / / / / / / /

Opening Question: *(Ice breaker)* When you think of immunization/vaccination, what are some of the things that come to mind right away? Let’s have each person just say a word or two, the first thought that comes to your mind. Thanks. Now I would like to turn our conversation to the topic that we are here to discuss today/tonight – childhood and antenatal immunizations.

Key Questions:

KNOWLEDGE, ATTITUDE & BELIEFS ABOUT IMMUNIZATION

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 and mothers are immunized?
 - c. What are the local names for these diseases?

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 (1st, - 5th)
 - b. What do you think the child gets each time?
 - c. By what age should a child have completed the five immunization doses?
 How many time should the child’s mother be immunized?

2. How effective do you think that the recommended vaccines generally are at preventing childhood diseases (such as polio, measles, mumps, chicken pox, whooping cough or tetanus)
3. What do you think are reasons for children in this community not to complete their vaccine?
What reason can you give for the mothers not to complete their antenatal vaccine?
4. Do you know of any side effects might result from immunization?

Probe: (For the child and mother)

- a) What are they?
- b) What did you do about the side effect?

5. In this community, what are your sources of information about immunization?

Probe:

- a) *Who tells you about routine immunization?*
- b) *Who tells you about NIDs?*
- c) *Who tells you about antenatal immunization?*

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

Probe:

7. In this community, where do parents or caregivers take their children for routine immunization? Is it far? Is it near? Is it in a health facility? Is it an outreach unit?

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

9. In your opinion, do health providers advise caretakers about the possible side effects of immunization?

Probe:

10.

PERCEPTIONS OF THE EBOLA VACCINE

1. Have you heard about the Ebola vaccine? IF YES: What have you heard about?

2. Where did you get your information?
PROBE: ASK IF THEY BELIEVE WHAT THEY HEARD AND WHY OR WHY NOT?

3. What about others in the community? What do they think?

4. What do you think the government of Liberia should do about the Ebola vaccine?

5. If Ebola vaccine were offered to you as part of a clinical trial or during outbreak response, would you accept it?
 - a. If yes, why?
 - b. If no, why not?

6. If Ebola vaccine were being given to people in your community for purposes of a clinical trial or for outbreak response, would it prevent you from getting your child immunized with childhood vaccines? If yes, why?

7. Similarly, if Ebola vaccine were being given to people in your community for these purposes, would it prevent you/your female partner from getting routine antenatal vaccines? If yes, why?

Continue ONLY IN THE MALES FGDS

11. Do your wives have to ask for permission from you or any other family member when they take the children for immunization? In what situation do they ask for this permission?

12. In your opinion, what contribution can fathers make towards successful routine immunizations in this community?

13. What resources do you have in this community that will enable you to inform caretakers to emphasize the importance and the need to take their children for routine immunization?

Annex 5. Key Informant Interview (KII)

To be conducted among Health Professionals

Good morning/afternoon, and thank you all for coming. My name is _____ and this are my colleagues ____ and _____. We are working with the Ministry of Health. We are conducting several meetings with people like you to find out how you feel about immunization and related health issues concerning children aged < 2 years and their parents or caregivers. We will be talking to groups of men and women. 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

Your answers will remain confidential and anonymous. Your answers will help us plan programs for your area.

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.

Note to the moderator: Moderators should pay attention to the mood of the group, and ask questions about respondents' personal opinions and practices as much as possible with phrases like "How about you?".

IDENTIFICATION

NAME OF COUNTY	code	/	/	/
NAME OF DISTRICT	code	/	/	/
NAME OF CLAN/TOWNSHIP	code	/	/	/
NAME OF HEALTH FACILITY.....	code.....	/	/	/

FACILITATOR					
DATE OF INTERVIEW (dd/mm/yy) / / / / / / / / / /					
SUPERVISOR/FACILITATOR NAME:		NOTE TAKER #1 NAME:		NOTE TAKER #2 NAME::	
Signature		Signature		Signature	
Date	/ / / / / / / /	Date	/ / / / / / / /	Date	/ / / / / / / /

Respondent Socio-Demographic Data

Ages: _____ Sex _____

What is your highest level of education? _____

Opening Question:

Ask the respondent his/her name, occupation, how long he/she has lived there and things she/he likes to do, etc. **SHARE SOMETHING PERSONAL ABOUT YOURSELF TOO.**

I am going to ask you some questions that are related to the work that you do as a health professor.

1. In your opinion, what do you think about immunization in this community?
Probe:
 - What local name is given to immunization in this community if any?
 - Name the diseases against which children are immunized?

2. How many times should a child be immunized during his/her first year of life in order to complete the immunization schedule? What about the mother?

3. Do you know anyone in this community who did not bring her/his child for RI or NIDs? Probe:
 - What kind of people were they? (Probe for educational status, occupation, health workers, others...?)
 - Why do you think they did not?
 - How can we convince caretakers to bring their children to start and complete their immunization schedule at the routine immunization unit (fixed or outreach)? Who will be the best person to convince the caretakers?

4. Do you know of any side effects to the child that might result from immunization?
Probe:

- Have you heard or seen any child who had a side effect from immunization? What did the child have?
 - What was done about the side effect?
 - What should be done and who should do it?
 - Do you tell caretakers that some children might have some side effects? What do you tell them about side effects?
5. How do members of this community, especially caretakers get information about immunization?
Probe:
- *Who tells caretakers about routine immunization*
 - *Who tells caretakers about NIDS*
 - *Who tells mothers about antenatal vaccination?*
 - *What do you tell them about NIDS? About routine immunization? About antenatal vaccination?*
6. What do you think would be the most effective way of informing the caretakers about routine and antenatal immunization?
7. What sources of information on immunization do you think caretakers trust most?
Probe:
8. Have you heard /seen someone in the community talking against taking children for immunizations? Probe:
- *What have you heard?*
 - *Do you think some people in the community believed them? Why do you think they believed them?*
9. What resources do you have in this community that will enable you to inform caretakers to emphasize the importance and the need to take their children for routine immunization? *(If the following structures are not mentioned, Probe: GCHVs, Youth, Women and Men group)*
10. What logistical support do you get:
- *From the health facility?*
 - *From the community you are serving?*
 - *In your opinion, what can be done to make your work more efficient?*
11. We have learnt that immunization coverage for the routine immunization has been going down since mid 90's. What do you think could be done to improve the trend?
12. What key messages about immunization do you as an OIC need to know, especially at operational level?
- *How should the messages be disseminated to other health workers like you?*
8. Have you heard about the Ebola vaccine? IF YES: What have you heard about?
9. Where did you get your information?
PROBE: ASK IF THEY BELIEVE WHAT THEY HEARD AND WHY OR WHY NOT?

10. What about others in the community? What do they think?

11. What do you think the government of Liberia should do about the Ebola vaccine?

Insert Qs about their community's perceptions about Ebola vaccine – have they heard of any vaccine hesitancy associated with or influenced by clinical trials, etc...

Wrap up the discussion: "**This has been a very interesting discussion**"

Please Clarify unclear points made by the interviewee by stating: "You said... Did I understand you correctly?" Be sure to correct any incorrect information that the interviewee may have told you during the interview.

Thank the interviewee

Appendix II: Immunization Awareness, Knowledge and Practice

Table 1: Sources of EVD Vaccine Awareness and Knowledge

<i>County</i>	<i>Radio</i>	<i>TV</i>	<i>Health Facility</i>	<i>School</i>	<i>CHWs</i>	<i>Relatives/Friends</i>	<i>Others</i>
---------------	--------------	-----------	------------------------	---------------	-------------	--------------------------	---------------

<i>Bomi</i>	35.9%	-	51.3%	-	20.5%	28.2%	-
<i>Bong</i>	24.0%	-	30.0%	-	21.0%	27.0%	8%
<i>Gbarpolu</i>	28.9%	2.2%	64.4%	-	35.6%	13.3%	-
<i>Grand Bassa</i>	58.1%	-	18.3%	1.1%	7.5%	22.6%	-
<i>Grand Cape Mt</i>	32.0%	-	50.0%	-	8.0%	28.0%	2%
<i>Grand Gedeh</i>	51.4%	2.9%	34.3%	5.7%	31.4%	25.7%	-
<i>Grand Kru</i>	50.0%	-	16.7%	-	33.3%	-	-
<i>Lofa</i>	19.4%	-	30.6%	4.2%	8.3%	48.6%	4.2%
<i>Margibi</i>	38.0%	-	8.5%	8.5%	28.2%	29.6%	-
<i>Maryland</i>	41.2%	-	20.6%	-	35.3%	11.8%	-
<i>Montserrat</i>	50.9%	3.9%	32.3%	2.5%	36.5%	32.0%	3%
<i>Nimba</i>	25.7%	-	25.1%	1.2%	21.1%	40.4%	-
<i>Rivercess</i>	27.3%	-	54.5%	-	12.1%	21.2%	3%
<i>River Gee</i>	44.4%	-	27.8%	-	22.2%	5.6%	-
<i>Sinoe</i>	47.2%	-	44.4%	-	38.9%	8.3%	2.8%
Total	41.5%	1.8%	31.6%	2%	27.5%	29.7%	2.2%

Table 2: Respondents according to whether they believe what you heard about EVD Vaccine

<i>County</i>	<i>Yes</i>	<i>No</i>
<i>Bomi</i>	72%	28%
<i>Bong</i>	88%	12%

<i>Gbarpolu</i>	<i>78%</i>	<i>22%</i>
<i>Grand Bassa</i>	<i>71%</i>	<i>29%</i>
<i>Grand Cape Mt</i>	<i>84%</i>	<i>16%</i>
<i>Grand Gedeh</i>	<i>83%</i>	<i>17%</i>
<i>Grand Kru</i>	<i>83%</i>	<i>17%</i>
<i>Lofa</i>	<i>44%</i>	<i>56%</i>
<i>Margibi</i>	<i>70%</i>	<i>30%</i>
<i>Maryland</i>	<i>88%</i>	<i>12%</i>
<i>Montserrado</i>	<i>63%</i>	<i>37%</i>
<i>Nimba</i>	<i>84%</i>	<i>16%</i>
<i>Rivercess</i>	<i>85%</i>	<i>15%</i>
<i>River Gee</i>	<i>78%</i>	<i>22%</i>
<i>Sinoe</i>	<i>89%</i>	<i>11%</i>
<i>Total</i>	<i>71%</i>	<i>29%</i>

<i>Table 3: Respondents reasons for rejecting EVD Vaccines when approved</i>					
<i>County</i>	<i>Vaccine Not Safe</i>	<i>Reduces fertility</i>	<i>It will give us EVD</i>	<i>Our Friends will avoid us</i>	<i>I Just don't know</i>
<i>Bomi</i>	<i>73%</i>	<i>-</i>	<i>5%</i>	<i>-</i>	<i>23%</i>
<i>Bong</i>	<i>53%</i>	<i>-</i>	<i>19%</i>	<i>-</i>	<i>29%</i>
<i>Gbarpolu</i>	<i>52%</i>	<i>-</i>	<i>17%</i>	<i>4%</i>	<i>26%</i>
<i>Grand Bassa</i>	<i>45%</i>	<i>-</i>	<i>20%</i>	<i>4%</i>	<i>33%</i>
<i>Grand Cape Mt</i>	<i>78%</i>	<i>-</i>	<i>4%</i>	<i>-</i>	<i>22%</i>
<i>Grand Gedeh</i>	<i>86%</i>	<i>-</i>	<i>11%</i>	<i>3%</i>	<i>-</i>
<i>Grand Kru</i>	<i>27%</i>	<i>-</i>	<i>20%</i>	<i>13%</i>	<i>40%</i>
<i>Lofa</i>	<i>42%</i>	<i>0.9%</i>	<i>15%</i>	<i>3%</i>	<i>42%</i>
<i>Margibi</i>	<i>73%</i>	<i>9.1%</i>	<i>39%</i>	<i>7%</i>	<i>9%</i>
<i>Maryland</i>	<i>42%</i>	<i>-</i>	<i>11%</i>	<i>22%</i>	<i>25%</i>

<i>Montserrado</i>	67%	1.2%	16%	4%	28%
<i>Nimba</i>	41%	7.6%	2%	-	46%
<i>Rivercess</i>	71%	-	18%	-	18%
<i>River Gee</i>	44%	-	24%	12%	20%
<i>Sinoe</i>	37%	-	13%	3%	53%
<i>Total</i>	59%	1.5%	15%	4%	30%

Table 4: Percent of women who completed their TT vaccine according to schedule

<i>County</i>	<i>Total</i>	<i>Percent</i>	<i>Yes</i>	<i>Percent</i>	<i>No</i>	<i>Percent</i>
<i>Bomi</i>	61	100	49	80.3	12	19.7
<i>Bong</i>	188	100	168	89.4	20	10.6
<i>Gbarpolu</i>	45	100	29	64.4	16	35.6
<i>Grand Bassa</i>	124	100	85	68.5	39	31.5
<i>Grand Cape Mt</i>	89	100	59	66.3	30	33.7
<i>Grand Gedeh</i>	91	100	86	94.5	5	5.5
<i>Grand Kru</i>	19	100	14	73.7	5	26.3
<i>Lofa</i>	184	100	173	94.0	11	6.0
<i>Margibi</i>	130	100	105	80.8	25	19.2
<i>Maryland</i>	57	100	42	73.7	15	26.3
<i>Montserrado</i>	803	100	654	81.4	149	18.6
<i>Nimba</i>	286	100	168	58.7	118	41.3
<i>Rivercess</i>	34	100	20	58.8	14	41.2
<i>River Gee</i>	44	100	34	77.3	10	22.7
<i>Sinoe</i>	55	100	34	61.8	21	38.2
<i>Total</i>	2,210	100	1,720	77.8	490	22.2

Table 5: Respondents according to whether health providers informed them about TT Vaccine side effect

<i>County</i>	<i>Total</i>	<i>Percent</i>	<i>Yes</i>	<i>Percent</i>	<i>No</i>	<i>Percent</i>
<i>Bomi</i>	67	100	52	77.6	15	22.4
<i>Bong</i>	213	100	171	80.3	42	19.7
<i>Gbarpolu</i>	56	100	29	51.8	27	48.2
<i>Grand Bassa</i>	151	100	84	55.6	67	44.4
<i>Grand Cape Mount</i>	107	100	62	57.9	45	42.1
<i>Grand Gedeh</i>	95	100	59	62.1	36	37.9
<i>Grand Kru</i>	30	100	11	36.7	19	63.3
<i>Lofa</i>	191	100	159	83.2	32	16.8
<i>Margibi</i>	160	100	89	55.6	71	44.4
<i>Maryland</i>	76	100	38	50.0	38	50.0
<i>Montserrado</i>	923	100	704	76.3	219	23.7
<i>Nimba</i>	352	100	222	63.1	130	36.9
<i>Rivercess</i>	43	100	32	74.4	11	25.6
<i>River Gee</i>	47	100	19	40.4	28	59.6
<i>Sinoe</i>	58	100	41	70.7	17	29.3
<i>Total</i>	2,569	100	1,772	69.0	797	31.0